CODE SWITCHING IN THE CLASSROOM OF SMA NEGERI 14 SEMARANG

A THESIS

In Partial Fulfillment of the Requirements
For Master's Degree in Linguistics

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POSTGRADUATE PROGRAM
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CERTIFICATION OF ORIGINALITY

I certify that this thesis, entitled "Code Switching in The Clasroom of SMA Negeri 14 Semarang" is original. I am completely responsible for the content of the thesis. Other writers' opinion or findings included in this thesis are quoted or cited in accordance with the ethical standard.

Semarang, June 17, 2014

Hernofika Laksmi Tatas Sulistyawati

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"Life is not about waiting for the storm to pass...

it is about learning to dance in the rain"

Dedicated to:

Naufal Yusuf Arfan Adani

Nayra Maiza Khairani

Nigar Muhammad Raffisqy

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ABSTRACT

This research is a part of the sociolinguistic studies that emphasizes on code-switching in communication, especially in teaching and learning activity in the classroom. Beside investigates the types and functions of code-switching used by chemistry teacher in the classroom, the writer also investigates the roles of code switching in teacher's emotion. The aims of this study are to reveal the types functions and roles of code-switching used by the chemistry teacher in the classroom in SMA Negeri 14 Semarang. The writer uses a qualitative approach, and observation and interview method to get the data.

The results of this study show that the chemistry teacher in grade ten of SMA Negeri 14 Semarang frequently switched her language from Indonesian to Javanese and vice versa in the classroom. There are 4 types of code-switching used by the chemistry teacher, i.e. inter sentential code-switching, intra sentential code-switching, tag code-switching and metaphorical code-switching. The functions of the code-switching used by chemistry teacher are for talking about a particular topic, for emphasizing some points, for clarifying the speech content, for providing the real lexical word, for strengthening a command, for creating friendly environment and for expressing the emotion. The function of code switching that is most frequently used by the teacher is for expressing the emotion.

The roles of code switching in teacher's emotion are for emphasizing emotion in repetition, for emphasizing emotion in embarrassment, for emphasizing emotion in disagreement, emphasizing emotion in cursing. The teacher's reason for switching her code from Indonesian to Javanese in expressing emotion is that Javanese has more word choice than Indonesian for expressing the emotion and for insulting people, the teacher's mother tongue is Javanese so she prefers to use Javanese rather than in Indonesian.

Keywords: Bilingual Community, Code-switching, Sociolinguistics.

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ABSTRAK

Penelitian ini merupakan salah satu bagian dari kajian linguistik yang menekankan alih kode dalam komunikasi terutama pada kegiatan belajar mengajar di dalam kelas. Selain meneliti tipe, fungsi alih kode yang banyak digunakan oleh guru kimia di dalam kelas, peneliti juga meneliti peran alih kode pada emosi guru yang terjadi di dalam kelas. Tujuan penelitian ini adalah untuk mengungkap tipe, fungsi, dan juga peran alih kode pada emosi guru kimia di dalam kelas di SMA Negeri 14 Semarang. Penulis menggunakan pendekatan kualitatif untuk penelitian ini dan menggunakan metode observasi dan wawancara untuk memperoleh data.

Hasil penelitian ini menunjukkan bahwa guru kimia sering menggunakan alih kode dari bahasa Indonesia ke bahasa Jawa dan sebaliknya. Ada 4 tipe alih kode yang digunakan oleh guru kimia, yaitu: alih kode antar kalimat, alih kode intra sentential, alih kode tag dan alih kode metaforis. Fungsi alih kode yang digunakan oleh guru kimia selama proses belajar mengajar adalah untuk berbicara tentang topik tertentu, untuk klarifikasi, untuk memperjelas tuturan, untuk kata leksikal nyata, dan untuk memperkuat perintah, untuk menciptakan keakraban, untuk mengekspresikan emosi. Fungsi alih kode yang paling banyak digunakan oleh guru adalah untuk mengekspresikan emosi.

Peran alih kode pada emosi guru adalah sebagai penekanan dalam pengulangan, sebagai penekanan dalam mempermalukan, sebagai penekanan dalam ketidaksetujuan, sebagai penekanan dalam memaki. Alasan guru kimia beralih kode dari bahasa Indonesia ke bahasa Jawa dalam mengekspresikan emosi karena bahasa Jawa mempunyai lebih banyak pilihan kata daripada bahasa Indonesia yang dapat digunakan untuk mengungkapkan ekspresi dan mengejek orang, bahasa ibu guru kima adalah bahasa Jawa sehingga beliau lebih suka menggunakan bahasa Jawa daripda bahasa Indonesia.

Kata kunci: Masyarakat dua bahasa, Alih kode, Sosiolinguistik

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CHAPTER I

INTRODUCTION

1.1 Background of the Study

Language is the most important tool of communication in human life. It will never be separated from human life because it is a human system which is used to communicate their ideas, feeling, desires, actions and experience for other people. In general, language refers to the human ability to learn and use systems of complex communication, or to describe the set of rules that make up these systems, or the set of utterances that can be obtained from those rules. According to Sapir (1921) language is a purely human and non-instinctive method of communicating ideas, emotions and desires by means of voluntarily produced symbols. In addition, Rodman, et al (2010) said that language is sound units that are related to specific meanings and the sounds and meanings of words are arbitrary. From various definitions above, we can conclude that language is a system for communication that uses arbitrary signals such as voice sounds, gestures, or written symbols that enable human to cooperate.

There are various functions of language in human life. According to Jakobson (1960), there are six functions of language in which each function has an associated factor, namely: the referential function, the expressive function, the conative function, the poetic function, the phatic function and

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the metalingual function. The referential function corresponds to the factor of context and describes a situation, object or mental state. It is denotative, cognitive function, which is oriented toward the facts, example: "The sun rises in the east." The expressive function or alternatively called emotive or affective function relates to the addresser. This function comes out when we want to express our emotion although we do not speak to give information. It is exemplified by interjections and other sound changes that do not alter the denotative meaning of an utterance, but add information about the addresser's (speaker's) internal state, examples: "Wow, Ouch, Bah, Oh, Yuck". The conative function is an orientation toward addressee directly. It is illustrated by vocative and imperative sentences, examples: "Tom! Go Away". The poetic function focuses on "the message for its own sake and is the operative function in poetry as well as slogans, examples "horrible Vanda" instead of "terrible Vanda" or "dreadful Vanda" which have the same meaning. The phatic function is language for the sake of interaction. It sets for contact establishes, prolongs or discontinues the communication. We use this function to know whether the channel works or whether the contact is still there, e.g. "Do you hear me?" The metalingual or alternatively called metalinguistic or reflexive function is the use of language to discuss or describe itself. It is used whenever the addresser and the addressee need to check whether they use the same code and when the language is used to speak about language, e.g. "What do you mean by "unplugged?". While according to Nababan (1993:1) language as a tool of communication has an important

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role in human interaction because it is used to form and support social relationship.

Hymes (1974:55-62) characterized some factors that strongly influence the speaker in the speech event into several speech components. Those components are arranged in such ways: S (settings / scene), the setting is a time and place of speech act, P (participant) is a speaker and audience, E (end) that is the goal or purpose and outcome of conversation, A (act) is an event in which a speaker is in talks, K (key) us the clues that establish the tone, manner, or spirit of the speech acts, I (instrumentality) is form and style of speech. N (norm) is social rules governing the event and the participants' action and reaction. G (genre) is the kind of speech act or event. From the explanation of those components, we know that the speaker must know how to talk in appropriate sentences, tones, manners according to the topic, event and situation.

The use of language for communication is determined by two factors, namely linguistic and non linguistic factors. One of nonlinguistic factors that affect the use of language is the social factor. It is because language is basically part of the communal system. The study of language is related to social factors is an interesting study. It is named sociolinguistics. Hudson (1996:1-2) said that sociolinguistics is not only about the form of language and its variations, but also the use of language in society. There are special social values and cultures in the use of language in every group of society.

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As an object of sociolinguistics, the use of language in bilingual and multilingual community is interesting to study. In bilingual or multilingual community, people have a tendency to use two or more languages interchangeably for communication. They use language variety and variations in communication according to their situation, social and cultural background. This kind of phenomenon is recognized as code-switching. Code-switching, actually talks about the using of two languages in the same sentence or discourse (Marasigan, 1983). Code-switching is a transitional language phenomenon that occurs due to the use of the language situation. It occurs when people switch more than one language in one speech event for the communication.

Code-switching can be found effective in teaching and learning in a classroom context. In education forum, especially in teaching and learning activity, language has a function as a tool to convey informations. In teaching and learning activity, language choice has a considerable influence towards success of the hearer to interpret the speaker's message. In chemistry classroom, the teacher often switches her language for a certain purpose in a specified situation. Code-switching is frequently used by teachers at school during teaching and learning process. The teachers frequently change from one language to another language in conveying her messages in the classroom.

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1.2 Reason for Choosing Topic

Code-switching can be found frequently in many places. It is also found frequently in school. The teachers use code-switching during teaching and learning process in the classroom. They use it for giving informations and lesson materials to students. The use of code-switching has some advantages for communication in the classroom. It becomes a common phenomenon in teaching and learning activity. It is determined by culture and habit of the teachers. The behavior of teachers to express and convey the information using code-switching in the classroom need to be studied to get the overview about the teachers' code-switching that occur naturally in the classroom.

Based on the information above, the writer is interested in doing research about code-switching that is used by the teacher in the chemistry classroom in SMA Negeri 14 Semarang. The writer choosed this school because it is one of the national standard schools in Semarang. Further, the writer wants to know the types, the functions and the role of code-switching which is used by the teacher in the classroom. The writer only takes the utterances of the teacher during teaching and learning process in the chemistry classroom. In teaching and learning process, the chemistry teacher uses Indonesian as the primary language, Javanese and English as secondary languages. Furthermore, besides explaining about the types and the function of teacher's code-switching in conveying lesson material to the student in the classroom, the writer also reveals the role, and the reason of code-switching in teacher's emotion.

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Hence, the writer chooses the title as follows: Code-switching in the Classroom of SMA Negeri 14 Semarang.

1.3 Statement of the Problem

To explain the scope of this study, the problem limitation should be stated. The purpose of problem limitation is to avoid misunderstanding of this problem and as an important bases for the further explanation of the problem. This research is one part of the sociolinguistic study that emphasizes on code-switching in communication, especially in the classroom, therefore, the problem of this study can be stated as follows:

1. What are the types of code-switching that is present in the utterances of the chemistry teacher of SMA Negeri 14 Semarang in the classroom?
2. What are the functions of code-switching used by the chemistry teacher of SMA Negeri 14 Semarang in the classroom?
3. What are the roles and the reasons of code-switching in teacher's emotion?

1.4 Objective of the Study

In general, the purpose of this study provides a description of how code-switching occurs in the classroom in SMA Negeri 14 Semarang. Hence, the aims of the study are:

1. To explain types of code-switching that occurs in the utterances of the chemistry teacher of SMA Negeri 14 Semarang in the classroom.

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2. To explain the functions of code-switching used by the chemistry teacher of SMA Negeri 14 Semarang in the classroom.
3. To explain the roles and the reasons of code switching in teacher's emotion in the classroom

1.5 Significance of the Study

The writer expects that significance of this code-switching study have benefits as follows.

First, after reading this thesis, the readers will get knowledge and information about code-switching that occur during teaching and learning process in the chemistry classroom.

Second, the teachers will get knowledge and information about code-switching and that occurs teaching learning process in the classroom and use code switching as a strategy communication in the classroom with the students.

Three, the results can be used for the further researches which focus on developing classroom interaction between teacher and students by using code-switching.

1.6 Scope of the Study

The scope of the study is the chemistry teacher at year ten of SMA Negeri 14 Semarang. When the teacher teaches and convey materials to the students, there are some English words that refers to chemical terms. Those English

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words can not be translated into Indonesian, because those are chemical terms that has been used in international. That is why the teacher of chemistry uses minimal two languages in the classroom. The study concerns with code-switching that occur during teaching and learning process in the chemistry classroom. Through this study, the writer intends to give some information about code-switching used by the teacher in the classroom especially in the chemistry classroom.

1.7 Organization of Writing

This study consists of five chapters. In order to help the readers in comprehending the study, this study is systematized as follows:

Chapter one shows background of the study, reasons for selecting the topic, statement of the problem, objective of the study, the significance of the study, the scope of the study, and the organization of writing. In general, this chapter provides the framework or the ground thinking of this study to bridge the following chapters.

Chapter two provides the review of the related literature. It describes the theories used in developing the study. All of them will serve the fundamental references in conducting and analyzing the study.

Chapter three concerns on the method of investigation carried out by the writer. It gives the description of research design, the target of population, research instrument, technique of collecting data and data analysis.

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Chapter four discusses the main purpose of this study. It provides the explanation of the types, the function, and the roles of code-switching used by the chemistry teacher in the classroom.

Chapter five provides the discussion of the study at the conclusion and followed by the suggestions given by the writer at the end of the study.

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CHAPTER II

REVIEW OF THE RELATED LITERATURE

2.1 Previous Studies

Sociolinguistics is the study that attracts many linguists. This is due to a phenomenon, that language and social culture in the community is dynamic. There are some previous studies about code mixing and code switching. In this chapter, the writer will show the previous studies which are similar to the types and theories of this research.

First, The Analysis of Code-Switching and Code-Mixing in the Teen-lit Canting Cantiq by Dyan Nuranindya written by Dias Astuti Cakrawarti (2009). The writer examines the types of code-switching and code-mixing used in the Teen-lit Canting Cantiq by Dyan Nuranindya and describes the reason the characters in Canting Cantiq by Dyan Nuranindya do their language mixing and switching. The results of this study are six types of code-switching and code-mixing in Canting Cantiq namely intra-sentential switching, inter-sentential, switching, emblematic switching, intra-lexical code-mixing, establishing continuity with the earlier speakers, and involving a change of pronunciation. The popular types of code-mixing and code-switching is intra-sentential switching because in the Teen-lit Canting Cantiq there are many English and regional words inserted in the speech. In addition, there are ten causes of code-switching and code-mixing, and the most

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dominant group is expressing identity. The reason is that most young characters in this teen-lit life belong to a modern community so they used to mix Indonesian, English and regional languages in their daily conversation.

Second, A Study on Code Switching used by English Teachers of State Senior High School I Batu (R SMA BI Negeri Batu) by Meirissa Ferrara (2011). The writer examines the types and the functions of code switching used by an English teacher in a school context at State Senior High School I Batu. The writer finds several types and functions of code switching used by English teachers. There are two types of code switching: (1) extra-sentential code switching is used to ask a question implicit by stressing teachers intonation at the end of the sentence, (2) intersentential code switching is used to give a translation from the target language (TL) to L1 (or vice versa) of part of the sentence (clause) and the whole of a sentence between clause or sentence boundary. There are four functions of code switching: (1) interjection is used to fill the gap of the sentence by inserting sentence fillers and inserting connector, (2) repetition is used to clarify and to give direct translation of the word, clause or sentence by using another language, (3) intention of clarifying the speech content of the interlocutor is used to give the similar word from TL to L1 (or vice versa) to clarify unknown word and (4) real lexical need is used to give relevant meaning because the is no equivalent meaning to substitute the lexical word.

Third, An Analysis of Indonesian-English Code-Mixing used in Tempo Magazine (January 2006) written by Rini Subekti (2006). The writer examines the

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forms of code-mixing, the types of code-mixing and the reasons for using code-mixing. The results of this research showed that the forms of code-mixing were: word, phrase and idiom. The types of code mixing were inner and outer code-mixing. There were two reasons for using code-mixing, namely: need-filling motive and prestige-filling motive.

Fourth, Code Mixing and Code Switching in Ketika Cinta Bertasbih I Novel by Itaul Husna (2008). The writer examines the main characters in the novel using both code mixing and switching in Bahasa Indonesia, Javanese, English and Arabic. From 30 utterances, there are 21 utterances in Arabic, 8 utterances in English, and 2 utterances in Javanese. So Arabic is the most frequent. The writer also find that in one utterance spoken by the main characters in the novel, it can have more than one factor that influences them to conduct code mixing and code switching. From 30 utterances, there are 14 utterances that contain setting factors, 11 utterances that contain function factors, 11 utterances that contain participant factor, and 4 utterances that contain topic factors. So, the most frequently used factors are setting, function and participant. In conclusion, most of the main characters in the novel conduct code mixing and code switching in Arabic because they are influenced by setting, function and participant factors.

In order to make the research about code switching more varous, besides discussing the types and the functions of code switching in the classroom, the writer also discusses the roles of code switching in teacher's emotion during teaching and learning process because the previous researches

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not concern to the roles and the reasons of code switching in teacher's emotion. I realized that this research is important to do because it can add new knowledge about code switching that is occured in the classroom.

2.2 Literature Related to the Study

2.2.1 Sociolinguistics

Sociolinguistics is a branch of linguistics that concerned the study of the effects of societal aspects including norm, culture, expectations, context, on the way language is used and the effects of language use in society. It also studies how language varieties differ between groups separated by certain social variables, how creation and adherence to these rules is used to categorize individuals in social classes. As mentioned by Downes (1998) "Sociolinguistics is the branch of linguistics which studies just those properties of language and languages which require reference to social including contextual factors in their explanation."

Sociolinguistics is the study of how language is used and shaped by the social nature of human beings. In its broadest conception, sociolinguistics analyzes the many and diverse ways in which language and society entwine. This wide field of inquiry requires and combines insights from a number of disciplines, including linguistics, sociology, psychology and anthropology. As Fishman said: (in Chaer and Agustina, 2004:3) said:

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> Sociolinguistics is the study of the characteristics of language & varieties, the characteristics of their functions, and the characteristics of the speaker as these three constantly interact, change and change one another within a speech community.

In addition, Holmes (2001:1) mentioned that sociolinguistics concerned with the relationship between language and the context in which it is used. While according to Trudgill (1974:32) sociolinguistics become part of linguistics which is concerned with language as a social and cultural phenomenon. Wardaugh (1986) stated that sociolinguistics is concerned with investigating the relationship between language and society with the goal of a better understanding of the structure of language and how language function in communication.

From many definitions above, we can see that sociolinguistics only focuses on how a language is used, not discuss about the structure of language. As an object in sociolinguistics, language is not seen as a language, but it is seen as a medium to interact or communicate in society. The role of sociolinguistics is to manage a language as it functions in society, or in other words sociolinguistics deals with a language as means of communication in a society. Sociolinguistics examines the interplay of language and society, with language as the starting point.

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2.2.2 Bilingualism / Multilingualism

People use the term bilingualism in different ways. For some people bilingualism means an equal ability to communicate in two languages. For others, it means the ability to communicate in two languages, but with greater skills in one language. Nowadays, it is more common for bilingual people, they become bilingual from birth. The phenomenon people using more than one language for communication can be called bilingualism (Wardaugh, 1986:101). Spolsky (1998:45) defined a bilingual as "a person who has some functional ability in the second language." This may vary from a limited ability in one or more domains to very strong command of both languages. According to Blomfield (in Rahardi, 2001:13), bilingualism is a situation where a speaker can use two languages as well. It means that someone can be said as bilingualism when he can use L1 as well as L2.

Bilingualism is not only privately owned but is also owned by the group, (Mackey, in Chaer and Agustina, 2004:91). It due to the use of language is not only limited among people but is also used as a means of communication between groups. So language is not only as a tool of communication, but also as a group identity. As mentioned by Wolf (1974:5) that one of the characteristics of bilingualism is the use of two or more languages by a person or group of people with no particular role in both languages. It means that both languages can be

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used for anyone, anytime and in any situation, (Chaer and Agustina, 2004:91).

Related to speech community, Hamers and Blanc (1987:45) define bilingualism as follows:

> The state of a linguistic community in which two languages are in contact with the result that two codes can be used in the same interaction and that a number of individuals are bilingual.

In addition, Gumperz (1971:222) also mentions that bilingual people in a community usually use their own idioms for in-group communication and the common language for their interaction and communication with outsiders. In this case, the bilingual have a repertoire of domain-related rules of language choice (Spolsky, 1998:46). It means those bilingual speakers are able to choose which language that he is going to use.

According to Hoffman (1991:3) there are three reasons why people become bilingual, namely because of membership, education, and administration. The example of members' reason is the use of French by all European aristocracy to signal the members of the elite. The example of education and administration reason is the use of English by Indonesians, Scandinavians, Germans, and Dutches in discussing their technologies, academics, or business. In many countries and communities, bilingualism becomes a normal need for daily communication and not a sign of any particular reason (Hoffman, 1991:3). In other words, when the members of a bilingual community

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have the capacity of mastering the languages used in the community, they have to be able to set a condition and situation so they can communicate effectively.

2.2.3 Speech Community

Speech community is a group of people in a wide or narrow scope that interact with specific language that can be distinguished from another speech community group on the basis of significant language differences. As Gumperz said:

> Any human aggregate characterized by regular and frequent interaction with a shared body of verbal signs and set off from similar aggregates by significant differences in language usage. (1971:114)

Unlike Gumperz, Fishman (1976:28) asserts that the speech community is a community whose members know at least one variation of the language along with the proper norms to use. While Hartman and Stork (1972:215) state that the speech community is a group of people at the same place, speak the same language variety, or the same standard language. Speech community is a group of people use the spesific of language and shares a spesific rules for interpreting speech. Speech community is the feeling among the speakers that they use the same language.

From the statements above, basically the speech community is formed due to mutual understanding (mutual intelligibility), because of

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the unity of the linguistic code in detail in its aspects, the sound system, syntax and semantics.

