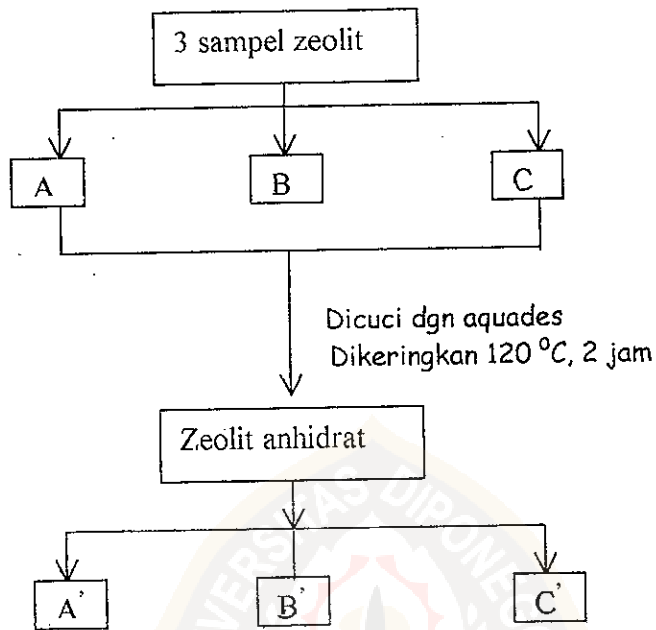


Lampiran 1

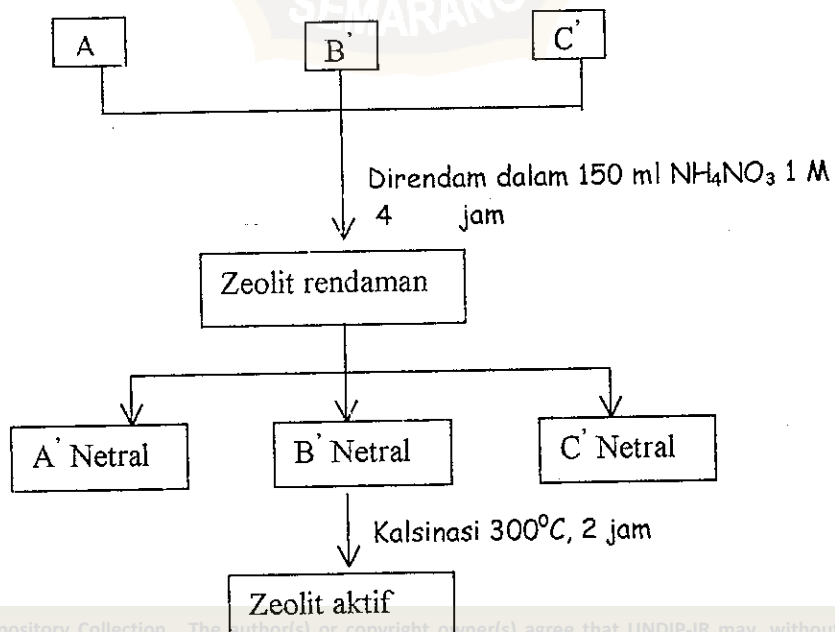
DIAGRAM KERJA

I. PREPARASI SAMPEL ZEOLIT

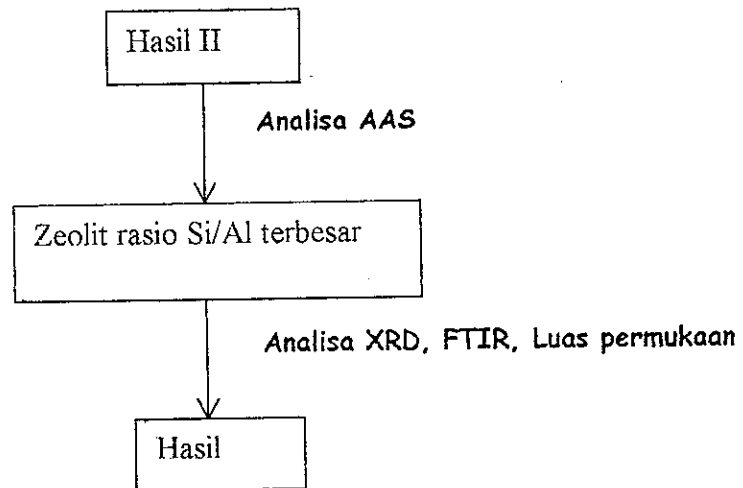


II. PERENDAMAN ZEOLIT DAN KALSINASI

Masing-masing 50 gram hasil I



III. KARAKTERISASI HASIL



LAMPIRAN 2

Penghitungan rasio Si/Al

- ◆ Berat logam dalam miligram
- ◆ BA Si = 28,09 Al = 26,98

1. Zeolit Cipatujah

Sebelum dealuminasi

$$\text{Si} = \frac{166.616}{28.09} = 5931,506 \text{ m mol}$$

$$\text{Al} = \frac{21600}{26,98} = 800,593 \text{ m mol}$$

$$\frac{\text{Si}}{\text{Al}} = 7,409$$

Sesudah dealuminasi

$$\text{Si} = \frac{169.309}{28.09} = 6027,376 \text{ m mol}$$

$$\text{Al} = \frac{4900}{26,98} = 181,616 \text{ m mol}$$

$$\frac{\text{Si}}{\text{Al}} = 33,187$$

$$\begin{aligned} \text{Pengurangan Al} &= \frac{21600 - 4900}{21600} \times 100\% \\ &= 77,31\% \end{aligned}$$

