

ANALISIS NIKEL MENGGUNAKAN METODE UJI NODA DENGAN PENGKHELAT DIMETILGLIOKSIM

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RINGKASAN

Nikel merupakan salah satu logam yang banyak digunakan untuk industri *electroplating*. Penggunaan nikel secara berkala dan terus menerus dalam industri tersebut akan menimbulkan dampak terhadap pencemaran lingkungan, terutama air. Metode yang biasa digunakan untuk mengidentifikasi dan menentukan kandungan nikel adalah metode spektroskopi serapan atom (SSA) dan metode gravimetri. Namun, kedua metode ini mempunyai kelemahan yaitu membutuhkan biaya analisis yang tinggi, hanya dapat dikerjakan di laboratorium dan tidak ekonomis. Metode uji noda merupakan metoda analisis untuk mengidentifikasi ion dalam campuran atau sampel dengan melihat perubahan warna yang terjadi, karena hampir setiap ion mempunyai karakteristik warna yang berbeda-beda bila direaksikan dengan zat pengompleks tertentu. Metoda uji noda merupakan metode yang cukup sederhana, tidak membutuhkan prasarana yang rumit, dan dapat langsung diaplikasikan di lapangan.

Penelitian telah dilakukan untuk mengetahui kandungan nikel dalam sampel dan mengetahui interaksi antara silika gel dengan dimetilglioksim. Sebelum dilakukan uji noda, untuk analisis ion nikel dalam sampel terlebih dulu dilakukan analisis dengan menggunakan metode gravimetri. Uji noda dilakukan pada silika gel dan kertas saring menggunakan pengompleks dimetilglioksim membentuk kompleks yang berwarna merah. Kemudian untuk mengetahui interaksi silika gel dengan dimetilglioksim, silika gel dikerok dari plat uji noda dan dianalisis dengan FTIR.

Hasil penelitian dapat disimpulkan bahwa konsentrasi ion nikel dalam sampel menggunakan metode gravimetri sekitar 40 ppm, demikian juga menurut hasil uji noda. Dari hasil analisis FTIR menunjukkan bahwa tidak terjadi interaksi kimia antara silika gel dan dimetilglioksim.

SUMMARY

Nickel is one of metals which is widely used in electroplating industry. Periodic and continuous use of nickel in industry may pollute waters in our environment. Gravimetric and Atomic Absorption Spectroscopy (AAS) methods are mostly used to identify and to determine nickel content. However, these two methods have some disadvantages such as they require a high analysis cost and are only feasible in laboratory. Spot test is an analysis method to identify ions in a mixture or sample by observing color change of the mixture or sample. This test is done because almost all ions have different colors when they are reacted with a specific complexing agent. Spot test method is simple, do not need such a complicated tool and can directly be applied on field.

A study had been conducted to find out nickel content in a sample and to find out the interaction between gel silica and dimethylglyoxime. Before spot test was done, the sample was previously analyzed for its nickel ion content by using gravimetric method. Spot test was conducted on silica gel and filter paper using dimethylglyoxime as the complexing agent, which then formed a red-colored complex. Subsequently, to find out gel silica interaction with dimethylglyoxime, gel silica was rubbed off from the spot test plate and was then analyzed by using FT-IR method.

The research data concluded that the concentration of nickel ion in the sample measured by gravimetric method was approximately 40 ppm. On the other hand, spot test also resulted in the same number of the ion concentration. From FT-IR analysis, it could be showed that there was not any chemical interaction between gel silica and dimethylglyoxime.

DAFTAR PUSTAKA

- Alexeyev, V.N., 1979, *Quantitative Analysis*, MIR Publishers, Moscow
- Afiatun, E., Wahyuni, S., Rachmawaty, A., 2004, Perolehan Kembali Cu dari Limbah Elektroplating dengan Menggunakan Reaktor Unggun Terfluidasi, *Infomatek*, Universitas Pasundan
- Christian, G.D., 1986, *Analytical Chemistry*, John Wiley and Sons Inc., New York
- Cotton, F.A., Wilkinson, G., dan Gauss, P.L., 1987, *Basic Inorganic Chemistry* John Wiley and Sons Inc., New York
- Day, R.A dan A.L Underwood, 1986, *Analisa Kimia Kuantitatif*, Edisi Kelima, Erlangga, Jakarta
- Dufour., 2006, *An Introduction to Metallurgy*, 5th edition, Cameron, IX-1
- Feigl, F., 1958, Spot Tests in Inorganic Analysis, *Elseiver*, Amsterdam
- Friest, J., dan Getrost H., 1975, *Organic Reagent for Trace Analysis*, E. Merck Darmstadt, Darmstadt
- Gould, E.S., 1955, *Inorganic Reactions and Structure*, Holt, Rinehar and Winston Inc, New York
- Harliana, I., 2005, *Analisis Besi dalam Air Sumur Menggunakan Metode Uji Noda*, Skripsi 2005, Jurusan Kimia FMIPA Undip, Semarang.
- Heftmann, E., 1992, Journal of Chromatography Library-Volume 51A, Chromatography 5th Edition, Fundamentals and Applications Of Chromatography and Related Differential Migration methods, *Elsevier Science Publishing Company Inc*, NewYork
- Hendayana, S., Kadarohman, A., Sumarna, AA., dan Supriatna, A., 1994, *Kimia Analitik Instrumen*, IKIP Semarang Press, Semarang
- Jorgensen, S.E., 2000, Nickel of Pollution Abatement: Pollution Abatement for the 21st Century, *Elsevier Science Ltd.*, Oxford
- Jungreis, E., 2004, *Spot Test Analysis*, 2nd Edition, Culinary and Hospitality Industry Publications Services
- Kolthoff, M., sandal, E.B., Meehan, E.J., and Bruckenstein, S., 1969, *Quantitative Chemical Analysis*, The Macmillan Company, London

- Potter, Clifton., 1994, *Limbah Cair Berbagai Industri di Indonesia: Sumber, Pengendalian dan Baku Mutu* , Project of the Ministry of State for the Environment, Republic of Indonesia and Dalhousie University: Canada
- Pandav, C.S., Arora, N.K., Krishnan, A., Sankar,R., Pandav, S., dan Karmakar, M.G., 2000, Validation of Spot-testing Kits to Determine Iodine Content in Salt, *World Healt Organization*, India
- Stoeppler, M., 1992, *Hazardous Metals in the Environment*, Elsevier, Amsterdam
- Svehla, G., 1990, *Vogel's Textbook of Macro and Semimicro Qualitative Inorganic Analysis*, Longman London
- Weast, R.C., and Lide, D.R., 1969, *Handbook of Chemistry and Physics*, CRC Press Inc., Florida