2.2.4 Code

In communication, people usually choose different codes for different topic or situations. They may choose a certain code and a variety of languages to make communication run smoothly. A code is a system that is used by people to communicate with each other. When people want to talk each other, they choose a particular code to express their feelings according to the situation and the purpose. According to Stockwell (2002:8-9) a code is a symbol of nationalism used by people to communicate in a particular language, or dialect, or register, or accent, or style on different occasions and for different purposes. Wardhaugh (1986:102) defined code as the particular dialect or language one chooses to use on any occasion, and a system for communication between two or more parties. While Poedjosoedarmo (1978: 4) said that a code is a system of speech whose elements of language has special characteristics, and it is proper to the background of the speaker, the relation of the speaker to discuss and the situation.

From many definitions above, we can conclude that a code is a form of language variation that is used by people to communicate with each other according to the topic, situation, background of the speaker, and the purpose of communication.

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2.2.5 Code-Switching

Code switching is the situation when people use two or more languages for communication in their community and they change from one language to other language in the same situation and topic of conversation. They often switch one language to another language when communicate with other people who have the same language.

Some linguists use the term code switching and code mixing more or less intercheangebly, especially in formal syntax, morphology, etc. Both terms are used to refers the utterances that draw from elements of two or more grammatical system. These studies are often interested in the alignment of elements from distinct systems, or on constraints that limit switching, (Muysken, Pieter. 2000). Code-mixing and code-switching that occur in bilingual community have similarities, so it is often difficult to distinguish. The similarity is in the mix over the code and the code is the use of two languages or more, or two variants of a language in a speech community.

There are several definitions of code switching from the experts that will give the clarity to understand the concept of code-switching. According to Wardaugh (1986:102) code-switching occurs when the language used, changes according to the situation in which the conversant find them. The speakers here switch one code to another code or they speak in one language to another language. While Appel (in Chaer, 1995: 141) said code switching is the change of one code to

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another. Different from Appel, Hymes (in Chaer, 1995: 142) defined that code-switching not only occurs in the form of language change, but also may happen in the change of the variation of language. “Code-switching has become a common term for alternate use of two or more languages, varieties of language or even speech style." Code-switching is the use of more than one language by communicants in the execution of a speech act. Definition of code-switching also asserted by Suwito (1985:68) "code-switching is switching situation, from one code to another."

Code-switching is considered to be a normal and natural product of interaction in the bilingual or multilingual society for communication. Code-switching usually occurs in bilingual or multilingual society in communication, even though code switching also occurs in monolingual society. In monolingual society, the speaker switches from a variety or style to another. As mentioned by Hymes (in Chaer and Agustina, 2004:107) that code switching not only occurs between languages, but also occurs among a variety or style in a language.

From many definitions above, we can conclude that code-switching is a term in linguistics referring to using more than one language or variety and style in conversation. Code-switching is a complete changing from one code to another code. In conversation or a spoken language, it shows that there is at least adjustment to the sound

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or pronunciation. Code switching is a way to help people transfer their feelings by using more than one language in communication.

Code switching is usually used in informal situations. As explained by Hoffman (1991:113) that code switching can occur often in an informal conversation among people who are familiar and have a shared educational, ethnic, and socioeconomic background. It is avoided in a formal speech situation among people, especially to those who have little in common factors in terms of social status, language loyalty, and formality.

Furthermore, code switching occurs in some places including school. Simon (2001) in Zabrodskaja (2007) states that code switching is inevitable in the classroom if the teachers and students share the same languages and should be regarded as a natural component of bilingual's behavior. Code switching happened in school because students and teachers come from different places and regions so they have different languages. The teacher can use different languages alternately if teachers and students have the same language and students can understand well their utterances. Teacher and students switch their language naturally. Nevertheless, the unawareness to switch the language between them can give meaningful meaning.

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2.2.6 Types of Code-Switching

According to Blom and Gumperz (1971) in Wardaugh (1986), code switching can be classified into different classification, i.e. grammatical and contextual classification.

2.2.6.1 Grammatical Classification

Grammatical classification is based on the place where the sentence or utterance the switching appears. There are three types of code-switching in grammatical classification, i.e. tag code-switching, inter-sentential code-switching, and intra-sentential code-switching.

1. Tag code-switching

   A tag code-switching happens when a bilingual speaker insert short expression (tag) from different language at the end of his/her utterances. Here are the examples: An Indonesia bilingual speaker switches from Indonesian to English, e.g:

   - " DIA benar-benar cantik, *right*?"
   - "Kulitnya bersinar, *just like a pearl*."
   - "Kamu akan baik-baik saja, *don't worry*."

2. Inter-sentential code switching

   An inter-sentential code switching occurs when there is a complete sentence in a foreign language uttered between

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two sentences in a base language. There are examples of this code switching, an Indonesian bilingual speaker switches from Indonesian to English, e.g.

- "Aku akan menjenguknya sekarang. *The sooner the better*. Sebelum dia pulang ke rumah."
- "Adegan itu sangat berbahaya. *Don't try this at home*. Apalagi buat anak- anak."

3. Intra-sentential code-switching

An intra-sentential code-switching is found when a word, a phrase or a clause of foreign language is found within the sentence in the base language. There are examples of this code switching; an Indonesian bilingual speaker switches from Indonesian to English, e.g.

- " Menurut saya, harga yang ada di laporan tersebut sudah di *mark up*, supaya dapat untung lebih."
- " Calon gubernur *incumbent* itu berpeluang untuk menang."

2.2.6.2 Contextual Classification

Contextual classification is based on the reason why the sentence or utterance is switched. Unlike the grammatical classification, which is based on the position of the different codes found in the utterances, the contextual classification is

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based on the reason people switch their language. There are two types of code-switching in contextual classification, i.e. the situational and metaphorical code-switching.

1. Situational code switching

A situational code switching that is appeared when there is a change in the situation that causes the bilingual switches from one code to another code. (Jendra, 2010:76). According to Wardhaugh (1986:103) situational code switching occurs when the languages used change according to the situation. The speaker speaks one language in one situation and another language in a different situation, but there is no topic change. Hymes (1964) (in Jendra, 2010:76) also said that the factors of choosing a code in changing situation could be the Setting, the Participants or the Norm of interaction. The following short conversation describes an example of a situation when an Indonesian speaker switches from Indonesian to English because of the presence of English speakers (participant).

Alda: Besok kita jadi mengerjakan tugas?

Tina: Tentu saja, kita sekelompok dengan Philip.

Alda: Ya sudah berarti kita beritahu Philip supaya besok datang ke kampus. Nah itu dia orangnya. Philip...!

Philip: *hi, how are you?*

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Tina: *Fine*.

Philip: *What are you doing?*

Alda: *Nothing, Just want to tell you that you are a member of our group and we will discuss the sociolinguistics paper tomorrow.*

Philip: *OK. No problem.*

2. Metaphorical code-switching

A metaphorical code-switching occurs when there is a change in the perception, purpose, or topic of the conversation. In reference to the factors, this type of switching involves Ends, the Act Sequences and the Key, but not the situation. Saville-Troike (1986:62) defined metaphorical code-switching as a code-switching that is occured within a single situation but adding some meaning to such components. The following dialog is an example of this switching. An Indonesian switches from Indonesian to English to affect a serious dialog to a humorous.

Tia: Sudah lama kita nggak jalan-jalan ke mal.

Deva: Iya nih, butuh refresing juga. Capek kuliah terus.

Tia: Besok minggu ya, sekali-sekali kita *walking-walking, looking-looking, eating-eating.* Pokoknya kita *fun-fun* lah ha..ha..

Tia: *Are you coming with us*?

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Mischa: *OK. No problem.*

In addition, Poplack (in Becker, 1997:6) classifies code-switching in the following: full sentence, conjoined sentence, between major noun phrase and verb phrase, between a verb phrase and object noun phrase, between a verb phrase and a prepositional phrase, between verb and adverb, between noun and adjective, between determiner and noun, between auxiliary and verb, single noun, interjection, tag phrase.

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2.2.7 Functions of Code-Switching

When people use code mixing and code-switching, there are many reasons of the speakers as an important consideration of the process. Zentella (1985) argues that there are several functions of code switching, i.e.

1. People may use code-switching to hide fluency or memory problems in the second language.
2. Code-switching is used to mark switching from informal situations (using native languages) to formal situations (using second language) and vice versa.
3. Code-switching is used to exert control, especially between parents and children.

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4. Code-switching is used to align speakers with others in specific situations (e.g. defining oneself as a member of an ethnic group).

In addition, according to Hoffman (1991:116), there are several reasons for bilingual or multilingual speakers to switch their languages such as talking about a particular topic, quoting somebody else, showing empathy about something, interjection (inserting sentence fillers or sentence connector), repetition used for clarification, expressing group identity, and intention of clarifying the speech content for the interlocutor. Here are the explanations:

1. Talking about a particular topic

   People in bilingual communities sometimes prefer to talk about a particular topic in a particular language. They feel free and more comfortable to express their thoughts and emotional feelings when they use a particular language in their communication. This phenomenon can be found in the classroom. The teachers prefer to use their L2 to make a joke. Teachers will be more comfortable and feel free when using L2 to make a joke.

2. Quoting somebody else

   People often switch code to quote a famous expression, proverb, or saying of some famous figures. The switch like a set of quotation marks. They use it because they want to express and emphasize on something to look better. In Indonesian those well-

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known figures are mostly from some English-speaking countries. For example: Saya lupa namanya, *What is a name?* (I forget his name. *What is a name?)*. The sentence '*What is a name?'* is a popular quotation from Shakespeare, well-known poet from England.

3. Showing emphatic about something (express solidarity)

   People often switch their language to express empathy about something. In some case using a second language make them feel more convenient to show their emphatic rather than using first language (or vice versa). Moreover, the appropriate usage is able to make the meaning stronger. For example: Saya yakin kamu bisa melakukannya, *Ganbate!* (I'm sure you can do it, *Ganbate!*). In this utterance, the speaker uses the word *ganbate* because he wants to spirit to his friend in doing something.

4. Inserting sentence fillers (interjection)

   Interjection is the words which are inserted into a sentence as sentence fillers or sentence connector that's frequently used by people such as, By the way, Anyway, And, etc. Interjection is also a short exclamation like: Darn, Hey!, Well!, Look!, etc. For example: *By the way*, gimana kabar orang tuamu? *(By the way*, how are your parents?)

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5. Clarifying repetition

Repetition used when a bilingual or multilingual speaker wants to clarify his speech in order to give clear explanation and information, so the hearer will understand what the speaker wants. Frequently, a message in one code is repeated in the other code literally. A repetition is not only served to clarify what is said, but also to emphasize on a message. For example: English_Hindi (Gumperz, 1982:78) Father calling his small son while walking through a train compartment, "Keep straight. Sidha jao" (keep straight).

Oksaar (1974), Poplack (1980), and Calsamiglia and Tuson (in Hoffman: 1991) propos that code switching also can be used to express group identity. Code switching can be used in many groups of people, whether minority or mainstream groups. The way of communication of people in their group is obviously different from the other groups. In other words, the way of communication of one community is different from the people who are out of the community. Each group has a particular language and it can be understood by people in that group. For example: Anakmu sudah *katam* Quran? (Have your son katam Quran?). The word *katam* is commonly used to say someone who has finished reading Quran.

McClure (1977) in Hoffman (1991) points out another reason of code switching, i.e., intention of clarifying the speech content for

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interlocutor. People switch their language in order to clarify what they are talking about. A message in one code is repeated in the other code in somewhat modified form to fulfill the appropriate meaning in order to make the conversation run smoothly. Moreover, intention of clarifying the speech content for the interlocutor is used to emphasize on the word order to focus a particular topic. For example: Do you know Gangnam Style? *Tarian yang fenomenal itu lho.* (Do you know Gangnam Style? *The phenomenal dancing.)* The speaker explains in the Indonesian language to make the hearer understand about Gangnam Style. Eldridge (1996) (in Gulzar 2010) asserted that when messages are not comprehended in one language (target language) they are explained in another language (mother language).

Savile and Troike (1986) propose three additional functions reasons why people switch their language when they communicate with bilingual society. Those are:

1. Strengthening ask or command

   The switching from language A into language B can for some people also function as a request because language B is not their native tongue, so it does not sound as direct as language A. However, code switching can also strengthen a command since the speaker can feel more powerful than the listener. For example:

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Kamu jangan pergi ya, *Please.* (You don't go, *Please*). The speaker uses the word "please" to soft his request to other people.

2. Providing real lexical need

The most common reason for a bilingual / multilingual person to switch or mix their languages is due to the lack of equal lexicon in the languages. When an English-Indonesian bilingual has a word that is lacking in English, he will find it easier to say it in Indonesia. When he has a word that is lacking in Indonesian, he will use the English term. If it puts into Indonesian, the meaning will be vague and sometimes it would not be used. For example: Kemarin kita belajar tentang larutan *buffer*. (Yesterday, we learned about *buffer* solution.) The word *buffer* refers to chemistry term.

3. Excluding other people when a comment is intended for only a limited audience

When people want to communicate only to certain people or community they belong to, they switch their language to particular languages. They switch to particular languages to avoid the other community or interference objected to their communication. They may try to exclude those people by using the language that only the community knows. For example, a foreigner is more convenient to speak in L1 with their community when there are other people from outside their community.

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2.2.8 Bilingualism and Emotion

Pavlenko (2002) (in Furmanek, 2006) has attention to the interdependence between emotions and bilingualism. The emotional people speak of emotive discourse and of discourse on emotions. Emotional reactions are generally manifest in intended and intellectual communicative strategies. Bilingualism adds new dimensions to the emotive aspect, it caused for preferring to use different languages in different contexts. The emotion deals with their role in selecting one language over another or in selecting terms in a given language that had been acquired in a context strongly marked by emotion. (Furmanek, 2006). Malik (1994) states that usually when bilinguals are tired or angry, code-switching takes place with a new dimension. This means, when the speaker is in the right state of mind, he/she can find the appropriate word or expression in the base language.

Languages play an important role in schools, both as a tool to convey the lesson material and media of instruction. language choice for emotion speech acts is governed not only by language dominance, social context, linguistic competence of the interlocutors and perceived language emotionality, but also by affective resources offered by the languages and the speakers' competence and level of comfort with these resources.

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2.2.9 Bilingualism in SMA Negeri 14 Semarang

In SMA Negeri 14 Semarang, in teaching and learning activity in the classroom often occurs conversations between teachers and students using Indonesian and Javanese. Indonesian used in formal situation while Javanese used in informal situation. In the classroom is formal situation, so the teachers use Indonesian to convey lesson material. But sometimes the teachers insert Javanese in their utterances during covey leson material to change topic that is not related to the lesson material, it make the situation informal situation in the classroom.

2.2.10 Position dan function of Indonesian and Javanese in SMA Negeri 14 Semarang

2.2.10.1 Position and Function of Indonesian in SMA Negeri 14 Semarang

The position of Indonesian in SMA Negeri 14 Semarang as primary language, because it used in education forum. It has function as a main tool in formal communication in the school. The teachers and students tend to talk in Indonesian, especially in the classroom. In conveying lesson material, the teachers often switch their primary language Indonesian with secondary language Javanese, because actually the mother tongue of teachers and students is Javanese.

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2.2.10.2 Position and Function of Javanese in SMA Negeri 14 Semarang

Although the Javanese is a mother tongue for the teachers and the students, but the position of Javanese in SMA Negeri 14 Semarang as a secondary language. It has function as daily language. The teachers and the students use it in daily conversation The teachers and the students use Javanese in interaction outside the classroom..

The above theories are an important way to frame the analysis of the data. This classification guides the writer as she examines the language use by chemistry teacher in the classroom. Furthermore, code switching occurs in school because students and teachers are bilingual community so they have more than one language for communication. The teachers use code switching for giving information and lesson materials to students. Code switching can support classroom communication in general as well as exploratory talk integral part of learning. Exploratory talk refers to a particular type of learner talk, namely when the learner is talking about the subject matter at hand in an attempt to comprehend this matter better. In this sense, exploratory talk is a necessary part of talking to learning and is likely to be most effective in learner's main language (Setati et al. 2002).

The situation in which the interaction is taken has an important influence. In this study, the situation of interaction is in the chemistry classroom. As mention by Appel and Muysken (2005:23) that the topic of

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conversation may influence the choice of language so does the chemistry teacher in the classroom which changes the language when she changes the topic. The behavior of teachers to code switches her language in expressing and conveying the information during teaching and learning process need to be studied to get the overview of the teachers's code switching that occurs naturally in the classroom.

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CHAPTER III

RESEARCH METHOD

In this chapter, the writer will talk about research design, target of population, research instrument, technique of collecting data and data analysis from beginning to the end in order to get an empirical conclusion. Before the research was conducted, the writer must decide the method that will be used in conducting the study of the research. According to Koentjaraningrat (1983:7) research method is a method used to understand something or research purposes. While Sudaryanto (1993:9) said that a method is a kind of systematical work plan in order to make the research work become easier, so that it can achieve its main purpose. The method of this research is selected by the writer when she was considering its appropriateness with the research object. This research method is arranged based on the problem and purpose of the research. This study aims to show the types and the functions of code mixing and code switching used by the teacher in doing communication, particularly in teaching and learning activities in the schools.

3.1 Research Design

This research was carried out using qualitative descriptive research approach. A qualitative research is a systematic subjective approach used to describe life experiences. It is normally used to describe and analyze the phenomenon that usually appears in daily activities. Stainback (1988) states that in

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qualitative research, the researcher listens to what people say, observes what they do, asks them questions when appropriate, and participates in their activities whenever possible. Since the purpose of qualitative research was to explore the depth and complexity inherent in the phenomenon, the purpose of this research was to examine code switching that occurred in the classroom during teaching and learning process. This approach does not use statistic procedure, but a descriptive procedure. The writer has the data in the form of words, phrases, clauses and sentences and the data are not presented quantitatively. The writer used observation and interview methods to get data collection.

3.2 Target of Population

Rahardi (2001:8) differentiates the data source into two categories, i.e. primary data and secondary data. Primary data are the data gained directly from the source, meanwhile secondary data are the one gained indirectly. In this thesis, the writer has the primary data. She gets the data directly from the teacher in conveying lesson materials to the students in the chemistry classroom in SMA Negeri 14 Semarang.

According to Arikunto (1999) population is the all elements which are the object of the research. The population of this research is all statements or utterances by the teacher that contain code switching and code mixing in teaching and learning process in the chemistry classroom. Meanwhile, the sample is a half of the population. According to Singarimbun and Effendi

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(1989:155) there are two techniques to get the sample namely: purposive random sampling and purposive sampling. In conducting the research, the writer uses the purposive sampling to get the sample. According to Danim (2004: 98) the purposive sampling is done on the strength of the consideration of the writer. In this research, the writer takes sentence or utterance samples of the teacher in teaching and learning process in a chemistry classroom, which show the different types and functions of code switching clearly. The writer choose chemistry classroom, because in chemistry subject there are many terms of chemical that cannot translate in Indonesian, so during teaching and learning process there are code switching activity.

3.3 Research Instrument

The first steps in the process of doing research are to collect information either directly or indirectly. The mechanism of collecting research information is conducted in many varieties of ways, i.e. interview, survey, observation, and questionnaire. The purposes of research instrument are: as a tool for recording the information from respondents, as a tool for organizing the interview process, to check the job performance of a researcher. In the collecting data, the writer uses instruments of research as follows:

1. Observation Guidance

   The writer uses observation guidance when making observations in line with the purpose of research. The observation guidance are arranged and

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based on object's behavior during interviews, setting and environment around the object.

2. Recorder

The writer uses recorder as a tool to get data in the process of observing and collecting data. The recorder that is used is the voice recorder.

3. Note taking

The writer also takes some notes during observation and collecting information to complete the data.

3.4 Technique of Data Collection

3.4.1 Observation Method

Observation is a method of data collection in which the interesting situation, action, natural phenomena and the work process are recorded as an object of research. Sutrisno Hadi (1980) said that the observation is a complex process, a process which is composed of a variety of biological and psychological processes. Based on the implementation process of data collection, observation can be divided into: participant observation and non-participant observation. In participant observation, the researcher is involved in the daily activities of the observed object. In non-participant observation, the researcher is just as independent observers. In this study, the writer tends to choose observation of non-participant in the process data collection. The writer just sits in the classroom and records all utterances of the teacher in order to know the

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language that the teacher often switches when she teaches her students. The step of observation method is an effort of researchers to give data that are directly related to the investigated problem. The steps of observtion are:

1. Observing the object. The writer makes observation to the teacher's behavior in the classroom when the teacher teaches and interacts with the student.
2. Recording all the speech and behavior of the teacher when teaching in the classroom.
3. Formulating a temporary result.
4. Identifying and classifying the data based on various code switching and the theory.

3.4.2 Interview Method

The interview is a way of collecting data that is used to get the information directly from the source and even more profound in the least amount of respondents. Based on the nature question, there are two types of interview, namely structured interview and unstructured interview. Structured interview is a technique of collecting data with questionnaires that have been arranged. Unstructured interview is an interview that is a free interview. The researchers do not use systematic and complete an interview guide to collect the data. The guidelines of interview form are the outlines of the problem. In this study, the writer

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tends to undertake the unstructured interview as one of the instruments in this research. The writer used the steps of interview as follows:

1. Preparing a research instrument, such as written questions and recording.
2. Writing the result of interviews into the notes.
3. Confirming the results of interviews with informant (teacher).

3.5 Data Analysis

After data collections are completed, the next step is to conduct an analysis of all data that have been collected. Data analysis is a very important part in the research, because from the analysis the writer will find both substantive and formal discovery. Levine (1996) states the definition of data analysis as follows:

> Data analysis is a body of methods that help to describe facts, detect patterns, develop explanations, and test hypotheses. It is used in all the sciences. It is used in business, in administration, and in policy.