2. Zeolit Bayah

Sebelum dealuminasi

$$\text{Si} = \frac{165.921}{28,09} = 6027,376 \text{ m mol}$$



$$\text{Al} = \frac{6677}{26,98} = 247,479 \text{ m mol}$$

$$\frac{\text{Si}}{\text{Al}} = 23,86$$

Sesudah dealuminasi

$$\text{Si} = \frac{169.399}{28,09} = 6030,580 \text{ m mol}$$

$$\text{Al} = \frac{12.630}{26,98} = 468,1247 \text{ m mol}$$

$$\frac{\text{Si}}{\text{Al}} = 12,88$$

$$\begin{aligned} \text{Penambahan Al} &= \frac{12630 - 6677}{12630} \times 100\% \\ &= 47,13 \% \end{aligned}$$

3. Zeolit perdagangan

Sebelum dealuminasi

$$\text{Si} = \frac{167.080}{28,09} = 5948,024 \text{ m mol}$$

$$\text{Al} = \frac{17170}{26,98} = 636,397 \text{ m mol}$$

$$\frac{\text{Si}}{\text{Al}} = 9,346$$

Sesudah dealuminasi

$$\text{Si} = \frac{176.126}{28,09} = 6270,660 \text{ m mol}$$

$$\text{Al} = \frac{13860}{26,98} = 513,714 \text{ m mol}$$

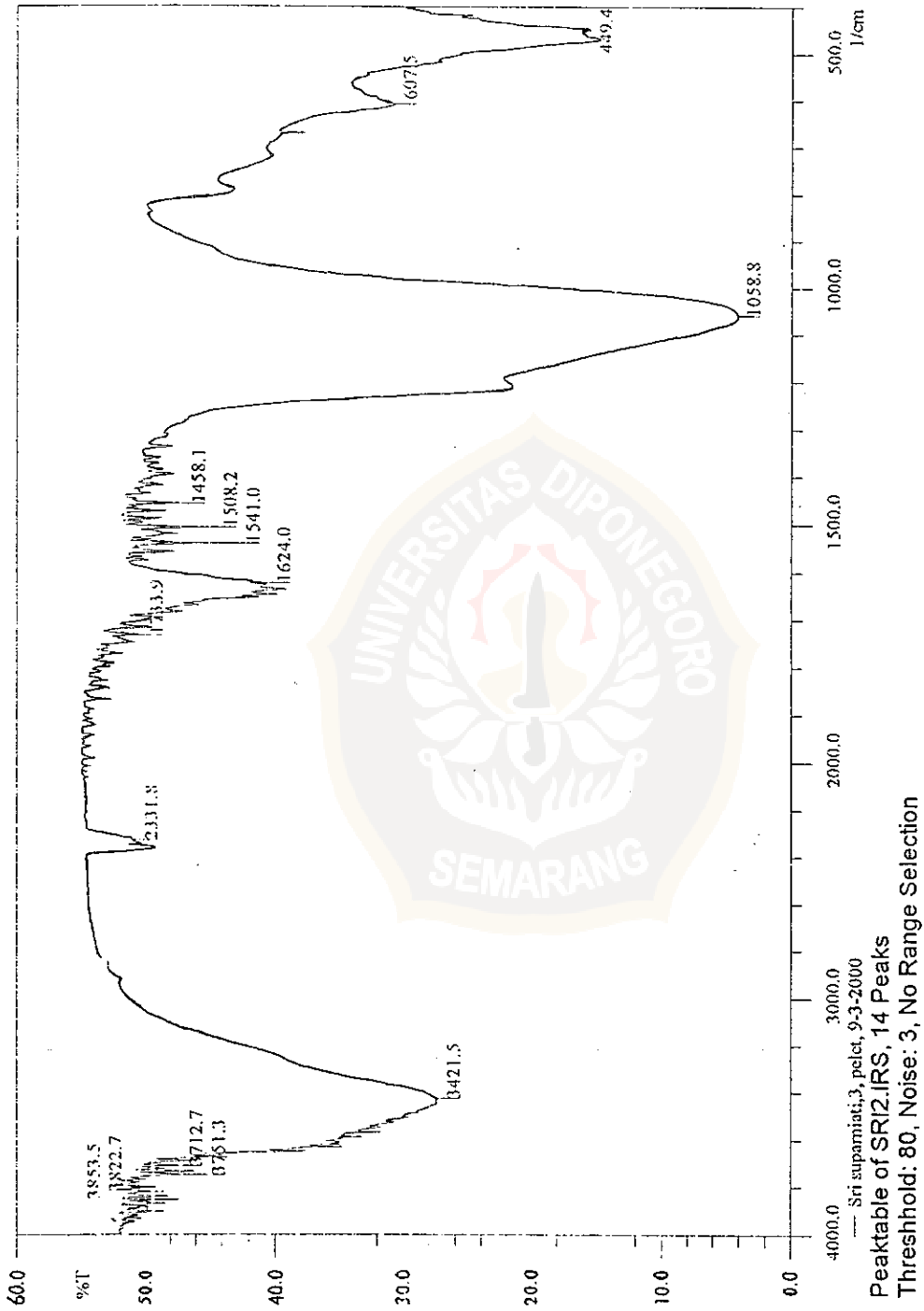
$$\frac{\text{Si}}{\text{Al}} = 12,205$$

$$\begin{aligned} \text{Pengurangan Al} &= \frac{17170 - 13860}{17170} \times 100\% \\ &= 19,27\% \end{aligned}$$



LAMPIRAN 3

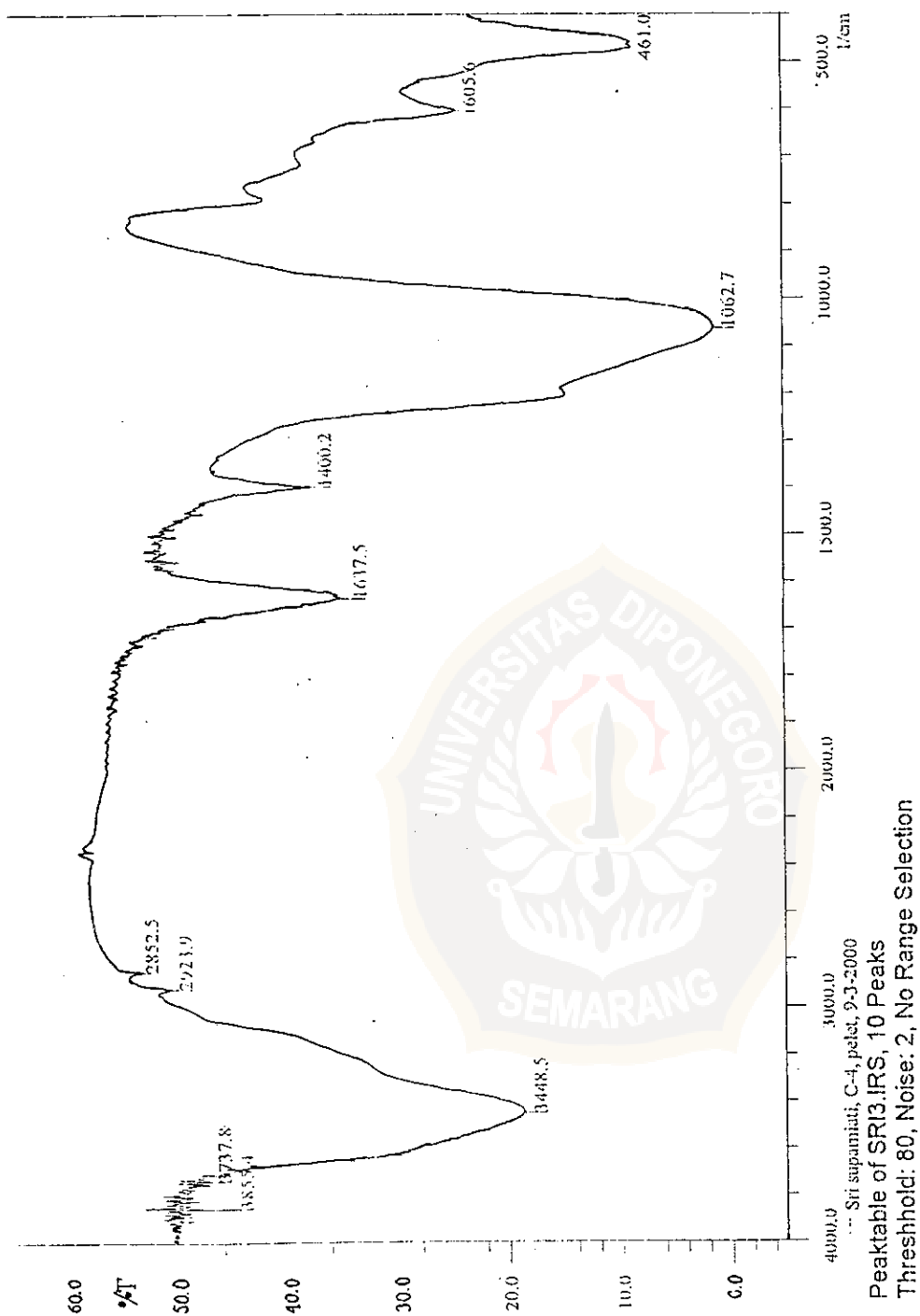
HASIL ANALISA FTIR



Spektrogram Zeolit Cipatujah Sebelum Perlakuan

Nr.	Pos. (1/cm)	Inten. (%T)
1	449.4	15.584
2	607.5	30.727
3	1058.8	4.145
4	1458.1	47.016
5	1508.2	44.623
6	1541.0	46.152
7	1624.0	40.553
8	1733.9	50.270