The analysis that will be conducted in this study is to show the types and the functions code switching used by the teacher in the classroom in SMA Negeri 14 Semarang. In analyzing the qualitative research there are several steps that need to be done. Here are the steps.

3.5.1 Data Organising

The writer obtains the data directly from the object of research. The data are recorded with a voice recorder. Then the writer makes a

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transcript of the data by changing the data from record form to written form.

3.5.2 Data Classification

In this step the writer has to pay more attention to the data. Based on the theoretical framework and guidelines of interview, the researcher arranges an initial framework as guidance of analysis. With this guidance, the writer selects the data relevant to the subject. The relevant data were coded and explained briefly, then the writer groups and categorizes the data based on the analytical framework that has been made.

3.5.3 Testing the Assumptions or Problems of the Data

In this step, the writer makes a review of the group of data that have been obtained, through analysis based on the theoretical review. So the writer knows whether there is similarity between theoretical foundation and the aachieved results or not.

3.5.4 Writing the Result of the Research

In this step, the writer presents the data obtained from the research by observation, interview and record in the field of study. The process can be described as follows: first, the writer obtains the data from the object by observation, interview and record in the field. Then the writer reads

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the data and understands the problem of the study. After that, the writer makes analysis the data to find out the types and functions of code switching used by the teacher in teaching and learning activity in SMA Negeri 14 Semarang. Finally, the writer conducts the interpretation of the result of the research.

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CHAPTER IV

FINDING AND DISCUSSION

In this chapter, the writer will present the data that obtained from the observation and the transcription of the utterance of chemistry teacher when teaching to grade ten of SMA Negeri 14 Semarang. The data analysis of this chapter is conducted to serve the research focus in chapter I then the data are analyzed and sorted based on the theories in chapter II.

4.1. Data Finding

The writer obtaines the data from observation and transcription of the utterances of the chemistry teacher during teaching and learning process. The chemistry teacher is 53 years old, Javanese woman. She speaks Indonesian and Javanese fluently. When she communicates with her students in the classroom, she uses Indonesian for conveying lesson material. She also uses Javanese and English when she talks about something that is not related to the lesson material. She often switches her language from Indonesian to Javanese, especially when she is angry, annoyed or makes a humorous. She also switches her language from Indonesian to English when she talks about chemical term. The teacher often use rude Javanese words when she expresses her emotion such as when she is angry and annoyed to her students in the classroom. The rude Javanese words appears spontanously when she is angry. It makes her students feel ashamed and afraid of their teacher.

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After observing and analyzing the data, the writer finds the element of Javanese and English language in teacher's code-switching in the classroom.

Tabel 1:

Language elements of code-switching used by the teacher

Code-switching	Indonesian to Javanese	Javanese to English	Indonesian to English
Tag Code	17	0	0
Inter Sentential	58	2	0
Intra Sentential	39	1	0
Metaphorical	74	0	0
Total	149	2	0

In a bilingual community where there are two or more languages, for each participant, it is expected that one of the languages will be dominant and the other will has a secondary role in a conversation. From the above data, we can see that the chemistry teacher in grade ten in SMA Negeri 14 Semarang uses Indonesian, Javanese and English during teaching and learning process. But the most dominant language is Indonesian and Javanese. She uses Indonesian as primary language to convey the lesson material. The Javanese and English as a secondary language. The teacher mostly uses Indonesian as primary language because Indonesian is the language used in education forum.

The chemistry teacher of SMA Negeri 14 often switches the language from Indonesian to Javanese (or vice versa). Sometime she uses English when refers to chemical term. Those elements consist of words, phrases, clauses and sentences. Based on the examples of the teacher's speech

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fragments that refers to the full transcript, the writer will explain the code-switching used by chemistry teacher in the classroom.

Based on the identifying and classifying the data, there are four types of code-switching used by the chemistry teacher of SMA Negeri 14 Semarang in the classroom, i.e. (1) tag code-switching, (2) inter sentential code-switching, (3) intra sentential code-switching and (4) metaphorical code-switching. There are four examples of tag-code-switching, four examples of inter-sentential code-switching, four examples of intra sentential of code-switching and four examples of metaphorical code-switching. Each type of those code-switching is discussed below:

4.1.1 Types of Code-Switching

The writer finds four types of code-switching used by a chemistry teacher of SMA Negeri 14 Semarang in the classroom.

4.1.1.1 Tag-Code-Switching

Tag-code-switching is a sort of switching where tags and certain set phrases in one language are inserted into an utterance otherwise in another. This kind of code-switching occurs when a speaker insert short expression (tag) from different language at initial, middle and end of his/her utterances. The writer finds type tag-code-switching in the data. The tags implicated in Indonesian-Javanese, tag-code-switching can be vocabulary, such as Javanese *"podo wae"* =

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it is the same, *"kan ngono to"* = isn't it, *"ya to"* = isn't it, *piye* = "how", *"bener to"* = right. All the tag inserted at the end of sentences. Here are the examples:

Example 1:

(1) *"...lebih mudah kerjakan di depan saja, podo wae."*

"... it is easier to be done in the front, it's the same."

The data clearly show that the teacher uses two languages, Indonesian and Javanese language. The Javanese tag *"podo wae"* is inserted at the end of a sentence. It is a short expression of the teacher. This kind of code mixing occurs when the teacher asks the student to answer the question at the whiteboard.

Example 2:

(2) *"C2H2 + O2 membentuk... kan ngono to?"*

"C2H2 + O2 is to form... isn't it?

The data clearly show that the teacher uses two languages, Indonesian and Javanese. The words "C2H2 + O2 membentuk..." are Indonesian, the tag "*kan ngono to*" are Javanese. The words "*kan ngono to*" is inserted at the end of the sentence which is followed by a question mark to indicate a question tag. The tag *"kan ngono to"* is equal to "isn't it" in English. It is a short expression of the teacher. This kind of code mixing occurs when the teacher explains the lesson

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material to the students and make sure whether the students understand or not.

Example 3:

(3) *"... yang diketahui volume NH3 = 5 liter, ya to?"*

"... which is known, volume NH 3 = 5 liter, isn't it?"

The data clearly show that the teacher uses two languages, Indonesian and Javanese. The words "yang diketahui volume NH3 = 5 liter" are Indonesian, the tag "*ya to"* are Javanese. The tag *"ya to"* is inserted at the end of the sentence which is followed by a question mark. The tag *"ya to"* is equal to "isn't it" in English. It is a question tag and a short expression of the teacher. This kind of code mixing occurs when the teacher explains the chemical formula to the students.

Example 4:

(4) *" ...bentuk gram jadikan mol, piye?"*

" ...gram is converted to mol, how?"

The data clearly show that the teacher uses two languages, Indonesian and Javanese. The Javanese tag *"piye"* is inserted at the end of the sentence which is followed by a question mark. The Javanese tag *"piye"* is equal to *"how"* in English. It is a short expression of the teacher when the teacher

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is annoyed because one of the students still do not understand about the material that she has explained.

4.1.1.2 Inter-Sentential Code-Switching

This kind of code-switching occurs when there is a sentence in a foreign language uttered between two sentences in a primary language. Inter-sentential code-switching is the easiest types of code-switching to recognize because it occurs at the sentence level, where syntactic boundaries are clearly not interfering. Here are the examples:

Example 1:

(5) "Dihapus itu! Rak ana 4/3 ning kono. S sebelah kiri berapa?"

"Erase that! There is no 4/3 over there. How many S on the left?"

The above data clearly show that the teacher uses two languages, Indonesian and Javanese. The teacher uses Indonesian as a primary language then she switches her language into Javanese as a second language. The sentence "*Rak ana ¾ ning kono*" is Javanese, the sentences *"Dihapus itu!"* and *"S sebelah kiri berapa?"* are Indonesian. The Indonesian sentence *"Dihapus itu!"* is a sentence order and uttered between two Javanese sentences. The sentence "*Rak ana ¾ ning kono*" is is equal to "There is no ¾ over there".

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This kind of code-switching occurs when the teacher asked the student to answer the question and he always made mistakes.

Example 2:

(6) *"Angkanya kan berbeda to. Matematikane piye cah."*

"The number is different, right. How is your mathematics?"

The above data clearly shows that the teacher uses two languages in her utterance Indonesian and Javanese. She switches her language from Indonesian into Javanese. The Javanese sentence *"Matematikane piye cah?"* is uttered after Indonesian sentence *"Angkanya kan berbeda to*." The sentence *"Matematikane piye cah?"* is equal to "How is your mathematics." It was a comment of the teacher when the student made a mistake in answering questions.

Example 3:

(7) *"Jikuk bukumu! Hei Nisrina bukunya diambil! Ar wis ana lho ya?"*

"Take your book! Hei Nisrina take your book! There was Ar, isn't it?"

The data clearly show that the teacher uses two languages, Indonesian and Javanese. The teacher uses Javanese as a primary language. She switches her language into Indonesian. The sentence *"Hei Nisrina bukunya diambil"* is Indonesian, the sentences *"Jikuk bukumu!"* and *"Ar wis ana lho ya?"* are Javanese. The Indonesian sentence *"Hei Nisrina*

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bukunya diambil!" is uttered between two Javanese sentences and followed by an exclamation mark to indicate a command sentence. The sentence *"Hei Nisrina bukunya diambil!"* is equal to "Hei Nisrina take your book". The Indonesian sentence is a repetition of Javanese sentence. This kind of code-switching occurs when the teacher commanded her student to take her book. It shows the power of the teacher.

Example 4:

(8) *"Contone wis akeh, wis ana rumuse, rak tau nyatet apa piye? Makanya kalau pas materinya nggak bisa, tanya, Bu Yani akan terangkan"*

"There are so many examples, the formula still exists, you never write or what? So if you don't understand the material, ask, Mrs. Yulia will explain it."

The above data show that the teacher uses two languages, Indonesian and Javanese. The teacher uses Javanese as a primary language, then she switches her language into Indonesian. The sentence *"Makanya kalau pas materinya nggak bisa, tanya, Bu Yani akan terangkan"* is Indonesian, the sentences *"Contone wis akeh, wis ana rumuse, rak tau nyatet apa piye?"* is Javanese. The Indonesian sentence *"Makanya kalau pas materinya nggak bisa, tanya, Bu Yani akan terangkan"* is uttered after Javanese sentence *"Contone wis akeh, wis na rumuse, rak tau nyatet apa piye?"* This kind of code-switching occurs when the teacher asserts the student

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whether she understand about the material or not, if she still do not understand, the teacher will explain the material once more.

4.1.1.3 Intra-Sentential Code-Switching

This kind of code-switching occurred when a word, a phrase or a clause of foreign language is found within the sentence in the primary language. Here are the examples:

Example 1:

(9) *"Naufal, mau bu Yani wis omong kalau yang diketahui volumenya, dibagi 22,4."*

"Naufal, I've told you if the volume is known, it is divided by 22,4."

The above data show that the teacher uses two languages, Indonesian and Javanese. The teacher uses Indonesian as a primary language and Javanese as a secondary language. She switches her language from Javanese into Indonesian in one utterance. The clause *"Mau bu Yani wis omong"* is Javanese followed by Indonesian clause *"...kalau diketahui volumenya, dibagi 22,4".* This kind of code-switching occurs when the teacher gives information to the student when he makes mistakes in answering the question.

Example 2:

(10) *"Masih ada 2 jam kancane rak bar-bar, masih banyak materi."*

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"We still have 2 hours, your friends have not done yet, still a lot of material."

This data show that the teacher uses two languages, Indonesian as primary language and Javanese as a secondary language. She switches her language from Indonesian to Javanese. The Javanese clause *"kancane rak bar-bar"* is equal to *"your friends have not done yet."* It is inserted in the middle of the sentence. That utterance occurs when the teacher gives information to the students that the they still have 2 hours remain to discuss the material.

Example 3 :

(11) *"Besok kan ada tiga jam, sakkelas maju kabeh."*

"Tomorrow, we will have three hours, all students will come forward."

The above data shows that the teacher uses two languages, i.e. Indonesian and Javanese. The teacher uses Indonesian as a primary language and Javanese as a secondary language. She switches her language from Indonesian to Javanese. The Javanese clause *"sakkelas maju kabeh"* is equal to "all students will come forward". The Javanese inserted at the end of a sentence. In addition, this kind of code-switching occurs when the teacher requires the students to answer a question from the book, but there is none of the students answer the question on the white board in front of the class.

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Example 4:

(12) *"Mulakno tulis dulu mol sama dengan masa per?"*

"Therefore, write mol is equal to mass divided by?

The above data shows that the teacher uses two languages, i.e. Indonesian and Javanese. The teacher uses Indonesian as a primary language and Javanese as a secondary language. She switches her language from Javanese to Indonesian. The Javanese word *"mulakno"* is equal to "therefore" The Javanese word inserted at the beginning of Indonesian sentence. In addition, this kind of code-switching occurs when the teacher gives information to the student, when he makes mistakes in doing exercise.

4.1.1.4 Metaphorical Code-Switching

A metaphorical code-switching occurs when there is a change in the perception, purpose, or topic of the conversation. The interesting point in metaphorical code-switching is that some topics may be discussed in either code, but the choice of code adds a distinct flavor to what is said about the topic. The use of a metaphorical code-switching redefine the situation, formal to informal, official to personal, serious to humorous, and politeness to solidarity**.** Conducted during the study, the writer finds such type of code-switching. The teacher often switches

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her code when she teaches her students in the classroom to change the topic. Here are the examples:

Example 1 :

(13) Guru: "*Kowe ki wis D3, PDD akeh banget ketoke ora PHD lho.*
Student: *PDD apa bu?*
Teacher: *Penurunan daya dengar alias kopoken!*
Students: Ha..ha.. (Laughing)
Teacher: *Ora Phd, PDD penurunan daya dengar alias...?*
Students: *Kopok."*

Teacher: "You are D3, PDD it seems a lot of thing not PHD.
Student: What is PDD Mam?
Teacher:... lost hearing a.k.a kopoken.
Students: Ha..ha.. (Laughing)
Teacher: Not Phd. PDD lost hearing a.k.a..?
Students: Kopok."

The data clearly show that the teacher uses two languages, Indonesian and Javanese. The teacher uses Indonesian as a primary language and switches her language into Javanese. The word *"kopoken"* is Javanese and it is uttered at the end of a sentence. The Javanese word *"kopoken"* is equal to "ear disease". The teacher uses the Javanese word *"kopoken"* because she wants to make a joke so the classroom atmosphere is not strained. Indonesian people, especially Javanese people usually use the word *"kopoken"* to insult someone that cannot hear, although she/he doesn't have ear disease. This example shows the teacher change the situation

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from serious into humorous situations by switching her language.

Example 2:

(14) *"Bayu Pamungkas, kowe siswa opo ledek kethek? Nek siswa ki pakeane rapi. Ayo masukkan!"*

"Bayu Pamungkas, are you student or ledek kethek? The student is neatly dressed. Tidy up!

The data show that the teacher uses two languages, Indonesian and Javanese. Just like the first example, the teacher uses Indonesian as a primary language and switches her language into Javanese. The sentence *"kowe siswa opo ledek kethek? Nek siswa ki pakeane rapi"* is Javanese and it is uttered at beginning of sentence. The Javanese *phrase "ledek kethek"* is equal to "monkey dancer". The teacher uses the Javanese phrase *"ledek kethek"* because she wants to insult one of her students who does not neatly dressed. Indonesian people, especially Javanese people usually use the word *"ledek kethek"* to mock someone who is not looking good. The teacher switches her code from Indonesian into Javanese to change the situation from formal to informal situation.

Example 3:

(15) *"Naufal, mau bu Yani wis ngomong kalau yang diketahui volumenya dibagi 22,4, kalau diketahui gramnya dibagi Ar atau Mr."*

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> " Naufal, Bu Yani has told you that the volume is divided by 22.4, if you have known the gram, it is divided by Ar or Mr."

The above data show that the teacher uses two languages, Indonesian and Javanese. Just like the first example, the teacher uses Indonesian as a primary language and switches her language into Javanese. The clause *"...mau Bu Yani wis ngomong..."* is Javanese and it is uttered at beginning of sentence. The Javanese sentence "*...mau Bu Yani wis ngomong"* is equal to "...Bu Yani has told you". The teacher switches her sentence into Javanese because she wants to give an assertion to her student that she has already given an explanation. The Javanese sentence *"...mau Bu Yani wis ngomong"* is an assertion. The teacher switches her code to change personal to official situation.

Example 4:

(16) *"...wis diterangke, kalau unsur, bagian terkecilnya?"*

> "... already explained, what is the smallest of elements?"

The above data shows that the teacher uses two languages, Indonesian and Javanese. The teacher uses Indonesian as a primary language and switches her language into Javanese. The sentence *"...wis diterangke"* is Javanese and it is within a sentence. The Javanese sentence *"...wis diterangke"* is equal to "...already explained". As the third example, the teacher

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switches her sentence into Javanese because she wants to assert to her student that she has already given an explanation. The Javanese sentence *"...wis diterangke..."* is an assertion. The teacher switches her code to change personal to official situation.

4.1.2 Functions of Code-Switching

When people use code-switching, there are many reasons of the speakers as an important consideration of the process. This writer finds that the chemistry teacher has several functions of using code-switching in the classroom. The focus of this section will report the different functional categories that were found in the data.

Tabel.2

Distribution of the function of teacher's code-switching

Function	Number of switches fulfilling this function
2.1 Talking about a particular topic	46
2.2 Emphasizing on some points	4
2.3 Clarifying of the speech contents	3
2.4 Strengthening ask or command	16
2.5 Providing real lexical words	10
2.6 Creating friendly environment	13
2.7 Expressing the emotion	52

From the above data, we know that there are seven functions in teacher's code-switching in the classroom. The chemistry teacher mostly uses code-switching for expressing her emotions. She uses it especially

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when she is angry or annoyed to her students (52 data). Beside that she switches her language from Indonesian to Javanese when she talks about particular topics that are not related to the lesson material such as admonishing the students (46 data). Code-switching also uses to strengthen the command (16 data). The teacher switches her language to show her power by switches her language from Indonesian into Javanese. The teacher also switches her language when she wants to make a friendlier environment in the classroom by making a humor, so she can be closer to her students (13 data). The lack of vocabulary, especially in chemical terms in primary language make the teacher switches her code (10 data). The teacher also switches her language in repetition to emphasize on her words (4 data). The last, code-switching is also used for clarification to make detail explanations so the students more understand (3 data).

The explanations of functions of code-switching used by teacher in the classroom will be discussed below:

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4.1.2.1 To talk about a particular topic

The writer finds that when the teacher talks something that are not related to the chemistry lesson, she often changes her language. Here are the examples:

Example 1 :

(17) *"Dua, Na dan Cl, Na-nya satu, Cl-nya satu, maka dia senyawa. Ada yang tanya? Lainnya? Le..le...kamu le, nek*

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ning warung jegang ngono karo mangan gedang goreng ya."

"Two, Na and Cl. The Na is one, The Cl is one, so they are compounded. Any question? Boy... boy, you boy, if you sit like that with eating fried banana ya."

The data above show that the teacher uses Indonesian as a primary language when she explains the lesson material then switches her language into Javanese to make a joke at the same time she admonishes one of her students. The teacher admonishes her student who sits impolite while she has explained the lesson. The teacher switches her language from Indonesia into Javanese in her communication because she changes the topic from her chemistry lesson to another topic.

Example 2:

(18) *"Aja goblok-goblok ngono lho nggoleki Mr wae rak isa. Diambil catatannya, dilihat Mr-e!"*

"Don't be stupid like that, just find the Mr, you cannot. Take your note, see the Mr!"

The data show that the teacher uses Indonesian as a primary language and switches her language into Javanese when she is angry. It occurs when the teacher sees that one of her students makes mistakes in doing exercise. The teacher switches her language from Indonesia into Javanese in the classroom because she is annoyed to her student, so she switches her language to express her anger.

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Example 3:

(19) *"Saka ndi? Itu 22 lho ya, bukan 23 lho ya. Angkanya kan berbeda to. Matematikane piye cah. Yo, siapa yang sudah ketemu?"*

"From what? That is 22, not 23. The numbers are different, right? How is your mathematics? Yo, who has find the answer?"

The data show that the teacher uses two languages, Indonesian and Javanese. The teacher uses Indonesian as a primary language when she explains the lesson and switches her language into Javanese when she talks something that is not related to the chemistry topic. The sentence *"Saka ndi?"* and *"Matematikane piye cah?"* are Javanese and they occur at the beginning and the end of the Indonesian sentence.

4.1.2.2 To emphasize some points of the speech

Repetition used when a bilingual or multilingual speaker wants to emphasize on his speech. Here are the examples:

Example 1:

(20) *"... jikuk bukumu! Hei Nisrina bukunya diambil!"*

"... take your book! Hei Nisrina take the book!"

The above data show that the teacher uses two languages, Indonesian and Javanese. The teacher switches her language from Javanese to Indonesian. The sentence "... *jikuk bukumu*" is Javanese and it occurs at the beginning of a sentence.

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The Javanese sentence *"... jikuk bukumu"* is equal to "... take your book". The teacher repeats her words in Indonesia to emphasize on her command. It occurred when one of her students still does not understand the lesson material, even though the teacher had explained it many times.

Example 2:

(21) *"Kowe nggoleki apa? Dibaca soalnya! Mencari apa?"*

"What are you looking for? Read the question! What are you looking for?"