9	2331.8	50.731
10	3421.5	27.324
11	3712.7	47.140
12	3751.3	46.643
13	3822.7	48.491
14	3853.5	47.181





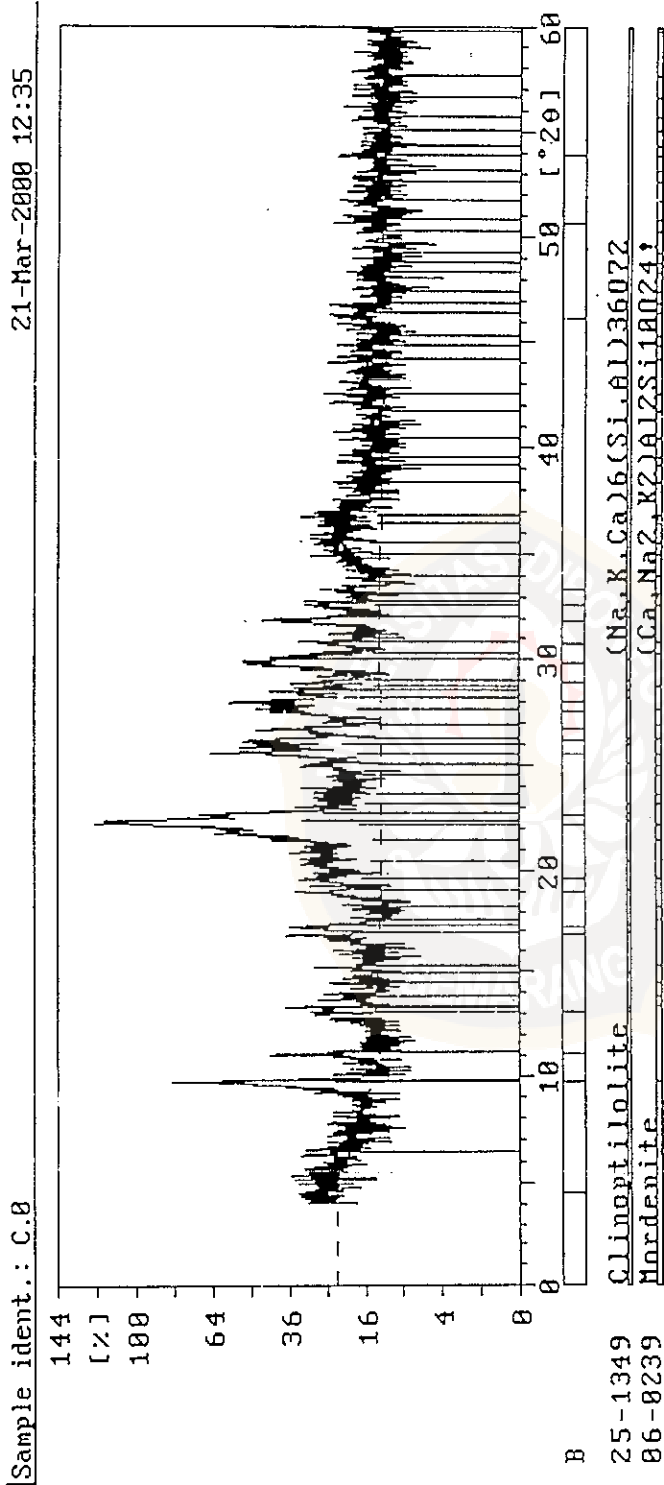
Spektrogram Zeolit Cipatujah Sesudah Perlakuan

Nr.	Pos. (1/cm)	Inten. (%T)
1	461.0	8.758
2	605.6	24.386
3	1062.7	1.432
4	1400.2	37.524
5	1637.5	34.462
6	2852.5	53.643
7	2923.9	50.666
8	3448.5	18.656
9	3737.8	47.384
10	3855.4	47.862



LAMPIRAN 4

HASIL ANALISA XRD



Difraktogram XRD Zeolit Sebelum Perlakuan

Sample identification: C.0

Data measured at: 21-Mar-2000 12:21:00

Diffractometer type: PW3710 BASED

Tube anode: Cu

Generator tension [kV]: 40

Generator current [mA]: 30

Wavelength Alpha1 [Å]: 1.54056

Wavelength Alpha2 [Å]: 1.54439

Intensity ratio (alpha2/alpha1): 0.500

Divergence slit: 1°

Receiving slit: 0.2

Monochromator used: NO

Start angle [°2θ]: 4.010

End angle [°2θ]: 59.950

Step size [°2θ]: 0.020

Maximum intensity: 139.2400

Time per step [s]: 0.100

Type of scan: CONTINUOUS

Minimum peak tip width: 0.00

Maximum peak tip width: 1.00

Peak base width: 2.00

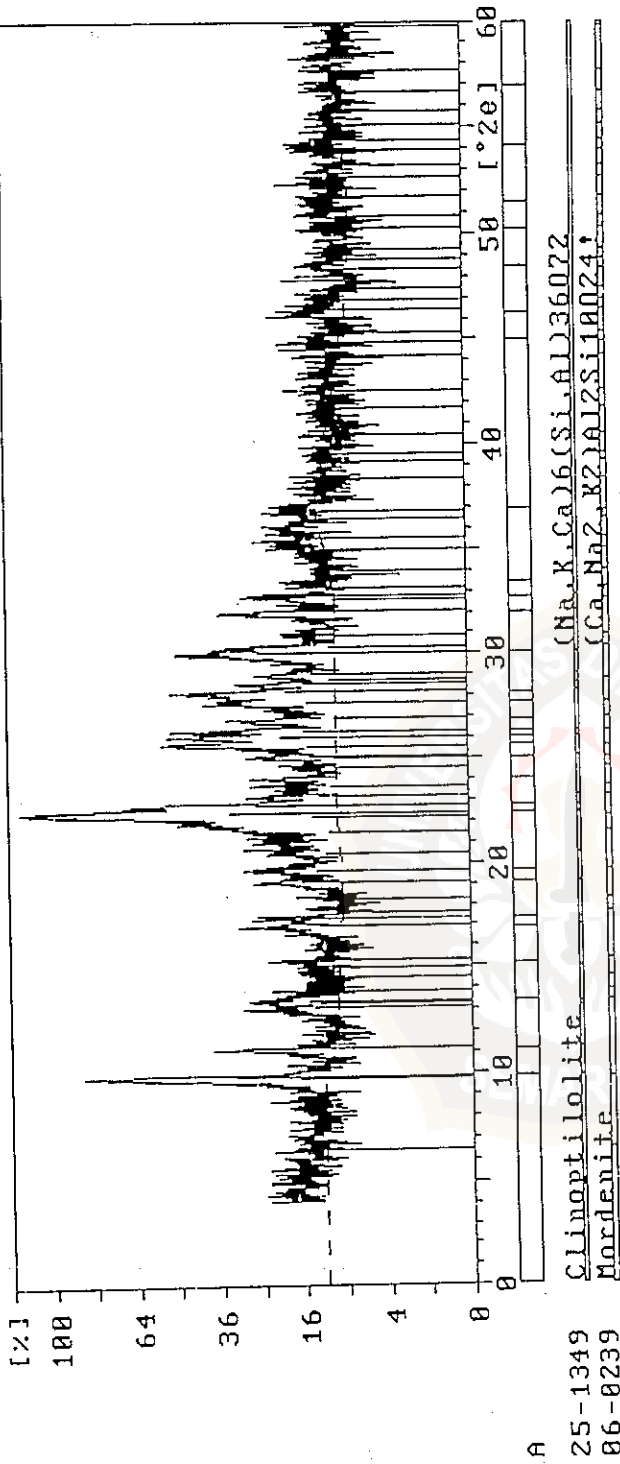
Minimum significance: 0.75

Number of peaks: 24

Angle [°2θ]	d-value α1 [Å]	d-value α2 [Å]	Peak width [°2θ]	Peak int [counts]	Back. int [counts]	Rel. int [%]	Signif.
4.465	19.7738	19.8229	0.400	8	31	5.6	0.77
9.770	9.0455	9.0680	0.060	71	20	50.7	1.33
11.080	7.9788	7.9987	0.060	42	18	30.3	0.97
13.120	6.7424	6.7592	0.640	14	19	10.4	2.09
16.825	5.2651	5.2782	0.120	29	18	20.9	2.13
17.220	5.1452	5.1580	0.200	22	18	15.9	1.23
18.930	4.6841	4.6958	0.320	20	18	14.5	1.51
19.580	4.5301	4.5413	0.240	23	18	16.5	1.83
22.210	3.9992	4.0092	0.120	139	18	100.0	0.78
22.650	3.9225	3.9323	0.120	67	18	48.3	0.89
25.575	3.4801	3.4888	0.160	61	18	43.7	1.27
26.180	3.4011	3.4095	0.160	46	18	33.2	0.85
26.725	3.3329	3.3412	0.120	38	18	27.6	1.22
27.545	3.2356	3.2436	0.240	34	18	24.2	1.28
28.035	3.1801	3.1880	0.120	44	18	31.3	1.09
28.960	3.0806	3.0883	0.120	19	18	13.9	0.79
29.880	2.9878	2.9952	0.400	49	18	35.2	3.00
30.805	2.9002	2.9074	0.200	15	18	10.9	0.91
31.905	2.8026	2.8096	0.240	34	18	24.2	3.05
32.635	2.7416	2.7484	0.320	20	18	14.5	1.33
33.375	2.6825	2.6892	0.160	13	18	9.3	1.83
46.140	1.9657	1.9706	0.640	7	17	5.2	0.76
50.590	1.8028	1.8072	0.640	3	18	1.8	0.81
53.940	1.6984	1.7027	0.480	6	17	4.5	0.79