The above data show that the teacher uses two languages, Indonesian and Javanese. The teacher switches her language from Javanese to Indonesian. The sentence *"kowe nggoleki apa?"* is Javanese and it occurs at the beginning of a sentence. The Javanese sentence *"kowe nggoleki apa?"* is equal to *"what are you looking for?"* The teacher repeats her words in Indonesia to emphasize on her question. It occurred when one of her students can not do exercise and he makes mistakes.

Example 3:

(22) *"Heh, loro ping loro, loro? Sesuk ning Johar tuku ping pingan. Dua kali dua berapa?"*

"Heh, two times two, two? Tomorrow in Johar, you buy calculator Two times two, how many?"

The above data show that the teacher uses two languages, Indonesian and Javanese. The teacher switches her language from Javanese to Indonesian. The sentence *"loro ping*

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loro" is Javanese and it occurs at the beginning of a sentence. The Javanese sentence *"loro ping loro"* is equal to "two times two". The teacher repeats her words in Indonesia to emphasize on her question. It occurred when one of her students makes a mistake in counting.

4.1.2.3 To clarify the speech content

Repetition used when a bilingual or multilingual speaker wants to clarify his speech to give clear explanation and information, so the hearer will understand what the speaker wants. Here are the examples:

Example 1:

(23) *"Sekarang bu Yani menerangkan* buffer. Buffer *itu penyangga atau dapar."*

"Now, bu Yani is explaining buffer. The Buffer is *penyangga* or *dapar*."

The above data show that the teacher uses two languages, Indonesian and English. The word "buffer" is English. It is a chemical term and occurs at the beginning and the end of the sentences. The teacher uses the English word when she says a chemical term, then she explains it in Indonesian. The teacher explains it in the Indonesian to make the students understand the term "Buffer". This technique used by the teacher because she

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thinks that the students will get a better understanding by given a particular signal.

Example 2:

(24) *"*Volume molar *itu volume gas jika diukur pada suhu dan tekanan tertentu."*

"Volume of molar is a volume of gas if it is measured at certain temperature and pressure.

The above data show that the teacher uses two languages, Indonesian and English. The word "volume molar" is English. It is a chemical term and occurs at the beginning of the sentences. The teacher uses the English word when she says a chemical term, then she explains it in Indonesian. The teacher explains it in the Indonesian to make the students understand the term "volume molar". This technique used by the teacher because she thinks that the students will get a better understanding by given a particular signal.

Example 3:

(25) "Mol *itu standar hitungan, ukuran yang ada dalam ilmu kimia."*

"The Mol the standard count, the existing measures in the chemical sciences."

The above data show that the teacher uses two languages, Indonesian and English. The word "mol" is English. It is a chemical term and occurs at the beginning of the sentences. The teacher uses the English word when she says a

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chemical term, then she explains it in Indonesian. The teacher explains it in the Indonesian to make the students understand the term "mol". This technique used by the teacher because she thinks that the students will get a better understanding by given a particular signal.

4.1.2.4 To strenghten a command

Code-switching can also strengthen a command since the speaker feels more powerful than the listener. Here are the examples:

Example 1:

(26) "*Barisan bodho-bodho turun, duduk, deloki kancane!"*

"The stupids front gets down, sit down, look at your friend!"

The above data shows that the teacher uses two languages, Indonesian and Javanese. The Javanese words *"deloki kancane!"* is followed by an exclamation mark. It is mean that the sentence is a command. The teacher gives the command to her students using Javanese words as a substitute for Indonesian words *"lihat temannya!"* The teacher switches her language when she gives the command to strengthen the command. She feels more powerful than the students by using Javanese words.

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Example 2:

(27) *"Besok kan ada tiga jam, tiga jam sakelas maju kabeh!"*

"We have three hours tomorrow, three hours, one class come forward!"

The above data shows that the teacher uses two languages, Indonesian and Javanese. The Javanese sentence *"sakkelas maju kabeh!"* is followed by an exclamation mark. It means that the sentence is a command. The teacher gives the command to her students using Javanese words as a substitute for Indonesian sentence *"satu kelas maju semua!"* The teacher give a command that tomorrow they will have three hours in chemistry class and she will ask all the students to do the exercises in the front of he class. The teacher switches her language when she gives the command in order to strengthen the command. She feels more powerful than the students by using Javanese words.

Example 3:

(28) *"Ayo Fais maju ke depan, rak isa, nggarap 100 kali di ruang guru. Kerjake kabeh!"*

"Come on Fais, go forward, if you can't, do it 100 times in teacher's room. Do it all"

The above data shows that the teacher uses two languages, Indonesian and Javanese. The teacher switches her language from Indonesian to Javanese. The sentence *"kerjake kabeh."* is Javanese and followed by exclamation mark. It

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means that sentence is a command. The teacher gives the command to her students using Javanese words as a substitute for Indonesian sentence "*kerjakan semua!*" The teacher command that tomorrow they will have three hours in chemistry class and she will ask all the students to do the exercises in the front of he class. The teacher switches her language when she gives the command in order to strengthen the command. She feels more powerful than the students by using Javanese words.

4.1.2.5 To provide real lexical word

The most common reason for a bilingual/multilingual person to switch their languages is due to the lack of equal lexicon in the languages. Here are the examples:

Example 1:

(29) *"Perhatikan disini, kamu tau CH3 COOH kalau dia terhidrolisis H tambahnya 1 tidak 4, jadi akan menghasilkan* ion acetat *CH3 COO- H nya cuman 1."*

"Attention, you know CH3 COOH, if it is hydrolyzed the H plus 1 not 4, so it will produce ion acetate CH3 COO-, the H just 1."

The above data show that the teacher uses two languages, Indonesian and English. The English words "ion acetate" is a term in chemistry. This kind of code switching occurs when the teacher explains about a formula in chemistry lesson. In this situation, the teacher uses the English word "ion

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acetate" as a chemistry term because of the lack synonyms in Indonesian.

Example 2:

(30) *"Kalau diketahui partikel selalu dibagi* Avogadro, *kalau diketahui gram selalu dibagi Ar atau Mr."*

"If it is known as particle it is divided by Avogadro, if it is known as gram it is always divided by Ar or Mr."

The above data show that the teacher uses two languages, Indonesian and English. The English word "Avogadro" is a term in chemical. As the first example, this data occurs when the teacher explains about a theory in chemistry lesson. The teacher uses the English word "Avogadro" as a chemical term because there is no synonym for that term in Indonesian.

4.1.2.6 To create a friendly environment

Code-switching can be used to be friendly with other people. In the classroom the teacher uses it to be friendlier with her students, so she makes humor. Here is the example:

Example 1:

(31) "*Guru: Sakkelas sing bodho dewe Bayu, gedhe, pongpongan. D3. Datang duduk dlongap dlongop.*
Murid-murid: Ha..ha..
Guru: Durung S2 kowe jik D3
Murid-murid: S2 apa bu?

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Guru: Siswa sregep. Nek sregep kan pinter. Kowe D3, datang duduk dlongap dlongop. Wong itung-itungan wae rak mudheng. Mbangeti, sepuluh dibagi satus rak isa, tobat aku. Lha kowe nek nduwe pacar apa rak diapusi? Mas jajake, njaluk duit sepuluhewu mbokei satusewu rak disusuki meneng wae. Gusti...paringono sabar. Omahmu ndi Yu?

Murid: Tambra.

Guru: Wis bergizi lho sakjane. Mangane kan iwak terus. Lha kok uteke ndlosor ki mesti kakean welut kowe.

Murid-murid: Ha..ha..”

“Teacher: In this classroom, Bayu is the most stupid one. Big, *pongpongan*. *D3. Datang. Duduk. Dlongap-dlongop*.

Student: Ha..ha..

Teacher: Not S2 yet, you still D3.

Student: What is S2, bu?

Teacher: *Siswa sregep* (diligent student). If you diligence so you are clever. You are D3. *Datang, duduk, dlongap-dlongop.* You don’t understand how to calculate. Outrageous, ten divided by one hundred you can’t. If you had a girlfriend, you can gullible easily. Mas, treat me, she asks money ten thousand, you give her one hundred thousand and she doesn’t give you a chance. You just keep quiet. God, give me patience. Where do you live, Yu?

Student: Tambra.

Teacher: Actually, it has been nutritious. Always eat fish, but why the brain still *ndlosor*? You must eat eel too much.

Student: Ha..ha..

The above data show that the teacher tries to socialize and create a friendly environment with students by making humor to get the positive results. She uses this to show his feelings of pleasure. She does code-switching to make humor by using Javanese word and the students respond that humor. The

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reaction of the students towards teacher's humor indicates a relationship is developed between the teacher and students.

4.1.2.7 To express the emotion

The teacher switches her language when expressing the emotion, such as: annoyed and angry. Here is the example:

Example 1:

(32) *"Kae sing mburi! Wis nulis rung? Rak ditulis, mendadak bu Yani minta catatan dikumpulkan, tidak ada catatatan lengkap tidak mungkin kamu akan tuntas! Saka ndi belajare? Kae malah turonan ndlosor wae. Lha catetan wae kaya gombal amoh ngono owk. Duh Gusti paringono sabar."*

"You, on the back! Have you written? If you don't write, suddenly Bu Yani ask you to submit your book. If you don't have completed note, impossible for you to complete your study! How can you study? You even lie down "*ndlosor*". *Lha*, your book just like ugly rag. Oh my God, give me patience."

The above data show that the teacher is annoyed to her student. She prefers using Javanese rather than Indonesian to express her feeling. She feels more convenient expressing her emotion using Javanese.

4.1.3 The Role of Code-Switching in Teacher's Emotion

The teacher use of code switching is not always performed consciously. It means that the teacher is not always aware of the functions of the code switching process. Therefore, in some cases it may be regarded as an automatic and unconscious behaviour. The behaviour of the teacher

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switches her language for expressing emotion included into affective function. There are some roles of code-switching in teacher's emotion.

4.1.3.1 Emphasizing emotion in repetition

The teacher uses code-switching in repetition to emphasize her emotion. Here are the examples:

(33) *"Sudah 3 ini, siapa yang belum jelas? Tanya bu Yani! Aja takon kancane!"*

"Already 3, who has not understand yet? Ask bu Yani! Don't ask your friend!

The data show that the teacher uses Indonesian and Javanese in her utterance. She says "*Aja takon kancane*!' in Javanese to emphasize her utterance in Indonesian, "Tanya bu Yani!" She repeats the word *"tanya"* in Javanese *"takon"*. She wants to show her emotion by using repetition so the students know that she is seriously with her words.

Example 2:

(34) "*Heh, Loro ping loro, loro? Sesuk ning Johar tuku ping pingan. Dua kali dua berapa?"*

"Heh, two times two, two? Tomorrow in Johar you buy *ping pingan.* How much, two times two?

The data show that the teacher uses Indonesian and Javanese in her utterance. She repeats her Javanese words *"loro ping loro"* in Indonesian *"dua kali dua"*. She switches her language by using repetition to emphasize her emotion. She is annoyed because her student is a high school student but he still

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makes a mistake by counting two times two. It is seen in her utterance when she asks her student to buy a calculator.

4.1.3.2 Emphasizing emotion in embarrassment

Code-switching used to reveal emotion by insulting people. The teacher switches her language to emphasize her emotion by insulting people in Javanese so her students feel ashamed. Here are the examples:

Example 1:

(35) *"O..lha iki pasangane Bayu pada dhedhele, siji dhedhel loro geblek, pada wae, conto wae rung dihapus. Wah nek iki gelare loro PDL karo PDI, penurunan daya lihat, karo penurunan daya ingatan alias ndlosor."*

'O..this one is Bayu's partner, you are same as Bayu dhedhel, the one is *dhedhel*, the other is *geblek*, both of you are same, The example has not cleaned yet. Wah, he has double title PDL and PDI, decrease in vision and decrease in memory a.k.a *ndlosor*.

The data show that the teacher switches her language from Indonesian to Javanese when she gets emotional. She switches her language to talk about something that is not related to the lesson material. She switches her language to emphasize her emotion by insulting her students in the classroom, so the students feel ashamed. It occurs when one of her students makes a mistake in answering a question because the student still does not understand about the lesson material.

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Example 2:

(36) *"Nek rak duwe kepandaian otak untuk berpikir bawa alat bantu, kalkulator. Nomer 3 maju ke depan! Aja bodho-bodho."*

"If you don't have ability to think, bring a tool, calculator. Number 3 come forward! Don't be stupid."

The data show that the teacher switches her language into Javanese to insult her student. She switches her language to emphasize her emotion by insulting her student.

4.1.3.3 Emphasizing emotion in disagreement

The expressing of emotion can occurs when someone is not agree with something. The teacher's emotion can be expressed in code-switching. Here are the examples:

Example:

(37) *"Murid: Kok tidak 23 bu?*
Guru: *Yo senenge soale to, kok tidak 23, ya tidak harus, standarnya kan itu, ya* to?

"Student: Why is it not 23 bu?
Teacher: It is up to the question, why is it not 23, it should not, that is the standard, isn't it?"

The data show that the teacher uses Indonesian and Javanese in her utterance. *"Yo senenge soale to"* is Javanese. The teacher switches her language to Javanese to show her expression of emotion. The code-switching occurs when one of her students asks her about question which the formula is not the same as the theory. The teacher answers with the expression of

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emotion in disagreement. She explains that not all the questions have the same formula.

4.1.3.4 Emphasizing emotion in cursing

The teacher tends to use rude Javanese word for cursing in expressing her emotion

Example:

(38) *"Lho kok ana 23, wek'e mbahmu po piye? Wis dihapusi kabeh*!"

"Lho how come it is 23, is it your grandpa's? Clean all!"

The data show that the teacher uses Indonesian and Javanese in her utterance. She uses Javanese sentence to curse her student. The sentence "*wek'e mbahmu po piye"* is common idiom in Javanese to curse someone. The teacher uses that idiom to express her emotion because she is annoyed to her student who makes mistake in answering question.

Example:

(39) *"Maju! Dlongap dlongop. Pira? 2,8 liter berapa mol?"*

"Come to forward! *Dlongap-dlongop*. What is the result? 2.8 liter, how many mol?"

The data show that the teacher uses Indonesian and Javanese in her utterance. She switces her language to curse her student. The phrase *"dlongap-dlongop"* is a Javanese idiom. It

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means someone who do not understand anything. The Javanese people use the phrase *"dlongap-dlongop"* to curse someone who do not understand anything like an idiot. She uses that idiom to expresses her emotion to her student.

Example:

(40) *"Lha kowe geblek rak mudheng-mudheng, tetep maju atau buat seratus kali. Yo cepet, rak mudheng nek bodho ki ngakoni. Nek ra isa ki takon. Nek diterangke nggateke, nek nggak bisa tanya, ndak ada istilah nggak mudheng wong kancane mudheng kok kowe rak mudheng. Pindah aja di SLB"*

"You are stupid, never understand, keep on forward or write one hundred times. Hurry up, if you are stupid and you do not understand, admits! If you cannot do, ask! If I explain, pay attention, if you cannot do, ask! There is no term for not understanding, your friends understand why you do not understand. Move to SLB!"

The data show that the teacher expresses her anger using Javanese and Indonesian in her utterance. She uses Javanese more than Indonesian in expressing her emotion. She seems more expressive when she expresses her anger using Javanese. It is because her mother tongue is Javanese, she feels more convenient to show her emotion in Javanese than in Indonesian. She prefers to express her emotion in Javanese rather than in Indonesian because her mother tongue is Javanese so everything comes out quite easily in Javanese.

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4.1.4 Reason of Teacher's Code Switching in Expressing the Emotion

Based on the interview with the teacher, there are several reasons why the chemistry teacher switches her language from Indonesian to Javanese in expressing her emotion:

1. The teacher considers that Javanese has more word choice for insulting people than Indonesian as seen in the examples below:

   (41) "Pira Fais? Ketemune Pira? Ki ya podo wae podo dhedhel, podo gebleke ning durung maju."

   "What is the result Fais? What is the result? You are as stupid as him, but you has not come forward yet.

   The teacher uses the Javanese words *dhedel* and *geblek* in one utterance. The Javanese words dhedhel and geblek have the same meaning. They same as "stupid" in English. The teacher uses that words to emphasizes her utterance, because she is annoyed to her students.

   (42) "Sakkelas sing bodho dewe ki Bayu. Gedi, pongpongan, D3. Datang. Duduk. Dlongap-dlongop."

   "In this classroom, Bayu is the most stupid one. Big, *pongpongan*. D3. *Datang. Duduk. Dlongap-dlongop*."

   The teacher uses the Javanese words in her utterance for insulting her students. She said that Bayu is the most stupid stupid student. She give him the title *D3*, that refers to *datang, duduk, dlongap-dlongop*. It means, Bayu come to school just for sitting in

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the classroom and he never pay attention to the teacher so he does not understand nothing. The teacher prefers to use Javanese words for insulting her student rather than in Indonesia, because she wants to make different nuance in the classroom.

3. The teacher's mother tongue is Javanese. Then she prefers to swear or curse someone in Javanese rather than in Indonesian as seen in the example below:

> *"Ngono wae kok rak isa. Mol CO2 goblok! Fais sekolah ning nggon SLB C. Kok isa setengah? Delok reaksine!Delok reaksine! Takkon nulis ning ruang guru ping satus kowe! Bener tiga? Gobloke, gobloke."*
>
> "Just doing that, you can not. Mol CO2 stupid! Fais, you study in SLB C. How come it can be half? Look at the reaction! Look at the reaction! I ask you to write a 100 times in teacher office. Three, right? Very stupid."

The teacher prefers to uses Javanese words rather than Indonesian when she is cursing her Student. She uses Javanese such as *gobloke*, that has meaning stupid in English. *Goblok* in Javanese word categorizes into rude word. The Javanese has three level i.e: krama inggil, krama madya, and ngoko. Krama Inggil is the highest level in Javanese. It has the smoothest words. Krama madya is the middle level in Javanese. Ngoko is the lowest level in the Javanese. The Javanese rude words such as *goblok* categorizes into the lowest level of Javanese namely ngoko. The teacher often uses rude Javanese words when she

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curses her student, because she is used to talk in ngoko Javanese.

4.2 Discussion

From the data above, the writer finds that the chemistry teacher in grade ten (X) in SMA Negeri 14 Semarang uses Indonesian, Javanese, and English language in teaching and learning process in the classroom but the most prominent language are Indonesian and Javanese even though sometimes she also uses English. The teacher's primary language (L1) is Indonesian but sometimes she uses Javanese and English as the secondary language (L2) in the classroom. She switches her language from Indonesian into Javanese or vice versa, and from Indonesia into English.

In this finding, the writer finds the writer also indicates that the chemistry teacher, mostly uses the type of metaphorical code-switching during teaching and learning process in the classroom. There are 74 data related to it. The teacher prefers to use metaphorical code-switching because it has some functions. First, she uses it for changing particular topic. She switches her language when she talk something that is not related to chemistry material. Second is for expressing her feeling and thought. She switches her language to insult and reprimand her students. The third is for strengthening her command. She switches her language when she commands her students to do something. Fourth, is for giving emphasize on particular words. She uses it for explaining the particular words. Five, is for exerting her

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power. She uses it to show that she is more powerful by intimidating her students in the classroom.

The other types of code-switching that used widely by chemistry teacher in the classroom is inter sentential code-switching. There are 58 data of inter sentential code-switching found in this study. This kind of code-switching inserting an entire phrase, clause and sentence of the secondary language into primary language. It occurs outside the sentences and clause boundaries. The teacher uses this type of code-switching in the classroom for strengthening the command, for talking something that is not related to the topic, for expressing the feeling and for repetition.

Moreover, the other types of code-switching used by chemistry teacher in the classroom is intra-sentential code switching. There are 39 data of intra-sentential code switching found in this study. This kind of code-switching occurs in a word, a phrase or a clause that found within the sentence in the primary language. It occurs in different position such as initial, middle and end of sentences. The teacher uses this type of code-switching among other for expressing her feeling, for strengthening her command, for insulting the students, for making humor and for clarifying repetition.

Then the writer finds 17 data of tag code-switching in this study. The tag code-switching can be inserted anywhere, which do not have too many syntactic limits. In this finding the tag code-switching occurs at the end of a

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sentence. The teacher uses tag in Javanese with the rest of her utterance in Indonesian language.

The code-switching often occurs because of natural communication. In natural communication, most people are not aware in using their language. Sometime they switch their language because they feel confused with what they want to say, sometimes they influenced the language to their mother tongue. So that, when the teacher talks in the classroom, she often uses more than one language and switches the languages. She switches her languages in conveying the messages.

The teacher switches her language in the classroom to talk about a particular topic. She uses code-switching to mark the formal situation to informal situation. She uses it to change the topic, at the beginning she talks about the lesson, then she switches her language when she wants to talk something that is not related to the topic, for instance: make humor and express her anger. Talking about the lesson is a formal situation while making humor and expressing the anger are informal situation. She switches her language because she feels more comfortable using different language to express it.

In teaching and learning process in the classroom, the using of a word, clause, sentence repetition is very important to give emphasize on some points. Sometimes, the teacher feels the need of citing the saying of native culture to stress the point, for this purpose she switches her language. In this finding, repetition is used to clarify the word, clause or sentence by using

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another language. Moreover, the form of repetition used for clarifying includes in the term of intra-sentential code-switching. The using of the real lexical word depends on the situation. The teacher, sometimes needs a lexical word in her speech to make better sense of the meaning of the word. The teacher also uses it when she does not find the synonym in primary language.

The other function of code-switching is the clarifying the speech content for the interlocutor. The teacher uses it when the students have difficulties to catch the point. So, to make the understand the terms, the teachers usually give more explanation using the detail sentence in the same context to make the students understand about the lesson. In teaching and learning process, the teachers sometimes clarify the unknown meaning of the word by using another language. The teacher usually gives synonym sentence that has the closest meaning to the unknown word.

Code-switching can also strengthen a command since the speaker can feel more powerful than the listener. In the classroom, the teacher uses another language to strengthen a command. She uses it when she is angry, she feels more powerful than her students. To show her power, the teacher switches her language when she commands the student to do something so the students feel hesitate.

To create a friendly environment in the classroom, the teacher uses code switching by making humor, the students respond that humor. She uses it to show her feeling of pleasure. The reaction of the students towards

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teacher's humor indicates a relationship is developed between the teacher and students.

In the classroom the teacher sometimes change the topic for certain purposes. It occurs when she gets emotion to her students, she changes her topic from formal to informal language. Formal situation when she teaches and explains the lesson material, while informal situation when she talks something that are not related to the lesson material such as when she is angry and annoyed to her students. Her mother tongue is actually Javanese, but in the classroom, she talks in Indonesian, because Indonesian is the primary language of education. In the classroom, she talks more in Indonesian than in Javanese.

The teacher uses code-switching to exspres her emotion. The code-switching is an effective way to show the teacher's emotion by using the student's mother tongue. In this way it is also stressed that the utterance of the teacher is seriously meant and expected to be obeyed. In the classroom, the teacher frequently switches her language when she gets angry and annoyed to the students. She switches her language into rude Javanese words in expressing her emotion. The teacher feels more convenient using rude Javanese words for expressing her emotion, but unfortunately she does not realize that she probably hurt people more than she intended to. Based on the interview with the students, the writer finds that the students feel uncomfortable when the teacher expresses her anger using Javanese words

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especially when she uses rude Javanese words. It caused the students feel stupid, ashamed, and humiliated.

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CHAPTER V

CONCLUSION AND SUGGESTION

In this chapter the writer will present the conclusion and suggestion dealing with the data findings of the research.

5.1 Conclusion

Based on data findings and discussion, the writer concludes that the chemistry teacher in grade ten of SMA Negeri 14 Semarang frequently switches her language during teaching and learning process. The teacher often switches her language from Indonesian to Javanese (or vice versa) and sometimes from Indonesian to Javanese (or vice versa).

There are four types of code-switching used by chemistry teacher in the classroom. Mostly, the teacher uses metaphorical code-switching during teaching and learning process. Furthermore, the functions of code-switching used by the chemistry teacher in the classroom are (1) for talking about a particular topic, the teacher switches her language when she wants to talk about something that are not related to the lesson material such as humor and admonition. (2) The teacher uses code-switching for emphasizing on some points of the speech by repeating the words. It is used to ensure that students understand easily with what the teacher has said. (3) For clarifying the speech content. This technique is used to give an easier explanation by using other words or particular indicator so the student easier to catch the point. (4) The

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teacher uses code-switching for providing real lexical words. She uses it because of no equivalent words in the primary language. (5) The teacher also uses code-switching for strengthening a command. (6) The teacher switches her code for creating a friendly environment. It is used to make humor, so the teacher becomes closer to the students. (7) Code-switching used by the teacher for expressing the emotion. The teacher switches her code when she is angry, so it will make different nuance.

The most dominant function of the teacher's code-switching is for expressing the emotion. Code-switching to show the teacher's anger by using the student's mother tongue, so the teacher needs to switch her language. By switching the languge, the teacher shows that her utterance is seriously and expected to be obeyed. There are some roles of teacher's code switching in emotion, e.g. emphasizing emotion in repetition, emphasizing emotion in disagreement and emphasizing emotion in cursing.

The reason of the teacher switches her language from Indonesian to Javanese in expressing her emotion because the teacher thinks that Javanese has more word choice appropriate insulting people. The teacher's mother tongue is Javanese so she prefers to curse or swear in Javanese rather than in Indonesian.

In expressing teacher's emotion especially when she curses her students, the teacher frequently uses Javanese rude words. Those words actually are not appropriate to use in the classroom. The rude words can make

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negative effects for the students and make nuance of the classroom is become strained.

5.2 Suggestions

The writer suggests that the chemistry teacher should not use rude words in the classroom because it can make negative effects for the students. Beside it is not polite and not appropriate for education language, the rude words also makes her students feel afraid of the teacher and ashamed to their friends. If the teacher uses code switching in appropriate way, it can be one of strategic communication in the classroom so the students can enjoy learning chemistry.

Moreover, by using code-switching, the relationship between teacher and students can get closer. Besides, it makes everything be understandable and clear when the teacher explains the lesson materials, gives instruction, or makes a humorous. Furthermore, the writer also expects that the results of this study can be used to enhance the knowledge of linguistics, especially sociolinguistics.

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APPENDIX 2:

Transcript Interview with the Teacher

Writer: Di kelas tadi menegangkan ya Bu?

Teacher: Ha..ha.. takut ya tadi? Anak-anak kalau nggak dimarahi gitu nggak mletik pikirane.

Writer: Apakah Bu Yani selalu marah-marah seperti itu kalau ada anak yang nggak bisa?

Teacher: Ya, begitu itu, kalau saya nggak marah-marah nanti mereka ngremehke. Mereka harus menguasai materinya, sudah tau mau tes kok masih nggak bisa. Kalau saya diem aja mesti podo rak sinau.

Writer: Selama ini kalau bu Yani marah-marah begitu, sikap mereka bagaimana?

Teacher: Ya wis biasa mbak, sudah tau kalau bu Yani orangnya memang seperti ini.

Writer: Ada murid yang tersinggung nggak Bu, misal seperti tadi bu Yani bilang seperti goblok, dhedhel, dan sebagainya?

Teacher: Saya kira nggak ada ya, wong sudah biasa, mereka sudah tau Bu Yani ngomong seperti itu karena memang mereka nggak bisa tapi tidak pernah memperhatikan, ning kelas malah ngantuk, nggak fokus ke pelajaran, ngomong dewe. Lha nek digetak kayak tadi khan ya jadi melek semua, langsung konsentrasi. Kalau di kelas sudah saya kasih kesempatan bertanya, kalau nggak bisa tanya jangan diem saja, kalau diem kan

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artinya sudah paham, lha disuruh mengerjakan kok nggak bisa. Itu berarti mereka kan nggak memperhatikan pelajaran.

Writer: Mungkin anak-anak takut sama bu Yani, jadi mereka malas bertanya.

Teacher: Lha kok takut kenapa, kalau mereka belum mudheng terus tanya kan ya nggak mungkin saya marah. Lha wong sudah dikasih kesempatan lho ya, tadi liat sendiri to. Setelah penjelasan materi nggak ada yang tanya. Saya sudah nyuruh berulang-ulang pada diem, brarti kan sudah mudheng to. Lha kalau saya marah ya wajar, disuruh tanya nggak tanya, disuruh mengerjakan nggak bisa, lha terus piye? Padahal 2 minggu lagi tes, mereka harus menguasai materi. Kalau dari sekarang nggak bisa, nanti tes bagaimana?

Writer: Tadi saya ikut deg-degan di kelas waktu bu Yani marah-marah ha..ha..

Teacher: Ya ngono kuwi mbak, ha..ha..tapi mereka sudah biasa kok, sudah tau maunya bu Yani itu gimana.

Writer: Kalau di luar kelas, sikap mereka bagaimana sama bu Yani?

Teacher: Baik, akrab malah. Kalau diluar kelas ya kadang ngobrol, sering menyapa. Ya biasa saja. Kalau sama bu Panti, mereka malah takut. Apa pernah mereka ngobrol sama bu Panti? Nggak pernah. Nggak pernah akrab juga. Kalau saya kan begitu kan cuma di dalam kelas, di luar kelas ya biasa lagi.

Writer: Bu Yani kalau ngajar enak ya, penjelasannya detail. Cuma ya itu tadi kalau marah bikin deg-degan ha..ha..

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Teacher: Ha..ha..ya memang gitu, njelaske sudah detail saja masih banyak yang nggak mudheng, apalagi sambil lalu ha..ha..Kalau saya memang gitu mbak, materi saya berikan dulu saya jelaskan, contoh-contohnya saya berikan, habis itu baru latihan soal, jadi biar murid-murid terbiasa mengerjakan berbagai macam soal, biar terlatih jadi nggak terpaku sama rumus dan contoh soalnya saja.

Writer: Oya bu, tadi kan bu Yani di dalam kelas pakai bahasa Indonesia dan bahasa Jawa. Nah setelah saya amati ternyata ibu kalau pas emosi atau pas menegur pokoknya kalau ngomong diluar materi pelajaran itu lebih suka pakai bahasa Jawa. Kenapa bu?

Teacher: Ya sudah jadi kebiasaan mbak, sudah otomatis, namanya juga orang Jawa. Lagian kalau marah-marah pakai bahasa Jawa kan lebih enak, kalau pakai bahasa Indonesia kan lebih kaku.

Writer: Maksudnya?

Teacher: Ya kan kalau di bahasa Jawa itu banyak kata-kata yang bisa buat ngonek-ngoneke, ha..ha..kalau bahasa Indonesia kan kata-katanya terbatas jadi lebih formal gitu, kaku. Lebih enak marah-marah pakai bahasa Jawa, lebih santai dan mengena.

Writer: Jadi memang dibedakan ya ketika membicarakan materi pelajaran pakai bahasa Indonesia, kalau diluar itu pakai bahasa Jawa.

Teacher: Kalau pas pelajaran kan sifatnya formal jadi ya pakai bahasa Indonesia, kalau ngomong diluar materi itu kan informal jadi pakai bahasa Jawa

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saja, kesannya juga lebih akrab lebih santai, seperti ngomong sama anaknya sendiri.

Writer: O begitu ya bu, jadi memang bahasanya dibedakan dan sudah jadi kebiasan ya Bu?

Teacher: Iya mbak, sudah biasa.

Writer: Baik Bu, terima kasih informasinya.

Teacher: Sama-sama, nanti kalau ada data yang kurang tanya bu Yani saja mbak.

Writer: Baik Bu.

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APPENDIX 3:

Transcript Interview with the Students

Writer: Dik, mau tanya-tanya nih, bisa nggak?

Student: Tanya apa mbak?

Writer: Suka pelajaran Kimia nggak dik?

Student 1: Suka, tapi susah banget.

Student 2: Nggak suka

Writer: Susah ya. Trus tadi kan yang mengajar bu Yani, menurut adik bu Yani ngajarnya gimana? Enak nggak?

Student 1: Enak tapi galak. Ha..ha...

Writer: Kok nggak suka kenapa?

Student 2: Takut, dimarahi terus kalau nggak bisa, pelajarannya susah lagi.

Writer: Galak ya?

Students: Iya.

Writer: Tapi kalau ngajar gimana?

Student: Ngajarnya enak, tapi suka dimarahi kalau nggak bisa.

Writer: Takut nggak kalau dimarahi gitu?

Student 1: Ya takut, takut kalau pas nggak bisa ngerjain, trus nanti dimarahi di depan kelas, kan malu.

Student 2: Iya, suka dimarahin kalo nggak bisa, jadi tambah grogi.

Writer: Menurut adik, kalau bu Yani marah-marah gitu bagaimana? Kan beliau sering pake kata-kata kasar.

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Student 2: Ya malu sama temen-temen, jadi kalau pas pelajaran kimia suka deg-degan. Harusnya jangan dibilang gitu (dibilang goblok).

Writer: Tapi sudah biasa ya bu Yani kalau ngomong kayak gitu?

Student 1: Iya, sudah biasa sih.

Writer: Kalau di luar kelas, gimana?

Student 2: Biasa sih, baik kok orangnya, nggak kayak di kelas.

Writer: Baik ya, ya sudah terima kasih ya atas infonya.

Students: Ya mbak, sama-sama.

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APPENDIX 1:

Transcript of Conversation

PART 1:

(The Teacher enter classroom)

Teacher: Buka bukunya. PR yang di rumah sudah dikerjakan? Tas-e kok ning kene? Dilihat yang temannya maju ke depan. Biyanto nggak masuk lagi?

Student: Ada Bu.

Teacher: Yang nggak masuk siapa?

Student: Galih Bu

Teacher: Biyanto ndi Biyanto, kowe winginane ning ndi? Hari Kamis. Kamu sama bu Yani sering nggak masuk ya?

Student: Sakit, Bu.

Teacher: Dilihat CH4 ditambah O2 membentuk CO2 ditambah H2O perbandingan koefesiennya 1 berbanding 2 berbanding 1 berbanding 2 ya. Reaksi pembatas yang habis? O2, CO2 habis. Nah dari contoh yang dikerjakan siapa yang belum jelas?

Students: (Silence).

Teacher: Sudah jelas?

Students: Sudah.

Teacher: Sudah jelas?

Students: Sudah.

Teacher: Coba diperhatikan disini, perbandingan koefisien 1 banding 2 banding 1 banding 2, ya to?

Student: Ya.

Teacher: Volume CH4 10 liter, kalau 1 bagian 10 liter, 2 bagian harus 20 liter ya to? Padahal O2 yang ada cuman 8 liter. Boleh tidak?

Student: Tidak.

Teacher: Suatu reaksi berlangsung apabila dia habis semua atau ada sisa, kalo kurang tidak boleh. 1 bagian 10 liter berarti 2 bagian harusnya 20 liter. Berarti kalau CH4 habis tidak mungkin, berarti yang habis O2. 2 bagian 8 liter, berarti 1 bagian 4 liter, padahal CH4 yang ada 10 liter, yang bereaksi cuman 4 liter. Berarti ada sisa sebanyak 6 liter. Jelas?

Students: Jelas?

Teacher: Ada pertanyaan, ada yang mau bertanya?

Students: (Silence)

Teacher: Berarti ini O2 sebagai pereaksi pembatas. Ada yang mau tanya?

Students: (Silence)

Teacher: Ada yang mau tanya? Kalau mau tanya, tanya bu Yani. Siapa yang mau tanya?

Students: (Silence)

Teacher: Ada berapa contoh soalnya? Ada berapa?

Students: 3.

Teacher: LKS-nya buka halaman 59, halaman 59 kegiatan individu soal nomer 3. Maju ke depan. Tanggal?

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Student: 23.
Teacher: Absen nomer 23. Yak. langsung kerjakan maju ke depan halaman 59, Fal maju Fal LKS-nya dibawa.
Teacher: Yang diketahui berapa? Reaksinya? Volume yang diketahui reaksinya berapa?
Students: 1.
Teacher: 1 saja to itu. Berarti lebih mudah, kerjakan di depan saja, podo wae.
Student: (Come forward).
Teacher: C2 H2 ditambah O2 membentuk, kan ngono to, wis ana reaksine. Lha iki wis ana lho ya reaksinya, sing diketahui apa? Tinggal cari apa? Tinggal cari masing-masing reaksinya to itu? C2 H2 ya.. terus cari...volume apa yang diketahui? Wis tulis!
Student: (Still answer the question)
Teacher: Cari volume O2. 2 bagian 6 liter, berarti nek 5 bagian? Ya tulis 5/2 gitu caranya dikali 6. Pira? 18 bener? Pira jadine? 15. Terus volume CO2, kae lho ndelok kene rak sah ndelok kana. O-ne gede, sama dengan 2 bagian 6 liter, berarti nek 4 bagian? Ya wis tulis, pira per pira? Tulis liter, nek taktulisi karung entuk? 15 apa kuwi? O2. Nah Berikutnya volume H2O. Berapa?
Student: 3 Bu.
Teacher: Jadi berapa? 6 liter. Perbandingannya? Yang ditanyakan apa? Perbandingan berapa?
Student: (Silence)
Teacher: C2 H2 berbanding kan gitu to? Ya, berapa banding berapa banding berapa volumenya C22 berapa? 6 berbanding, bisa diringkas nggak? 6, 15, 12.
Students: Bisa.
Teacher: Dibagi berapa semuanya?
Students: (Silence)
Teacher: Dibagi berapa semuanya?
Students: 2.
Teacher: Yak. Jelas? Coba dilihat disini, setelah dihitung jika C2 H2 yang 2 bagian 6 liter, maka O2 setelah dihitung ketemunya 15. CO2-nya 12 liter, H2O nya 6 liter. Perbandingan volume dari reaksi yang terjadi 2 berbanding 5 berbanding 4, berbanding 2, sehingga perbandingan volume sama dengan perbandingan koefisiennya. Jelas?
Student: (Silence)
Teacher: Jelas.? Sesuai dengan hukum?
Students: (Silence).
Teacher: Volume Gaelusar, ya to?
Students: Ya
Teacher: Ada yang bertanya?
Students: (Silence).
Teacher: Ada yang bertanya? Berikutnya. Buka LKS-nya. Halaman 61 soal nomer 5 ada 2A dan B, langsung maju ke depan nomer berapa tadi yang maju?
Students: 23

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Teacher: 2 tambah 3 berapa?
Students: 5.
Teacher: Absen 5 maju nomer 5A, selanjutnya 2 kali 3 berapa?
Students: 6.
Teacher: Ya maju ke depan no 5B, bawa LKS-nya langsung.
Students: (Silence).
Teacher: Absen nomer 5 siapa tadi, ya maju ke depan ayo cepet! Yang 6 ya maju ke depan.
Student: (Come forward)
Teacher: Yang 2A. Volume C22 yang diketahui 2 liter, berarti volume O2 sama dengan 5 liter ya. Kae sing campur-campur dihapus to, nok. Volume CO2, lha kuwi kok uyel-uyelan.Ya. Dicari semua ini! Yang diketahui volume NH3 sama dengan 5 liter, ya to? 4 bagian 5 liter, berarti nek 5 bagian, 5/4 kali 5 sama dengan 6,25 liter, betul to?
Students: (Silence).
Teacher: Volume NO sama. 4 bagian 5 liter, 4 bagian juga 5 liter. H2O 6/4 Ada pertanyaan? Ada yang mau tanya?
Students: (Silence)
Teacher: Ada yang mau tanya?
Students: Tidak.
Teacher: Berikutnya, LKS berikutnya, buka halaman 72 soal nomer 22 sudah dikerjakan?
Students: Sudah.
Teacher: Halaman 73 soal nomer 2 tadi absen nomer 5 dan 6, berarti 6 kali 5 sama dengan?
Students: 30
Teacher: Siapa 30?
Students: Rosi, Bu.
Teacher: Berarti absen nomer 3, siapa absen nomer 3?
Student: (Come forward)
Teacher: Berapa? Disamakan wis 4/3 disamakan to. Lho..lho...piye? Bener apa salah? Sebelah kirinya S berapa? Sing mboksetarakan bawah itu ?
Students: 3.
Teacher: Sebelah kanan berapa ?
Students: 4.
Teacher: Sama nggak?
Students: Nggak?
Teacher: Dihapus semua. Eee...piye? Ngitung kaya ngono kok rak isa. Menyetarakan kok rak isa. Dihapus itu! Rak ana 4/3 ning kono. S sebelah kiri berapa?
Students: 1.
Teacher: Sebelah kanan berapa?
Students: 1.
Teacher: O sebelah kiri berapa?
Students: 4.
Teacher: Yang sebelah kanan ?

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Students: 3.
Teacher: Jadi yang dikurangi yang sebelah mana?
Students: Kiri.
Teacher: Kan kebanyakan to? O2-nya dikalikan berapa supaya 3? Dikurangi berapa? 4 dengan 3 banyak mana?
Students: 4.
Teacher: Dikalikan berapa? Kelebihan berapa?
Student: 1.
Teacher: Berarti supaya 1, sudah ada 2 dikalikan berapa?
Student: 2.
Teacher: Ben siji pira? Nek loro ben siji pira? O2 itu kan sendirian to? Rak mudheng?
Student: Min (-)
Teacher: Ana min (-) barang ki piye? Duduk! Piye? Ngene wae rak isa. Matematikane piye cah, cah? Dilihat disini. S sebelah kiri?
Students: 1.
Teacher: Sebelah kanan.
Students: 1.
Teacher: Sebelah kiri O-nya?
Students: 4.
Teacher: Sebelah kanan?
Students: 3.
Teacher: Karena S- nya sudah sama yang disini jangan diutik-utik, jangan kamu ganti, kan gitu. Brarti kamu ganti yang ini to?
Students: Ya.
Teacher: Kelebihan berapa tadi?
Students: 1.
Teacher: 2 dikali berapa supaya 1?
Students: Setengah.
Teacher: Setengah. Setelah pas dikalikan 2. Jadi ?
Students: 2 SO2 ditambah O2 membentuk 2 SO3.
Teacher: Jelas.
Students: Jelas.
Teacher: Sekarang S sebelah kiri 2 sebelah kanan 2, O sebelah kiri 6. 2 kali 2 tambah 2?
Students: 6.
Teacher: Sebelah kanan.
Students: 6.
Teacher: Siapa yang belum jelas? Kalo ada yang sudah sama jangan diutik-utik, kan gitu. Jadi perbandingan koefisiennya?
Students: 2 banding1 banding 2.
Teacher: Berarti perbandingan volume?
Students: 2 liter banding 1 liter banding 2 liter.
Teacher: Jelas?
Students: Jelas?
Teacher: Ada yang mau tanya? Siapa yang mau tanya?