21-Mar-2000 12:33

Sample ident.: CIPAIUJAH/4 JAM



Difraktogram XRD Zeolit Sesudah Perlakuan

Sample identification: CIPATUJAH/4 JAM
Data measured at: 21-Mar-2000 12:15:00

Diffraction type: PW3710 BASED
Tube anode: Cu
Generator tension [kV]: 40
Generator current [mA]: 20
Wavelength Alpha1 [Å]: 1.54056
Wavelength Alpha2 [Å]: 1.54439
Intensity ratio (alpha2/alpha1): 0.500
Divergence slit: 1°
Receiving slit: 0.2
Monochromator used: NO

Start angle [°2θ]: 4.010
End angle [°2θ]: 59.950
Step size [°2θ]: 0.020
Maximum intensity: 163.8400
Time per step [s]: 0.100
Type of scan: CONTINUOUS

Minimum peak tip width: 0.00
Maximum peak tip width: 1.00
Peak base width: 2.00
Minimum significance: 0.75
Number of peaks: 30

Angle [°2θ]	d-value α1 [Å]	d-value α2 [Å]	Peak width [°2θ]	Peak int [counts]	Back. int [counts]	Rel. int [%]	Signif.
9.850	8.9722	8.9945	0.120	121	20	73.9	2.62
11.140	7.9360	7.9557	0.160	38	18	23.5	1.66
13.390	6.6071	6.6235	0.240	22	17	13.5	0.86
15.120	5.8548	5.8693	0.640	7	16	4.1	0.78
16.880	5.2481	5.2611	0.240	24	16	14.7	1.08
17.335	5.1114	5.1241	0.240	17	15	10.3	1.96
19.045	4.6561	4.6677	0.200	23	15	14.1	1.15
19.625	4.5198	4.5310	0.200	24	15	14.7	0.88
22.350	3.9745	3.9844	0.320	164	16	100.0	7.43
22.735	3.9080	3.9178	0.120	86	16	52.8	2.45
24.040	3.6988	3.7080	0.160	22	16	13.5	0.76
25.020	3.5561	3.5649	0.160	24	16	14.7	0.79
25.685	3.4655	3.4741	0.200	66	16	40.0	2.34
26.035	3.4197	3.4282	0.120	58	16	35.3	1.17
26.330	3.3820	3.3904	0.060	67	16	41.0	0.76
26.850	3.3177	3.3260	0.120	34	16	20.5	0.79
27.660	3.2224	3.2304	0.240	40	16	24.2	0.87
28.140	3.1685	3.1764	0.160	58	16	35.3	1.29
30.000	2.9761	2.9835	0.200	53	16	32.5	0.94
31.925	2.8009	2.8079	0.240	37	16	22.7	2.79
32.720	2.7347	2.7415	0.240	20	16	12.4	1.31
33.445	2.6770	2.6837	0.240	8	17	4.8	0.93
36.885	2.4349	2.4409	0.480	8	21	4.8	1.00
44.965	2.0143	2.0193	0.320	6	14	3.5	0.84
46.235	1.9619	1.9668	0.640	10	13	6.2	0.92
48.455	1.8771	1.8817	0.480	8	12	4.8	1.36
50.165	1.8170	1.8215	0.400	5	12	3.0	0.93
51.480	1.7737	1.7781	0.480	5	12	3.2	0.83
54.110	1.6935	1.6977	0.480	6	13	3.8	0.83
56.890	1.6172	1.6212	0.480	3	13	1.8	1.00

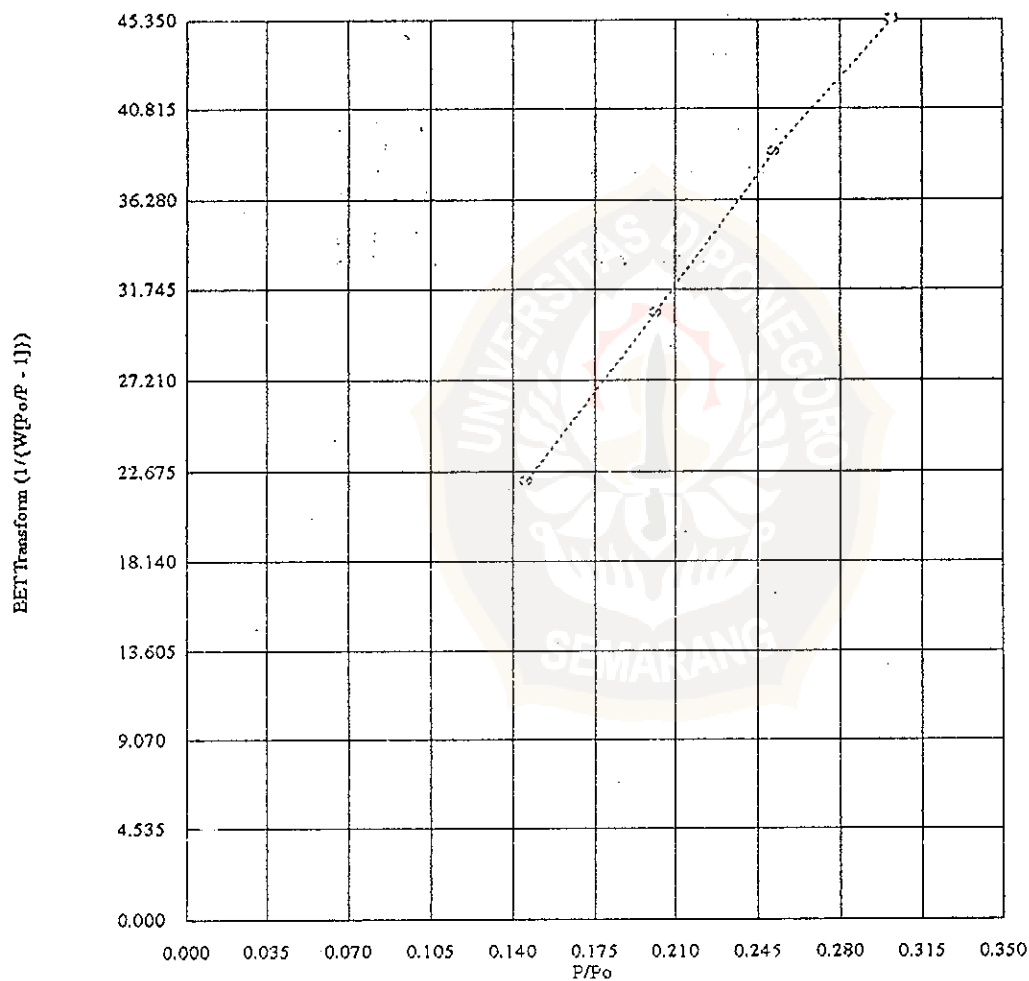
LAMPIRAN 5

HASIL ANALISA LUAS PERMUKAAN ZEOLIT CIPATUJAH

Quantachrome Corporation
NOVA Data Analysis Package Ver. 2.00
File Name = sri-c4.dat

User ID	= Sri P	User Setup	= 1
Sample ID	= Co 4	Sample Cell Number	= 11
Sample Weight	= 0.3344 g	Sample Volume	= 0.3131 cc
Sample Density	= 1.0680 g/cc		
Po Type	= User	Po	= 750.93 mm Hg
Adsorbate	= N2	Bath Temperature	= 77.40 deg K
Adsorption Tolerance	= 0.0750 mm Hg	Desorption Tolerance	= 0.1000 mm Hg
Adsorption Equil Time	= 60 sec	Desorption Equil Time	= 60 sec
Adsorption Dwell Time	= 180 sec	Desorption Dwell Time	= 180 sec
Analysis Start Time	= Fri Jan 04 10:05:30 1980	Analysis End Time	= Fri Jan 04 10:26:32 1980

Multi BET (Adsorption)