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Students: (Silence)
Teacher: Diinget-inget ya. Sekarang berikutnya. Contoh soalnya sudah dikerjakan iya to? Sekarang buka LKS-nya tentang Mol. Hitungan kimia berikutnya tentang Mol, sudah ketemu?
Students: Sudah.
Teacher: Perhatikan, ini agak sukar. Mol itu standar hitungan, ukuran yang ada dalam ilmu kimia. Kalau di dalam kehidupan sehari-hari sama aturan-aturannya. Satu lusin berapa biji?
Students: 12.
Teacher: Satu kodi ?
Students: 20.
Teacher: Itu pasti, ya to? Satu lusin pasti isinya 12, Sejinah? Satu jinah berapa biji?
Students: 10.
Teacher: Sejinah isine enem nggak ada. Satu lusin diberi 10 kamu mau?
Students: Nggak mau.
Teacher: Sama hitungan kimia. Mol merupakan standar hitungan yang ada. Semua hitungan kimia yang ada harus dijadikan dalam bentuk mol. Mol disini mempunyai rumus masa. Masa, satuannya apa?
Students: Kilogram.
Teacher: Gram bukan kilogram. Kalau kimia masa satuannya pasti gram.
Teacher: Volume, satuannya?
Students: Liter.
Teacher: Jelas? Mol sama dengan Masa per Ar atau Mr. Ar jika dia wujudnya unsur, sedangkan kalau Mr jika dia wujudnya senyawa.
Teacher: Sebutkan contoh senyawa. Satrio senyawa apa wae?
Student: H2SO4.
Teacher: Lainnya lagi? Banyak, senyawa itu ribuan. Kamu sudah buat kemarin 46, ada NaCl, ada H2SO4. Yang namanya senyawa pasti terbentuk lebih dari 2 jenis, tapi kalau hanya 1 maka disebut dengan unsur. Mol sama dengan Masa per Ar atau Mr. Jadi kalau Masa sama dengan mol dikali Mr atau Ar. Berarti kalau Ar atau Mr sama dengan?
Students: (Silence)
Teacher: Apa? Masa dibagi mol, jelas?
Students: Jelas.
Teacher: Contoh soal. Diketahui. Ar H sama dengan 1, O sama dengan16, sama dengan 32. Masa 2 mol H2O sama dengan 49 gram, H2SO4. Seperti ini. Diketahui molnya, dicari masanya, ya to? Berapa gram? Ada yang bisa? Jadi berapa gram? Cari dulu Mr-nya ya to. Berarti disini 2 kali Mr H2O sama dengan? 2 kali Mr H2O, berapa? Ar H berapa? H2O berapa, atom H?
Students: 2.
Teacher: Berapa atom O?
Students: 1.
Teacher: Berapa atom H?
Students: 1.

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Teacher: Berapa Mr H2O?
Students: (Silence)
Teacher: Sudah diajari belum?
Students: Sudah.
Teacher: Berapa?
Students: 18.
Student: Tenan to.
Teacher: 18. Aja tenan to, tenan to, kalau sudah bisa bilang. Jadi sama dengan 36 gram. Sekarang 49 gram H2SO4. Diketahui masa-nya, dicari mol-nya. Berarti mol sama dengan 49 per Mr H2SO4. Sama dengan? Berapa Mr-nya? Dihitung!
Students: (Silence)
Teacher: Berapa? Cah SMA ngitung ngene kok rak isa piye? Berapa? 96. 2 kali 1?
Students: 2.
Teacher: Ditambah 32 berapa?
Students: 34.
Teacher: Ditambah 30?
Student: 64.
Teacher: Jadi sama dengan?
Student: 98.
Teacher: Jelas?
Student: Jelas.
Teacher: Maju ke depan, tadi terakhir nomer berapa?
Students: 3.
Teacher: Tambah tanggal 23 berapa?
Student: 26.
Teacher: Siapa 26? Yak, maju kedepan. Yok cepat 18 Mr 2 dikali Mr H2O. H2O Mr-nya berapa tadi? 18. Yang B, terakhir berapa tadi?
Student: 26.
Teacher: 2 dikali 6 berapa?
Students: 12.
Teacher: Siapa 12. Ya nomer 12 langsung maju ke depan.
(The bell is ringing)
Students: ha...ha...
Teacher: Besok kan ada tiga jam, tiga jam sakelas maju kabeh.
Students: Halah, ha..ha...
Teacher: Wis wis cepet, pira? Mr SO2 rak isa ngitung? Yo pira? Aduh SMA lho, ngitung SO2 Mr-e wae ra isa, piye? Rumuse durung dihapus ki lho. Jadikan gram. Kok isa? Mol ning gram apa? Piye? Wis diketahui mol-e berarti ke gram-e? Mol ke gram. Ya to. Cari masa-nya. Yang dicari apa?
Students: Masa.
Teacher: Masa to, sama dengan.? Yang lainnya ngerjakan. Kae sing mburi wis nulis rung? Rak ditulis, mendadak bu Yani minta catatan dikumpulkan, tidak ada catatatan lengkap tidak mungkin kamu akan tuntas. Saka ndi belajare, kae malah turonan ndlosor wae. Lha catetan wae kaya gombal

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amoh ngono owk. Duh gusti paringono sabar. Kowe rak nduwe buku, le? Nek sinau piye? Kowe nek takkon ngumpulke apa isa, ki catetane kaya ngene?

PART 2:

Teacher: Selamat siang
Teacher: Kemarin tentang apa?
Students: Kemarin suruh ngerjain Bu?
Teacher: Mol ke gram, gram ke mol, ya buka LKS-nya
Students: Halaman?
Teacher: Halaman, kita kerjakan sama-sama, baru mol, masa, sudah berapa contohnya? 5? 4?
Students: 5, Bu.
Teacher: Sudah bisa ya itu? Bisa to?
Student: Bisa.
Teacher: Sekarang hubungan antara mol dengan partikel. Kalau tidak bisa tanya, jangan bicara sendiri!
Teacher: Bilangan Avogadro, lambanganya L atau N besar, 6,02 kali 10 pangkat 23 partikel, partikel itu menunjukkan bagian terkecilnya. Kalau dia unsur bagian terkecilnya?
Students: Atom.
Teacher: Kalau senyawa?
Students: Molekul.
Teacher: Kalau satu jenis maka dia masuknya atom, kalau lebih dari satu jenis maka dia masuknya senyawa, ya? Sekarang disini 1 mol zat X ini mengandung 6,02 kali 10 pangkat 23 partikel. Kalau 1 mol 6,02 kali 10 pangkat 23. Coba satu lusin berapa?
Students: 12.
Teacher: Kalau setengah lusin dapat?
Students: 6.
Teacher: Kalau 2 lusin berarti dapat?
Students: 24.
Teacher: Jelas?
Students: Jelas.
Teacher: Sekarang dilihat. Kalau 1 mol dapatnya 6,02 kali 10 pangkat 23. Berarti kalau setengah mol dia dapat?
Students: Setengah dikali 6,02 kali 10 pangkat 23.
Teacher: Setengah kali sekian ya to? (pointing the whiteboard). Kalau 2 mol, 2 kali 6,02 kali 10 pangkat 23. Jelas?
Students: Jelas
Teacher: Contohnya, 2 mol NaCl, atom atau senyawa?
Students: Senyawa
Teacher: Berarti bagian terkecilnya apa?
Students: Molekul.
Teacher: Jadi disini 2 kali 6,02 kali 10 pangkat 23 molekul sama dengan 12,04 kali 10 pangkat 23 molekul. Jelas?

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Students: Jelas.
Teacher: Kalau 0,25 mol Cl 2 berarti 0,25 kali 6,02 kali 10 pangkat 23, satuannya?
Student: Partikel.
Teacher: Satuannya? Atom. Kalau unsur, partikel terkecil atom, kalau senyawa, partikel terkecil molekul, jelas?
Students: Jelas.
Teacher: Jadi berapa ini? 1,5 kali 10 pangkat 23 atom. Jelas?
Students: Jelas.
Teacher: Sekarang bu Yani tanya, 6, 02 kali 10 pangkat 23 berapa mol?
Students: 1.
Teacher: 1 mol, berarti kalau 3,01 kali 10 pangkat 23 berapa mol?
Students: Setengah.
Teacher: Jelas. Sudah jelas to? Ada yang mau tanya?
Students: Nggak.
Teacher: Maju ke depan.
Student: Bu, mau tanya.
Teacher: Ayo tanya, tanya yang mana?
Student: Bagaimana caranya menentukan itu? (pointing to white board)
Teacher: Unsur apabila hanya terdiri dari 1 jenis saja, Cl 2 berapa jenis?
Students: 1.
Teacher: Apa?
Students: Cl.
Teacher: Jumlahnya berapa ?
Students: 2.
Teacher: Na Cl berapa jenis ?
Students: 2.
Teacher: Apa saja?
Students: Na dan Cl.
Teacher: Jumlahnya berapa?
Students: 2.
Teacher: 2, Na dan Cl, Na-nya 1, Cl-nya 1, maka dia senyawa. Ada yang tanya? Lainnya? Le..le...kamu le, nek ning warung jegang ngono karo mangan gedang goreng ya.
Students: Ha..ha..
Teacher: Sudah nggak ada yang tanya? Ada 3 soal, maju ke depan. Kalau gram harus dirubah menjadi bentuk mol, kemarin sudah to? Yang sudah bisa, siapa yang mau maju? 3,01 kali 10 pangkat 22.
Students: Kok tidak 23 bu?
Teacher: Yo senenge soale to, kok tidak 23, ya tidak harus, standarnya kan itu, ya to? Tadi bu Yani bilang satu lusin berapa biji?
Students: 12.
Teacher: Berarti kalau 6 biji?
Students: Setengah lusin
Teacher: Dari? Caranya?
Student: Dibagi 2.

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Student: Dibagi setengah
Teacher: 12 dibagi setengah lho..lho.. kok setengah saka ndi? 1 lusin berapa biji?
Student: 12.
Teacher: Kalau 6 biji?
Student: Setengah lusin.
Teacher: Dari...? 6 dibagi 12, ora ana dibagi setengah, Fais..Fais.
Students: Ha..ha.
Teacher: Jelas belum?
Student: Jelas.
Teacher: 1 jinah berapa biji?
Students: 10.
Teacher: 20 biji berapa jinah?
Students: 2.
Teacher: Dari...? 2 kali 10 caranya kan seperti itu. 1 mol berapa partikel?
Students: 6,02 kali 10 pangkat 23.
Teacher: Berarti kalau 3,01 kali 10 pangkat 22, berapa mol?
Students: Setengah mol.
Teacher: Saka ndi? Itu 22 lho ya, bukan 23 lho ya. Angkanya kan berbeda to. Matematikane piye cah. Yo, siapa yang sudah ketemu? Nomer 1. Diketahui disini Ar Me sama dengan 56, H sama dengan 1, O sama dengan 16, C sama dengan 12. Tanggal ?
Student: 23.
Teacher: Siapa? Yo maju ke depan, yo cepet. Ndah, cepet Ndah, digarap ning ngarep podo wae. Berapa mol? Saklusin dua belas, nek enem berarti setengah lusin, kan gitu? Dari 6 per 12 kan gitu? 6,02 kali 10 pangkat 23 sama dengan 1 mol. Berarti kalau 3,01 kali 10 pangkat 22 berapa mol? Piye Ndah..Ndah..piye wis diterangke?
Teacher: 23, 2 tambah 3 sama dengan?
Students: 5.
Teacher: Siapa nomer 5? Ya maju ke depan nomer 2! Yo cepet.
Teacher: Piye Ndah? Bu Yani wis ngomong bantere koyo ngono kok rak krungu piye? Wis diterangke. Saklusin pira, Ndah?
Student: 12.
Teacher: Nek 6 berapa lusin??
Student: Setengah.
Teacher: Darimana? Bodhomu ki lho. Darimana? Lha yo setengah ki saka ndi? Loro-ne saka ndi? Wong rak ana loro kok loro. Bodhone, bodhone, piye? Bodho kok nemen...ne...piye? Ndah..Ndah.. bodhone, piye to Ndah..Ndah? Sesuk balik ning SD kelas 4 wae. Putune bu Yani wae isa ngono kuwi. Nek satu lusin dua belas biji, nek enem ki setengah lusin, entuke saka ndi? Ayo yang nomer 2 maju ke depan? Bodhone kok ya mbangeti to Ndah..ndah..ngono kok ya sekolah to ya..ya.. SMA. Contoh soal wis ana, wis diterangke. Saklusin duabelas nek enem pira? Setengah lusin. Darimana? Kan gitu to. Lha wong SMA kelas siji kok kalah mbek SD. Ayo yang nomer 2 cepet maju. Maju rak sah ndelok-

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ndelok. Ndah..Ndah...gebleke nemen, berapa gram ketemunya? Fal pira..Fal?

Student: Baru ngitung bu.

Teacher: Ayo kalau mau maju. Maju! Bener setengah gitu? Carane saka ndi? Kok isa setengah ki lho. Wong 22, kan yo ana carane to? Mau ditanya sudah jelas? Jawab sudah. Ada yang mau tanya? Nggak tanya, diem saja. Pira? Nomer 2 berapa mol?

Student: 2.

Teacher: 2 mol. Berapa gram ?

Student: 36

Teacher: Bodho-bodho to ki sing maju. Barisan bodho-bodho ki. Lingguhe ngarep kok rak isa. Yang nomer 1 berapa gram?

Student: Tidak menjawab.

Teacher: Berapa mol?

Student: 1 per 20.

Teacher: 3,01 kan setengah. Gram ke mol diapakan? Gantian! Rak isa apa-apa kae Indah ? Nomer siji Ndah..Ndah..ngono rak isa piye? Ayo Ndik, cepetan Ndik! Ayo kamu, telung taun rak bar ngko dhedhel. Podo dhedhele ki. Ayo Ndik, maju, maju!

Teacher: Carane dulu saka ndi? Ngko Indah rak nyandak. 1 per 20 saka ndi. Saka ndi kuwi? Jejere Me sama dengan? Barisan bodho-bodho turun, duduk, deloki kancane! Mulane nek rak ngerti takon, bu saya belum bisa. Dibagi to, dibagi to itu...kok sakmono ki saka ndi?

Student: Saya nggak mudheng bu.

Teacher: Wan maju Wan! Sakdosin rolas, nek enem pira?

Student: Setengah lusin.

Teacher: Setengah lusin dari mana? Ya enam per dua belas, sama seperti itu. 1 mol sama dengan 6,02 kali 10 pangkat 23. Berarti kalau 3,01 berapa?

Student: Ini sekalian bu?

Teacher: Ya, sekalian diisi. Fal, seperempat kali berapa? Kowe mudheng. Indah rak mudheng. Nomer 2 dibaleni maju ke depan!

Student: Siapa bu?

Teacher: Kamu. Siapa yang belum jelas?

Students: (Silence).

Teacher: Sudah 3 ini, siapa yang belum jelas? Tanya bu Yani aja takon kancane!

Student: (Raise the hand)

Teacher: Yang mana? Yang belum jelas yang nomer berapa?

Student: Nomer 3

Teacher: Ini? Sudah dalam bentuk mol belum?

Student: Belum.

Teacher: 1 mol berapa gram? 44. Kan1 mol sama dengan Mr-nya. Klo 11 gram Mr CO2 ada berapa?

Students: 44.

Teacher: 44 itu 1 mol, klo 11 gram itu ada satu mol? Ada nggak?

Students: Nggak ada.

Teacher: Jadi 11 gram jadikan mol dulu. Masa per Mr. Ada nggak kemarin?

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Student: Ada.
Teacher: Setelah ketemu mol baru ditanyakan apa? Partikel. Berarti kalikan Avogadronya, jelas?
Student: Jelas.
Teacher: Kamu mau tanya apa? Yang mana?
Student: 44 darimana?
Teacher: 44 darimana? Mr CO2. CO2 berapa C?
Students: 12.
Teacher: Ar C sama dengan 12, banyaknya O sama dengan 2 kali, 16. Jelas? Lainnya? Ada yang mau tanya? Ada yang mau tanya lagi?
Students: (Silence)
Teacher: Buka LKS-nya, maju ke depan! Halaman 63 soal nomer 1, 2 dan 3. Yang nomer 2 itu ada 2 berarti ada 4 soal. Terakhir nomer berapa?
Student: 30.
Teacher: Berarti absen nomer 3. 3 tambah 3 berapa?
Students: 6.
Teacher: Ya absen nomer 6 maju nomer 1. Sama caranya ya Gus. Bulan 11, 6 tambah 11 siapa?
Student: Elsi.
Teacher: Elsi maju, 2A Elsi.
Teacher: Nek atom ki bagian terkecil saka apa mau?
Student: Unsur.
Teacher: Nek molekul saka senyawa. Masa satuannya gram, berarti nomer 1 cari gram-nya. Elsi maju ke depan cepet! Dadi sing diseneni isa cah akeh ora mung cah bodho tertentu tok. Nomer 1 betul, nek pinter ya cepet. Nomer 2B, 2A betul? Mencari mol partikelnya itu ya CaCo3. Yang B, Elsi nomer berapa tadi ? Nomer absenmu berapa tadi.
Student: 17.
Teacher: 1 tambah 7 berapa?
Students: 8.
Teacher: Yang B. Yang nomer 3 halaman berapa? 63, 6 tambah 3, 9, siapa nomer 9?
Student: Bayu.
Teacher: Ya, kamu nomer 3. Spidole ndi mau? Bayu Pamungkas, kowe siswa opo ledek kethek, nek siswa ki pakeane rapi. Ayo masukkan! Pira kuwi? 1,2 pira? Digawe gampang kan isa kuwi. 10 pangkat 23-nya dicoret-coret ilang to? Terus? 1,2 dibagi 6 berarti 12 dibagi 6 pira? Jadi berapa?
Student: 2
Teacher: 2 kali 10 pangkat?
Student: 23
Teacher: Lho kok ana 23, wek'e mbahmu po piye? Wis dihapusi kabeh. 10 pangkat - 1. Piye? Apa satuane? Mol. Jadikan gram apa mol? 8,1 apa 81, per gram apa? 8,1 gram dibagi Ar. Ar-e pira? Tulis to ya, kok ndelokke bu Yani, emang bu Yani bintang film? Pake kalkulator kalau nggak bisa! Satuane? Berapa partikel ? Berapa atom? Kok isa 1,2 ki

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saka ndi? Mol ning partikel ki tulisane sopo? Sing 11 gram ki mau sapa ya?

Students: Nawal

Teacher: Kuwi, tulisane Nawal kuwi lho ana, mol ke molekul wis ana, sama dengan bawah pira? Bayu!

Student: Belum mudheng Bu.

Teacher: Mbok kowe dimudheng-mudhengke yo tetep rak isa, wong bodho nemen owk. Mosok rumus-rumus wis ana, soal sepuluh wae wis ana kok durung mudheng wae. Mulane nek sekolah aja bodho-bodho. Piyee? 0,2 kali 6,02 wae rak isa? Aduh, kok isa 3 saka ndi? Nggo kalkulator nek rak isa. Enem ping loro pira? Kan ya gitu to? Heh, Loro ping loro, loro. Sesuk ning Johar tuku ping pingan. Dua kali dua berapa?

Student: 4. Ha..ha..

Teacher: 0,4 kali 10 pangkat?

Student: 23.

Teacher: 23? Sing nomboki kowe?

Student: 22.

Teacher: Apa satuane? Apa itu? 27 mau opo? 8,1 gram apa? Ar to? Ar ki senyawa apa atom apa molekul? Kok molekul ki lho? Berapa jenis?

Student: 1, Bu.

Teacher: 1 jenis satuane apa? 10 pangkat pira kuwi? 23?. Wis ..wis.. kaya wong adus ngono piye. Berikutnya Bayu!

Student: Belum mudheng Bu.

Teacher: Nomer berapa? Lha kowe geblek rak mudheng-mudheng, tetep maju atau buat seratus kali. Yo cepet, rak mudheng nek bodho ki ngakoni. Nek ra isa ki takon. Nek diterangke nggateke, nek nggak bisa tanya, ndak ada istilah nggak mudheng wong kancane mudheng kok kowe rak mudheng. Pindah aja di SLB. Kalau ada gram cari Mr atau Ar-nya, ya to?

Teacher: CaCo3 berapa Mr-nya?

Students: 100.

Teacher: Yo, betul? Berapa 8,1 dibagi 27? 0,2 apa 0,3?

Students: 0,3

Teacher: Cari Mr-nya CaCo3. Bayu. Sakkelas kowe rak munggah dewe piye? Ketoke gedhe, bombong ngono piye? Mosok nggoleki Mr wae rak isa. Cari Mr CaCo3. Ben, ora isa, tetep ngadeg rong jam pelajaran. Sudah, buka berikutnya maju ke depan. Halaman....berikutnya...iki Mr CaCo3 rak isa, berapa? 100. Dah terus cari, ditanyakan berapa gram itu CaCo3nya? Wis iki pada karo itu lho, itu podo, tinggal nyonto wae kok rak isa. Piye? Bayu? Cepet! 10 gram CaCo3 sama dengan? Aja bodho-bodho banget no lho, cah gedhe kok pompongan tok ngono piye? Heh deloki wek'e Bangun iki lho! sama dengan...? Mosok rak isa, diganti angka kok rak isa ki piye? Lha kowe kok rak nyandakan, ndlosore rak karuan, diganti angka wae 8,1 diganti 10 mosok rak mudheng, dua tujuh diganti satus kok rak mudeng, ngko nek muni ndak bisa

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saklawase dinengke wae ya tetep nggak bisa. Harus bisa! Lha yo dhedhele nemen to, sepuluh dibagi satus ngono wae kok nggak bisa. Nggo kalkulator nek rak isa! Rak nyandak pikirane! Piye cah SMA ngono kok nggak bisa. 10 dibagi 100 kok nggak bisa, mbangeti. Ayo cepet kancane sing maju durung akeh! Ayo cepet! Ketemunya berapa nomer 3?

Students: Sama dengan 0,602 kali 10 pangkat 23.

Teacher: Ya, kalau 6,02 kali 10 pangkat 22. Sakkelas sing bodho dewe Bayu, gedhe, pongpongan. D3. Datang duduk dlongap dlongop,

Students: Ha..ha..

Teacher: Durung S2 kowe jik D3

Students: S2 apa bu?

Teacher: Siswa sregep. Nek sregep kan pinter. Kowe D3, datang duduk dlongap dlongop. Wong itung-itungan wae rak mudheng. Mbangeti, sepuluh dibagi satus rak isa, tobat aku. Lha kowe nek nduwe pacar apa rak diapusi? Mas jajake, njaluk duit sepuluhewu mbokei satusewu rak disusuki meneng wae. Gusti...paringono sabar. Omahmu ndi Yu?

Student: Tambra.

Teacher: Wis bergizi lho sakjane. Mangane kan iwak terus. Lha kok uteke ndlosor ki mesti kakean welut kowe.

Students: Ha..ha..

Teacher: Kali 10 pangkat? Satuane apa? Karung apa engkrak? Apa grobak? CaCo3 unsur atau senyawa?

Students: Senyawa.

Teacher: Satuane apa?

Students: Molekul?

Teacher: Bener atom?

Students: Salah.

Teacher: Ya aja diantem krama atom kabeh.

Student: Nuklir.

Teacher: Kowe ki wis D3, PDD akeh banget ketoke ora Phd lho.

Student: PDD apa bu?

Teacher: Penurunan daya dengar alias kopoken!

Students: Ha..ha..

Teacher: Ora Phd, PDD penurunan daya dengar alias...?

Students: Kopok. Ha..ha..

Teacher: Wis diterangke, kalau unsur, bagian terkecilnya?

Students: Atom.

Teacher: Kalau senyawa bagian terkecilnya?

Students: Molekul.

Teacher: Senyawa terbentuk dari berapa jenis? Dua atau lebih. CaCO3 berapa jenis Bayu?

Student: Tiga.

Teacher: Apa wae?

Student: Ca, C, O

Teacher: O-nya ada berapa?

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Student: Tiga.

Teacher: Tiga jenis itu ya senyawa maka bagian terkecilnya ya molekul. 10:100, dicoret. Iki ngene lho 0,1. Ora 10 to, Le. Lha kowe nek itung-itungan rak isa, isa diapusi bojomu to kowe.

Teacher: Jelas?

Students: Jelas.

Teacher: Sudah berapa contohnya? Sudah banyak to? Berikutnya Perhatikan disini, kalau kurang jelas tanya ke bu Yani, jangan ke temannya. Tidak ada istilah tidak bisa. Sekarang hitungan kimia yang berikutnya. Volume molar. Sama saja ini. Volume gas X jika diukur pada STP atau 0 derajat Celcius 1 atmosfir atau Standar. Volume molar itu volume gas jika diukur pada suhu dan tekanan tertentu. STP itu Standar Suhu Tekanan. Suhunya Berapa?

Students: 0 derajat celcius.

Teacher: Tekanannya berapa? 1 atmosfir. 1 atmosfir berapa sentimeter Hg?

Students: 76.

Teacher: 1 mol gas X, volume jika STP sama dengan 22,4 liter. Sekarang perhatikan. Kalau 1 mol berisi sebanyak 22,4 liter, klo 2 mol berapa kira-kira?

Students: 44,8.

Teacher: Kalau 11,2 liter berapa mol?

Students: Setengah.

Teacher: Jelas belum?

Student: Jelas.

Teacher: Jelas Bayu?

Student: Jelas.

Teacher: Piye ni? Seperti ini contohnya, 2 mol gas O2 volume sama dengan 2 kali 22,4 liter jadi sama dengan 44,8 liter. Jelas?

Students: Jelas.

Teacher: Berarti 11 gram gas Co2, karena gram harus diubah menjadi bentuk mol. Sama dengan 2 per Mr CO2 dikali 22,4 liter. 11 per 44 kali 22,4 liter sama dengan ¼ 5,6 liter. Jelas?

Students: Jelas.

Teacher: Sekarang, 3,01 dikali 10 pangkat 23 molekul C2H2 volume (STP) sama dengan? Sudah dalam bentuk mol?

Students: Belum.

Teacher: Berarti 3,01 kali 10 pangkat 23 per 6,02 kali 10 pangkat 23 kali 22, 4 liter sama dengan 11,2.

Teacher: Jelas?

Students: Jelas.

Teacher: Siapa mau tanya? Giliran grup ndangdut kae durung maju. Ada yang mau tanya?

Students: Tidak.

Teacher: Berarti ini berapa? 33,6 liter gas CO2, Mr CO2 sama dengan 44, masa-nya berapa? Ini STP jika diukur pada suhu 0 derajat Celcius 1 atmosfir. Berapa? Sudah mol?

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Students: Belum
Teacher: 1 mol berapa liter tadi?
Students: 22,4.
Teacher: 33, 6 lebih besar atau lebih kecil dari 1?
Students: Besar.
Teacher: Jadi, caranya 33,6 per 22,4 ya to? Sama dengan 1,5 mol. Yang ditanya apa? Jadi 1,5 dikali 44 sama dengan?
Students: 66.
Teacher: Jelas?
Student: Jelas.
Teacher: Tulis, maju ke depan! Volume molar ora molor. Ketoke nggon slorog wis akeh regetan cah.
Teacher: Hitungan kimia masih belum selesai ini, masih ada dua lagi. Semua hitungan kimia harus dirubah menjadi bentuk mol. Dikerjakan halaman 71 kalau sudah selesai, soal nomer 11, 13. Nomer 14 sudah dikerjakan Bayu mau, lalu 16. Semua sudah bisa? Kamu? Contohnya sudah 1, 2, 3, 4. Dari mol ke volume molar, dari gram ke volume molar, dari partikel ke volume molar dan dari volume molar ke gram. Sudah selesai?
Students: Belum.
Teacher: Halaman berapa tadi? 71 soal nomer 11, 12 belum ya, 13, 14 sudah dikerjakan Bayu, iya to? Nomer 16. 11, 13, 16. Yo, nomer 11. Terakhir nomer berapa tadi? 9 ya to? tambah tanggal 23 jadi 32, 32 sapa? Yak cari dulu 28 liter berapa mol. 32 yang nomer 13. 3 kali 2 sama dengan 6, sapa 6? 23 tambah 6? 38, 3 tambah 8 siapa?
Teacher: 3 tambah 8 siapa? Yo cepet sithik, kancane akeh sing durung maju. Ora usah ditulis kabeh yo. 2,8 liter sama dengan berapa mol kan gitu. STP. Yo yang 13. 6,2 kali 10 pangkat 22 mosok takon. Molekul berapa liter? Kae kan wis ana contone. Contone wis ana kae lho. Yo cepet sithik. Kalau dalam pembagian hitungan, letter-nya nggak usah dipakai. Lha wis ana contone kok ra isa piye? Darin piye Darin? Nek ditakoni sudah jelas. Sudah. Maju dlongap dlongop. Pira? 2,8 liter berapa mol? Rak isa ki piye? Nggoleki partikel wae Darin ya ra isa. Gusti paringono sabar. 2,8 liter berapa mol? Aja geblek-geblek, durung wae dihapus ki lho! Kalau 1 mol berapa liter?
Student: 22,4.
Teacher: 22,4. Berarti kalau 2,8 ada 1 mol?
Student: Tidak.
Teacher: Bodhone ki lho. Yusrina, Yusrina.
Student: Nisrina.
Teacher: Lha kok dedhele rak karuan, gebleke nemen cah, ngono kok isa ngguyu? Seneng malahan. Gusti paringono sabar. Yusrina 1 mol berapa liter?
Student: 22,4.
Teacher: Lha nek 2,8 ada 1 mol nggak?
Student: Nggak.
Teacher: Jadi piye carane? Mosok, kalau diketahui partikel selalu dibagi Avogadro, kalau diketahui gram selalu dibagi Ar atau Mr. Kalau

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diketahui volume molar selalu dibagi 22,4. Ngono kok rak isa ki piye? Ngono kok do sekolah to ya..ya.. Lha wong soal contoh durung dihapus kok ra isa, tingak-tinguk. Ngono kok rak nyandak padha karo Bayu. Conto rung dihapus. Mulakno nek diterangke ngomong, bu, saya belum jelas. Ditakoni sudah jelas? Sudah. O..lha iki pasangane Bayu pada dhedhele, siji dhedhel loro geblek, pada we, conto wae rung dihapus. Wah nek iki gelare loro PDL karo PDI, penurunan daya lihat, karo penurunan daya ingatan alias ndlosor. Piye? Sebelahe wis ana ki lho Nisrina. 2,8 ya berapa? Nek rak isa ngitung nggo kalkulator! Berapa? 2,8 dibagi 22,4 berapa?

Student: 0,08.

Teacher: 0,08. Terus, cari apa itu? Cari apa?

Student: Masa.

Teacher: Masa?

Student: Masa molekul.

Teacher: Ar atau Mr-nya? Mol sama dengan, piye? Nggoleki Ar wae rak mudheng. Jikuk bukumu. Hei Nisrina bukunya diambil. Ar wis ana lho ya. Ar, Mr wis ana, nek wis ketemu mol-e piye? Berapa Ar-nya? Pira Fais? Ketemune Pira? Ki ya podo wae pada dhedhel podo gebleke ning durung maju. Mol sama dengan? Gram per Ar atau Mr sama dengan apa kemarin? Cari Ar pake rumus gram per Mr, Mr tadi apa tadi, hah? Mr sama dengan masa per mol, ana rak ning catetan?

Students: Ada.

Teacher: Kok rak isa ki piye? Masanya berapa? Ngono ki sakmenit ya nyandak, ngono kok ndadak limang menit ki piye? Pira? Pira Nisrina, pira ketemune? Ana rak ning rumusmu? Mr sama dengan? Ana rak? Nggoleki rumuse wae rak ketemu. Lha kowe ki nyatet apa rak? Mr sama dengan, masa-ne pira? Masa itu satuane apa?

Students: Gram.

Teacher: Gram-e pira?

Students: 4,25.

Teacher: Garek ngleboke tok kok ya rak isa to ya, ya. Berapa ketemunya? Pira, Dik? Pira? Nyilih kalkulator nek rak isa ngitung. 34 bener?

Students: Betul.

Teacher: Pake kalkulator. Ngitung ngono sakmenit to ya, mosok sampe bermenit-menit. Piye? Wong volume molar ana, rumuse ana. Maju ke depan berikutnya? Soal nomer 16, absen nomer 16 siapa?

Student: Sudah bu.

Teacher: 16 tambah tanggalnya 23 sama dengan 39, 3 kali 9 berapa? 27 siapa 27? AB, kerjakan A dan B.

Student: Kok 2 bu?

Teacher: Lha yo soal nomer 16 ada ABCDE to? Kamu kerjakan A dan B. Volume molar ke mol. 27, 2 ditambah 7 siapa 9 sudah? 27 dikurangi 9? 22 Siapa? 22 dikurangi 4 sama dengan 18. Siapa?

Students: Fais ha..ha..

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Teacher: Fais kedepan, bawa LKS-nya. Ya Fais kerjakan soal halaman72 nomer 24. 80 gram, gram jadikan mol, mol jadikan volume.

Teacher: Nek wis hitungan, letter-nya nggak usah dipake ya, mau wis diterangke ya. PDD!

Student: Bu yang 16 yang mana tadi?

Teacher: Yang mana? Soal halaman berapa tadi? 72 soal nomer 24. Heh... bener seperti itu? Nah iki ya pada wae jebul-jebul, wong diketahuine kok 22,4 sik ki lho. Sapa? Naufal, mau bu Yani wis omong kalau yang diketahui volumenya dibagi 22,4, kalau diketahui gramnya dibagi Ar atau Mr. Kalau diketahui partikelnya dibagi 6,02 kali 10 pangkat 23. Ayo Fais maju ke depan, rak isa, nggarap 100 kali, di ruang guru.. Kerjake kabeh! Berikutnya yang C, D, E. Ayo cepet sithik! Jadi yang ditanyakan yang paling kecil. Yang paling kecil mana? Jawabannya?

Student: A.

Teacher: Fais.

Student: Susah bu.

Teacher: Rak ana istilah susah, hitungan kimia sudah diberikan, konsep mol sudah ada semuanya. Dihapus kabeh. Tidak istirahat kalo Fais belum selesai. Ben, ngko nek ana catetan dikumpulkan, Fais rak nduwe contoh soal dan sebagainya. Jangan tanya bu Yani kalau tidak tuntas. Catetan wae ora nduwe, iki ket mau ndlongop wae. Sudah cepet tulis! Dikon maju ket mau-mau yo ora maju. Wis ben to rak istirahat ya karepmu. FE2O3 yang diketahui apa? Fe2O3 berapa gram? Wis goleki! Ar Me sama dengan 56 Ar O sama dengan 16, cari Mr Fe2O3! Ngomong dikon maju rak gelem. Pira Mr–e goleki? Ar Fe berapa tadi? 56. O sama dengan16. Nggoleki Mr wae rak isa ngono kok. Fe-nya ana pira Fais?

Student: 2.

Teacher: Mr-nya Me berapa masing-masing? Bener 56 ditambah 16? Aja goblok-goblok ngono lho. Nggoleki Mr wae rak isa. Diambil catatannya, dilihat Mr-e pira! Aja sakpenake dewe! Gawe Mr wae rak isa ngono. Yang lainnya mengerjakan! Dikon maju ket mau ya rak maju-maju. Nggoleki Mr wae rak isa to Fais, Fais. Adoh-adoh sekolah ning SMA 14. Sekolah ning simpang lima wae kan cedak, SLB C. Daya ingate ndlosor-ndlosor podo. Lha Mr wae rak isa. Berapa Mr-nya ? Fe2O3, berapa? Wong rak tau nulis, catetan yo ra tau nduwe. Leyah-leyeh wae kaya ning warung kopi. 40 pira? Ya terus piye? gram-e pira? Sing diketahui apa? Gram jadikan apa?

Students: Mol.

Teacher: Piye carane Fais? 80 gram. Mol sama dengan piye? Masa-ne pira? Masa-nya berapa?

Student: 80.

Teacher: Pira dadine? Halah Gusti mol-nya siapa setengah itu ? Delok iki! Yang 80 gram milik siapa? Fe2O3, lainnya mikir! Yang ditanyakan apa? Volume-ne sapa? CO2. Sekarang dilihat 2 bagian setengah mol CO2 berapa bagian?

Students: 3.

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Teacher: Ngono wae kok rak isa. Mol CO2 goblok! Fais sekolah ning nggon SLB C. Kok isa setengah. Delok reaksine, delok reaksine. Takkon nulis ning ruang guru ping satus kowe! Bener tiga? Gobloke, gobloke. 2 bagian berapa mol? -

Student: Setengah .

Teacher: Diketahui apa? Duduk! Makanya besok catetan dibawa kumpulkan ke bu Yani, tidak ada alasan kurang atau tidak mencatat. Rak tau nulis, rak tau nduwe catetan, dikira bu Yani tidak tahu. Dilihat setengah mol 2 bagian Mol CO2, rak Mal ya... Nulis rak tau owk. Berarti CO2 yang ditanyakan 3 per 2 kali ½ mol berapa mol? ¾ to, 0,75 mol berapa liter? 0,75 kali 22,4 berapa? 15, 6. Ada jawabannya?

Students: Ada.

Teacher: Pr-nya sampai selesai, dikerjakan sampai selesai. Sudah semua bu Yani terangkan. Semua dikerjakan latihan ulangan akhir semester. Selamat siang.

PART 3:

Teacher: Assalamualaikum...

Students: Walaikumsalam...

Teacher: Berapa soal sudah?

Students: Dua.

Teacher: Saya ulang, diketahui mol Ar H sama dengan 1, O sama dengan16, Al sama dengan 27 dan N sama dengan14, hitung: masa 2 mol Al. Masa satuannya?

Students: Gram.

Teacher: Berarti kamu cari yang gram. Masa sama dengan mol kali Ar. Berarti ini masa sama dengan 2 kali 7 Jelas ini?

Students: Jelas

Teacher: Sekarang mencari mol, kalau mencari mol, ditanyakan mol sama dengan masa per Ar, karena ini senyawa berarti per Mr. Cari dulu, berarti Mr NH3 sama dengan, banyaknya atom N ?

Students: 1.

Teacher: Banyaknya atom H?

Students: 3.

Teacher: berarti 1 kali 14 tambah 3 sama dengan?

Students: 17.

Teacher: Jelas?

Students: Jelas.

Teacher: 64 gram NH 3 sama dengan 64 per 17 sama dengan berapa mol? Ini dibuat 68 biar mudah.

Students: 4 mol.

Teacher: Jelas?

Students: Jelas.

Teacher: 1, 2 maju ke depan. Siapa yang mau maju?

Student: (Come forward)

Teacher: Ya, 36 gram H2O siapa yang mau maju?

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The student: (Come forward).

Teacher: Ya, 2 mol 36 H2O sama dengan 18 itu apanya? 18 itu apanya? Mr- nya tidak 36, bingung? Jadi Mr H2O sama dengan.? Sudah berapa contohnya?

Student: 4.

Teacher: Buka LKS-nya Halaman 62 yang kegiatan individu, masa diketahui, Ar Mr diketahui, mencari mol. Yang mau maju silakan. Mencari mol yang diketahui masa dan Ar atau Mr-nya? Ya, yang sudah bisa maju ke depan. Yok, nomer 1. Siapa yang sudah bisa? Maju ke depan! Cepet. Yang belum maju nanti maju soal-soal yang lain.

Student: (Come forward)

Teacher: Berapa? 0,05 mol. Siapa yang C dan D? Siapa yang mau maju?

Student: (Come forward)

Teacher: Ayo cepet. Pake kalkulator kalo nggak bisa, minjem temannya. Karena IQ ping pinganmu angel banget nek rak isa bawa kalkulator daripada dlongap dlongop. Kimia ki bawa kalkulator, boleh bawa kalkulator, usaha pinjem ato beli sing limangewu apa sing pira. 0,02.. Ngono wae rak isa. Berikutnya.

Teacher: Yang kedua betul. Dari 6 soal yang dikerjakan temanmu di depan, siapa yang belum jelas? Siapa yang belum jelas? Sudah jelas?

Students: Jelas.

Teacher: Jadi diingat-ingat. Kalau yang diketahui masa untuk merubah mol harus dibagi Ar atau Mr, itu wajib. Kalau yang diketahui mol untuk mencari masa ya mol kali Ar atau Mr-nya. Jelas?

Students: Jelas

Teacher: Berikutnya hubungan mol dengan masa sudah, berikutnya hubungan mol dengan partikel. Kembali pada kehidupan kita sehari hari, sejinah dapat berapa?

Students: 10

Teacher: Kalau 5 berarti setengah jinah. Ya to? Kalau 2? 1/5 ya to? Kalau 20?

Students: 2 jinah

Teacher: Satu mol suatu zat X mengandung 6,02 kali 10 pangkat 23 atom atau molekul. Bagian yang terkecil boleh dikatakan partikel, partikel itu bagian yang terkecil. Kalau unsur bagian terkecil atom, kalau senyawa bagian yang terkecil molekul. Kalau unsur hanya 1 jenis ya to? Kalau senyawa 2 atau lebih unsur.

Teacher: Sekarang dilihat disini, bilangan Avogadro lambangnya L atau N. Ini besarnya 6,02 kali 10 pangkat 23. Sekarang dilihat kalau 1 mol 6,02 kali 10 pangkat 23, berarti kalau 2 mol berapa?

Student: 12,04 kali 10 pangkat 23.

Teacher: Kalau 2 mol sekian, kalau setengah mol berarti setengah kali sekian. Berarti kalau misalkan 15,03 kali 10 pangkat 23 atom Na berapa mol?

Student: 2,5.

Student: 3.

Teacher: 2,5 ini kan dibagi, tidak 3. Sudah jelas belum? Mulakno nggawa kalkulator. Ngenekmu ki nggo bagi-baginan rak isa. Dlongap dlongop

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piye? Limalas bagi enem rak isa. Sekarang dilihat disini contohnya, 2 mol H2SO4 sama dengan unsur apa senyawa?

Students: Senyawa.

Teacher: Terdiri dari berapa jenis?

Students: 3.

Teacher: Yaitu?

Students: H, S, O.

Teacher: Berapa H-nya?

Students: 2.

Teacher: Berapa S?

Students: 1.

Teacher: Berapa O-nya?

Students: 4.

Teacher: Jelas?

Students: Jelas.

Teacher: Karena dia lebih dari satu berarti senyawa. Senyawa partikel terkecilnya?

Students: molekul

Teacher: Jadi 2 kali 6,02 kali 10 pangkat 23 molekul sama dengan 12,04 kali 10 pangkat 23 molekul. Jelas?

Students: Jelas.

Teacher: 0,5 mol Na, unsur atau senyawa?

Students: Unsur.

Teacher: Kamu PDD.

Student: Apa itu bu?

Teacher: Penurunan daya dengar.

Students Ha..ha..

Teacher: Alias The Kop.

Students: Ha..ha..

Teacher: Sekarang dilihat disini. Tadi Na apa?

Students: Unsur.

Teacher: Bagian yang terkecil apa?

Students: Atom.

Teacher: Atom Na mengandung berapa partikel?

Students: (Silence)

Teacher: 0,5 kali 6,02 kali 10 pangkat 23 atom. Jadi 3,01 kali 10 pangkat 23. Sekarang berikutnya, tadi 15,03 kali 10 pangkat 22 molekul H2S berapa mol? Tetap sama caranya. 15,03 kali 2 per 6,02 kali 10 pangkat 23.

Student: Kok pangkatnya beda bu?

Teacher: Lha wong iki soal ya saksenengku. Yang penting patokannya ini, kalau ini terserah mau dibuat berapapun terserah, mau dibuat 10 pangkat 25 ya boleh. Berapa, ini kan 2 setengah to brarti 2,5 kali 10 pangkat -1 sama dengan 0,25. Jelas?

Students: Jelas.

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Teacher: Sekarang 11 gram gas CO2, berapa partikel atau langsung aja molekul. Diketahui Mr CO2 sama dengan 44. Dalam bentuk gram, sudah mol belum?
Students: Belum.
Teacher: Harus diubah dalam bentuk mol, harus diubah dalam bentuk mol dengan jalan masa per Mr kali 6,02 kali 10 pangkat 23. Jelas?
Student: Jelas.
Teacher: Kalau ada angka seperti ini harus dibagi, 3,01 kali 10 pangkat 24 per 6,02 kali 10 pangkat 23 kali Ar-nya 32, ya to? Sama dengan 0,5 kali 10 pangkat 1 kali 32 sama dengan 160 gram. Jelas?
Students: Jelas.
Teacher: Ada yang mau tanya? Ada yang mau tanya?
Students: Yang itu bu.
Teacher: Yang mana, yang ini? Dilihat, kalau yang diketahui jumlah partikel selalu jadikan mol. Hitungan kimia selalu dalam bentuk mol, kalau dalam bentuk partikel harus dibagi dengan bilangan avogadronya, ya to? N- nya ini dibagi ketemunya mol, mol ke gram kalikan Ar atau Mr. Yang lainnya ada yang mau tanya?
Students: Tidak
Teacher: Coba tulis, dikerjakan LKS-nya.
Students: (Silence)
Teacher: Sudah selesai?
Students: Belum
Teacher: Kalau sudah selesai kerjakan LKS. LKS halaman 63 Uji kompetensi 1 soal nomer 1,2,3. Sudah Selesai?
Students: Belum.
Teacher: Ayo cepet sithik.Yang sudah bisa maju ke depan, daripada bu Yani tunjuk per tanggal.
Student: (Come forward).
Teacher: Ben nek sing maju Satrio terus ngko Satrio nilaine isa wolung puluhan luwih kuwi, wis rak tau mbolos. Ya betul. 22 atau 23 itu yang 3,01? Kok kali 10 pangkat -1 napa? Kalikan 10 napa? Kuwi 0,02 x 10 pangkat 23 to? Rumuse 20 pira? 23 ya, ora 24. PDL Satrio. Penurunan daya lihat.
Students: Ha..ha..
Teacher: 23 to, Yo. Jadi berapa? 23 sama 23 kan habis to. Nah gitu. Nomer 2 siapa yang bisa? Diki bisa?
Student: Belum bu.
Teacher: Yo siapa? Bu Yani tunjuk harus bisa. Nek rak ditunjuk, ngko rak maju. Wedok-wedoke barang. Tanggal?
Student: 24.
Teacher: Siapa 24.
Student: Tadi sudah bu?
Teacher: 24, 2 tambah 4.
Student: 6.

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Teacher: Ya maju ke depan. Yang nomer 3, 24 tambah 6? 30 siapa 30, ya maju kedepan. Ya cepet. Masih ada 2 jam, kancane rak bar-bar, masih banyak materi.

Student: Nomer 3 bu?

Teacher: Ya nomer 3 maju ke depan, dihapus itu, yang tulisannya bu Yani dihapus itu. Mosok nulis ket mau rak nyandak-nyandak. Yo maju ke depan.

Student: Bu, caranya gimana?

Teacher: Napa? Carane gimana? Wis dikandani lho ya. Nggoleki 10 gram CaCo3 piye? Wis banyak lho tadi 11 gram CO2 wis ana carane. Tadi ndak tanya. Ditanya sudah jelas? Sudah. Moh aku. Gawe! Goleki catetane! Makanya tadi bu Yani tanya sudah jelas? Sudah. Dalam bentuk gram jadikan mol, piye? Mosok lagi takon saiki? Liyane wis tekan Jakarta kowe jik tekan Demak ngono.

Students: Ha..ha..

Teacher: Gram jadikan mol piye, kan wis ana. 1,2 itu seperlima. 0,02. Pira? Ngono ki kok suwine rak karuan cah. Matematika sing mulang sapa kene?

Student: Pak Ikhsan

Teacher: Matematika kok do rak isa ki piye? Piye? 1,2 bagi 0,6 piye? Nek rak duwe kepandaian otak untuk berpikir bawa alat bantu, kalkulator. Nomer 3 maju ke depan! Aja bodho-bodho mosok SMA kalah mbek cah SD. 1,2 berarti 12 kali 10 pangkat -1 dibagi 6,02. 12 bagi 6 pira?

Student: 2

Teacher: 2 kali 10 pangkat -1 jadi 0,2. Caranya gini. Ayo cepet nomer 3! Gram dadeke mol mosok rak isa. Ayo cepet, kesuwen rak bar-bar materine masih banyak. Apa 100 kali duduk aja? Saya hitung 3 kali nggak maju kamu buat 100 kali.

Student: (Come forward)

Teacher: Contone wis akeh, wis ana rumuse, rak tau nyatet apa piye? Makanya kalau pas materinya nggak bisa, tanya. Bu Yani akan terangkan. Aja meneng wae ning bodho! 10 gram CaCo3. Gram jadikan apa?

Student: Mol.

Teacher: Dibagi dengan?

Student: Ar.

Teacher: Mr. CaCo3 kok Ar. Cari Mr CaCo3. Berapa Mr CaCo3?

Student: 40.

Teacher: 40, Dihitung Mr-e CaCo3. Pira dadine?

Student: 48.

Teacher Nah, isa ngono, kok kesuwen napa? 0,1 kali 6. Ngono kok ndadak nganggo orek-orekan. Duh gusti paringono sabar. Matematikane piye? Lha kowe matematika pak Ikhsan diwulang apa? Kowe SMP-ne ndi?

Student: SMP 7

Teacher: SMP 7? Lha, SMP 7 kok dhedhele nemen ki piye?.

Students: Ha..ha..

Teacher: Lulus bejo brarti. 0,1 ping nem wae rak isa.

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Student: 0,6.
Teacher: Ya wis tulis. 0,02. Satuane apa?
Student: Molekul.
Teacher: Piye cah, cah. Matematika, matematika. Boleh ditulis atau ditulis 6,02 kali 10 pangkat 22. Ini kan 10 pangkat -1 kali 6,02 kali 10 pangkat 23. Perkalian pangkat itu kan dikurangi. Sudah. Dibuat yang mudah saja. Ada yang yang mau tanya tentang partikel?
Students: (Silence)
Teacher: Siapa yang mau tanya? Sudah jelas?
Students: Belum
Teacher: Siapa yang mau tanya? Kalau bu Yani tanya, kamu nggak tanya. Kalau maju nggak bisa. Siapa yang mau tanya?
Student: (Raise the hand).
Teacher: Yang mana?
Student: Mencari Mr.
Teacher: Mencari Mr sudah bisa belum?
Students: Sudah.
Teacher: Banyaknya Ca sama dengan1, Ar Ca sama dengan 40. 1 kali 40 ditambah 1 kali Ar C sama dengan 12, ditambah 3 kali 16. Jelas? Lainnya ada yang mau tanya? Sudah Jelas?
Students: Sudah.
Teacher: Contohnya sudah banyak sudah 8. Berikutnya volume molar. Dilihat disini 1 mol gas X volume (STP) atau 0 derajat Celcius atmosfir sama dengan 22,4 liter. 1 mol berapa liter?
Students: 22,4 liter.
Teacher: Jika diukur pada keadaan standar atau STP 0 derajat Celcius 1 atmosfir. Berarti kalau 11,2 liter lebih besar atau lebih keci?
Students: Lebih kecil.
Teacher: Contoh, 11,2 liter gas N2, masanya sama dengan 11,2 per 22,4 kali tanyakan masa, satuannya gram. Kali Mr N2. Satu senyawa unsur tapi ini molekul unsur, ada 2, 2 atom.Sehingga 11,2 per 22,4 kali 8 gram Ar N sama dengan 14. Brarti ada sebanyak berapa gram?
Student: 14 gram
Teacher: Jelas?
Student: Jelas
Teacher: 11 gram gas CO2 Mr sama dengan 44, pada STP, volumenya? Sama dengan 11 per 44 kalau dalam bentuk gram harus dirubah menjadi bentuk Mol dibagi Mr. 44 kali 22,4 liter sama dengan 0,25 kali 22,4 liter sama dengan 5,6 liter. Gram jadikan mol, mol jadikan liter. Jelas?
Student: Jelas
Teacher: Semua jadikan mol. Terus kalau ada lagi 12,04 kali 10 pangkat 23 molekul NH3, berapa liter? Sudah bentuk mol?
Student: Belum
Teacher: Jadi disini 12,04 kali 10 pangkat 23 per 6,02 kali 10 pangkat 23 kali 22,4 sama dengan 44,8 liter, ya to?
Student: Ya

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Teacher: Ada yang mau tanya? Merubah volume molar ke masa, masa ke volume molar, partikel ke volume molar. 0,5 mol gas H2 (STP) Volume sama dengan 0,5 kali 22,4 sama dengan 11,2 liter. Ada yang mau tanya? Sudah Selesai?

Student: Belum.

Teacher: Ya kerjakan soal berikutnya, maju ke depan halaman 64 soal nomer 5, terus halaman 71 soal nomer 8, 9, 11, 13 dan 16. Cepet maju ke depan, materinya selak selesai.

Student: Ya bu ini baru ngitung.

Teacher: Ngitungnya di depan. Untuk hitungan kimia kalau dalam reaksi kalau masih dalam gram harus dirubah dalam bentuk mol.

Student: Sudah, Bu.

Teacher: Berapa?

Student: 44,8.

Teacher: Betul itu?

Student: Betul.

Teacher: Yang halaman 71 soal nomer 8. Ayo cepet maju. Yang nggak mau maju, nulis 100 kali.

Student: (Come forward).

Teacher: Mol ke volume molar itu dikalikan, tidak dibagi. Yang volume molar ke mol tidak dikali tetapi dibagi. Bener? Kalau kali mosok dikali. Sapa sing ngajari? Wis ana contone beberapa. Isa kali 26 sapa sing ngajari? Mulakno nek diterangke ki digatheke, nek rak ngerti takon. Kuwi kok 4,25 saka ndi? Cari mol-nya dulu ora masa molekul. Ben, nek arep maju, maju sendiri ben utheke mikir rak kakean nyonto wae. Wis kuwi berapa mol kuwi? Pake kalkulator nek utheke rak nyandak. Trus bawahnya mol sama dengan apa? Ngono kok rak nyandak piye? Apa mau rumuse? Kowe nggoleki apa? Dibaca soalnya? Mencari apa? Masa molekul itu apa? Mr, mol sama dengan? Mencari Mr piye? Mencari masa piye? Kan gitu to. Mol-e pira? Lha ndi wis mboktulis? Mulakno tulis dulu mol sama dengan masa per? Lha ngono kan cepet rak ana sakmenit, tinggal dimasuk-masukkan. Mol nya berapa, masanya berapa? Berapa ketemunya? Berapa?

Student: 28.

Teacher: Iki bener apa salah? Betul itu?

Students: Betul.

Teacher: Yang berikutnya menghitung volume pada suhu dan tekanan tertentu. Contohnya LKS halaman 71 soal nomer 12. 1,6 gram CH4 diukur pada suhu 27 derajat C, tekanan 2 atmosfir. Ingat disini tekanan atmosfir, atau 76 cm Hg, dimana 1 atmosfir sama dengan 76 Cm Hg. Jawabnya: 1,6 gram CH4 sama dengan Masa harus diubah menjadi bentuk mol dengan jalan dibagi Mr CH4 sama dengan 1,6 per 16 sama dengan 0,1 mol. Lalu P-nya 2 atmosfir, T-nya sama dengan 27 ditambah 273 berarti 300 derajat Lg, Berarti P p sama dengan Mrt V sama dengan 0,1 kali 0,082 kali 300 per 2. Ditulis soal berikutnya.

(The bell is ringing)

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Teacher: Nanti yang berminat untuk US (Ulangan Sekolah) nya bisa, mau tambah dengan bu Yani bisa. Setelah pulang sekolah. Yang pengen, menghubungi Satrio, Satrio menghubungi bu Yani. Selamat Siang.

PART 4:

Teacher: Selamat Pagi.

Students: Selamat pagi bu.

Teacher: Kemarin sampe mana? Perhatikan disini, kamu tau CH COOH kalau dia terhidrolisis H ditambah nya 1 tidak 4, jadi akan menghasilkan ion acetat CH3 COO- ditambah H nya cuman 1. Kemarin sudah bu Yani katakan n B 1 M 1 N 1. N adalah jumlah ion H ditambah atau OH min yang dilepaskan. Disini volume n berapa?

Student: 0,1N

Teacher: Lalu 20, 19, 21 berarti volume rata-rata NaOH sama dengan 19 ditambah 20 ditambah 21 dibagi 3 sama dengan 20. Jelas?,

Students: Jelas

Teacher: P 1 M 1 N 1, P 2 M 2 N 2. Ingat, kalau ada kata-kata dititrasi atau dititir atau dinetralkan itu harus pake rumus ini . Jelas? P1-nya 20, M1-nya 0,1 P2-nya 25, M2-nya yang dicari, N2-nya 1 , Jadi 2 sama dengan 25 M per 25. Jelas?

Students: Jelas.

Teacher: Berikutnya. Maju ke depan, bisa ya? Soal nomer 3 halaman 30, halaman 56 oh 50, soal nomer 2 eh nomer berapa? Nomer 3. Sudah, maju ke depan yang bisa, ada 2 soal dulu. Halaman 30 soal nomer 3 halaman 50 soal nomer 3 juga.

Student: (Come forward).

Teacher: 15? 5 ditambah 4,9 ditambah? Dibagi? M-nya M besar bukan kecil, yang lainnya halaman 75 soal nomer 10, soal nomer 11, yang bisa langsung maju ke depan. Halaman 78 soal nomer 2. NaOH berapa koefisiennya? Yang sebelah kiri apa itu? O, yang ditanyakan. H2SO4, N-nya 2, Volumenya 10, 20 ketoke salah dadine, 20 M sama dengan 0,5 gitu to? Itu atasnya ditambahi M, sama dengan. Basa bervalensi 2. Berarti OH-nya 2, M-nya 2, betul?

Students: Betul

Teacher: Cari basanya ini? Ya 0,05 M, satunya basa 25 mililiter, M 1-nya ditanyakan M-nya 2, betul, asamnya 25 0,1.1, ya betul. Ada yang masih bingung? Ada yang masih bingung?

Students: Tidak.

Teacher: Pokoknya kalau asam kuat, basa kuat Ph selalu 7, klo basa kuat asam lemah Ph-nya pasti diatas 7 koekuivalennya diatas 7, kalau asam kuat basa lemah koekuivalennya harus dibawah 7. Yak betul, lainnya lagi yang bisa? Yang belum, yang halaman 75 dilihat lagi. Nanti kalau dari 78 ini bisa menentukan a. Persamaan reaksi, b. Molaritas, c. Ph, Ph masing-masing dan Ph setelah campur. SO4, O-nya besar, H2O, O-nya juga besar. Itu H20. Sudah setara belum?

Students: Belum

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Teacher: Harus disetarakan dulu. Namanya persamaan reaksi harus setara. Yang a. Na sebelah kanan berapa?
Student: 2.
Teacher: Yang sebelah kiri berapa?
Student: 2
Teacher: H sebelah kiri berapa?
Student: 2
Teacher: Sama to itu? Sudah jelas? Siapa yang belum jelas?
Students: (Silence).
Teacher: Ada yang mau ditanyakan? Temanmu yang maju sudah 4, sekarang yang nomer 11 halaman berapa tadi? 75. Titik netral jika jumlah milimol asam sama dengan jumlah milimol basa, tadi sudah to? Jadi mana yang sama? Yang satu volumenya NAOH, 1 mili konsentrasinya 0,05, yang HCl berarti jawabannya yang sama 0,075. Kalau netral itu jumlah milimol asam sama dengan jumlah milimol basa. Sudah semua ya? Kita lanjut pada pokok bahasan selanjutnya, buka LKS larutan penyangga. Sekarang bu Yani menerangkan bufer. Kalau nggak bisa tanya, agak sukar ini. Bufer atau penyangga atau dapar. Jadi kalau dalam soal kemungkinan ada soal penyangga, bufer, atau dapar. Sama saja. Larutan bufer adalah suatu larutan yang dapat mempertahankan harga Ph-nya jika ada penambahan sedikit asam, basa atau diencerkan. Jadi seperti ini kalau Ph-nya 6 ditambah asam sedikit ditambah basa sedikit atau diencerkan maka Ph-nya akan tetap berkisar 6, tidak mengalami perubahan Ph. Larutan bufer terbentuk apabila suatu campuran terjadi pada asam lemah dengan garamnya. Contohnya, CH3 COOH dengan CH3 COONa, bisa seperti ini. Terus HCN dengan ACN seperti ini dikatakan bufer, bufer itu asam lemah dengan garamnya. Garamnyapun yang ada hubungannya dengan asam lemah. Adalagi H2 CO3 dengan NH2 CO3 ini juga bufer. Bufer terjadi apabila dalam reaksi ada sisa asam lemah. Jadi disini dalam reaksi antara asam lemah dengan basa kuat terjadi sisa asam lemah. Kemungkinan yang pertama seperti ini. Bufer juga terjadi pada yang lain. Yang lain itu adalah basa lemah dengan garamnya contoh: NH4OH dengan NH4CL, basa lemah dengan asam kuat, ya to? Lalu misalkan NH4OH dengan NH42 kali SO4. Ada yang mau tanya?
Students: (Silence).
Teacher: Berarti disini dalam reaksi antara basa lemah dengan asam kuat terjadi sisa basa lemah. Jelas?
Student: Jelas.
Teacher: Jadi disini kalau ada sisa, sisanya asam berarti sifatnya asam, rumus yang digunakan sisa asam konsentrasi H ditambah sama dengan Ka kali mol atau milimol asam sisa per milimol garam. Jelas?
Student: Jelas.
Teacher: Selalu terjadi sisa asam lemah? Ada yang mau tanya dulu?
Student: Tidak.

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Teacher: Yang satunya, jika basa lemah sisa ya, konsentrasi OH- sama dengan Kb kali milimol basa sisa per milimol garam. Jelas? Siapa yang mau tanya? Ada yang mau tanya?

Students: (Silence)

Teacher: Yang mau tanya silakan tunjuk jari, bu Yani ulang. Larutan bufer adalah suatu larutan yang dapat mempertahankan harga Ph. Sudah?

Students: Belum bu.

Teacher: Contoh soal. Buka LKS, soal halaman 36 soal nomer 4, sudah ketemu?

Students: Sudah.

Teacher: Halaman 36 soal nomer 4 ada beberapa contoh soal, tipe yang pertama kamu harus menuliskan reaksinya, belum diketahui garamnya, yang baru diketahui asam lemah dan basa kuatnya, dihitung sama seperti tadi waktu reaksi dan hasil reaksi. Berapa milimol asam lemah, berapa milimol basa kuatnya. Yang habis siapa? Kalau ada sisa asam lemah dia bufer, kalau ada sisa basa lemah maka dia bufer, tetapi soal yang lain kemungkinan dalam bentuk asam dan garamnya. CH3 COOH dengan CH3 COONa sudah membentuk garam tinggal dimasukkan. Cari milimol masing-masing baru dimasukkan konsentrasi Hditambah sama dengan Ha kali milimol asam per milimol garam. Jelas?

Students: Jelas.

Teacher: Soal yang ini yang reaksi dulu. Ka sama dengan C6 asam benzoat, 6 kali 10 pangkat -2 volume 100 ml. C6H5 COOH berapa M?

Student: 0,2.

Teacher: 0,2 M. Satunya lagi 100 ml NaOH, NaOH sama dengan 100 kali 0,2 sama dengan 20 milimol. Ini 100 kali 0,1 sama dengan 10 mili. Direaksikan NaOH ditambah C6H5 COOH membentuk C6H5 COONa ditambah H2O. Jelas ini? Siapa yang mau tanya dulu, sudah setara belum?

Students: Sudah.

Teacher: NaOH-nya 10, maka yang habis siapa? NaOH, ini habis, ini sisa 10, sisa asam lemah dengan garamnya ya to? Maka konsentrasi H ditambah sama dengan Ha kali milimol asam sisa per milimol garam. Ka-nya 6 kali 10 pangkat -5. 10 per 10. Jadi Ph 5-56.

Teacher: Jelas?

Students: Jelas.

Teacher: Siapa yang mau tanya, tunjuk jari? Ada yang mau tanya?

Students: Tidak.

Teacher: Coba dilihat halaman 37 soal nomer 3.Yang merupakan penyangga nomer berapa?

Student: Nomer 4.

Teacher: Jelas? Belum jelas?

Students: Belum?

Teacher: Tadi kan sudah dijelaskan bu Yani. Larutan bufer adalah larutan yang dapat mempertahankan harga Ph-nya, berubah hanya sedikit sekali jika ada penambahan asam, basa atau pengenceran tambah air. Kalau yang nomer 4 ditambah air Ph-nya 4,75, ditambah asam Ph-nya 4,76,

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ditambah basa Ph-nya 4,76. Tidak ada perubahan yang berarti maka dia adalah bufer. Jelas?

Students: Jelas.

Teacher: Selamat siang.

Students: Siang Bu.

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