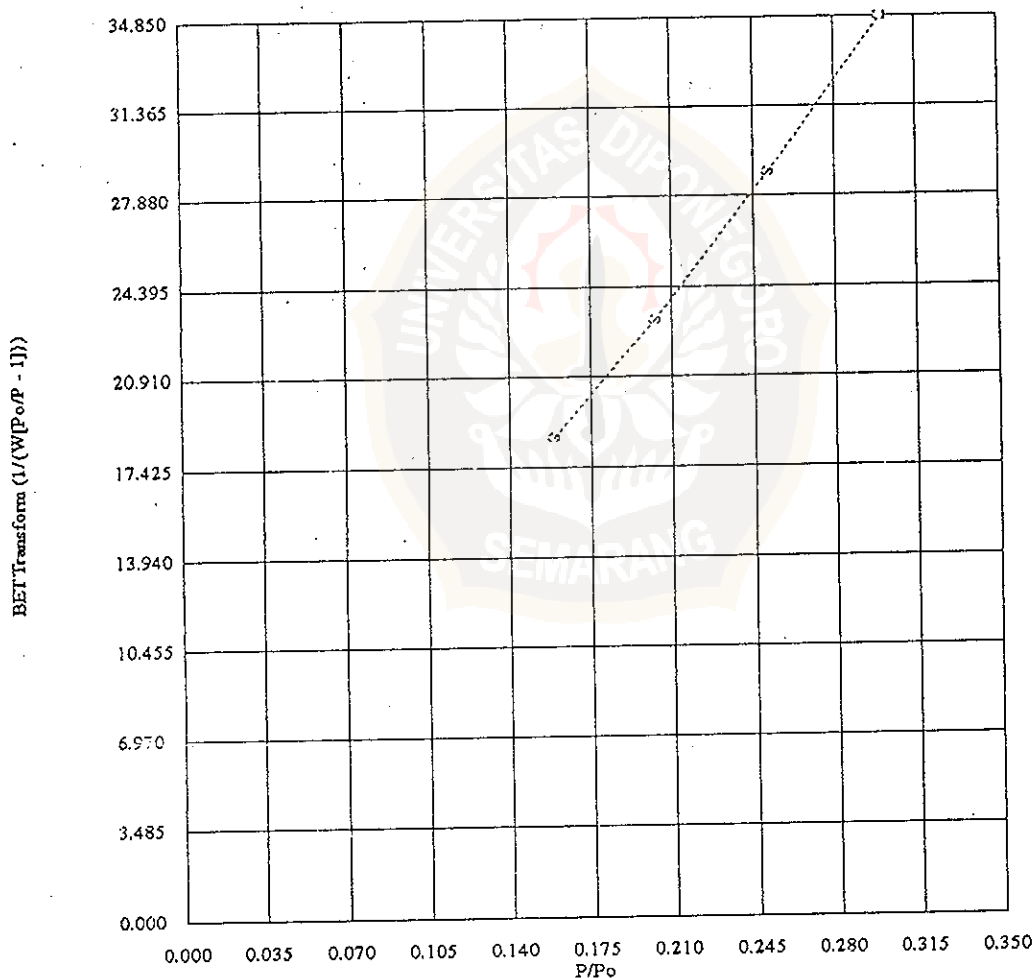


Sebelum Perlakuan

Quantachrome Corporation
NOVA Data Analysis Package Ver. 2.00
File Name = sri-c0.dat

User ID	- Sri P	User Setup	- 1
Sample ID	- Co	Sample Cell Number	- 11
Sample Weight	- 0.3300 g	Sample Volume	- 0.4412 cc
Sample Density	- 0.7478 g/cc		
Po Type	- User	Po	- 751.01 mm Hg
Adsorbate	- N2	Bath Temperature	- 77.40 deg K
Adsorption Tolerance	- 0.0750 mm Hg	Desorption Tolerance	- 0.1000 mm Hg
Adsorption Equil Time	- 60 sec	Desorption Equil Time	- 60 sec
Adsorption Dwell Time	- 180 sec	Desorption Dwell Time	- 180 sec
Analysis Start Time	- Fri Jan 04 09:44:54 1980	Analysis End Time	- Fri Jan 04 10:07:38 1980

Multi BET (Adsorption)



Sesudah Perlakuan

Quantachrome Corporation
 NOVA Data Analysis Package Ver. 2.00
 File Name = sri-c0.dat

User ID = Sri P User Setup = 1
 Sample ID = Co Sample Cell Number = 11
 Sample Weight = 0.3300 g Sample Volume = 0.4412 cc
 Sample Density = 0.7478 g/cc
 Po Type = User Po = 751.01 mm Hg
 Adsorbate = N2 Bath Temperature = 77.40 deg K
 Adsorption Tolerance = 0.0750 mm. Hg Desorption Tolerance = 0.1000 mm Hg
 Adsorption Equil Time = 60 sec Desorption Equil Time = 60 sec
 Adsorption Dwell Time = 180 sec Desorption Dwell Time = 180 sec
 Analysis Start Time = Fri Jan 04 09:44:54 1980 Analysis End Time = Fri Jan 04 10:07:38 1980

Multi BET (Adsorption)

P/Po	BET Transform (1/(W[Po/P - 1]))
0.159094	18.569652
0.202443	23.102181
0.251055	28.773629
0.300367	34.807122
Slope	= 115.228676
Intercept	= 0.013392
Correlation Coefficient	= 0.999431
PET C	= 8605.566584
Surface Area	= 9.971773 sqm
Specific Surface Area	= 30.219143 sqm/g

LAMPIRAN 6

HASIL ANALISA AAS

PEMERIKSAAN PARAMETER FISIKA DAN KIMIA

Jenis sampel : Padatan
Asal sampel : -
Dikirim oleh : Sri Suparniati, Mhs.MIPA UNDIP Semarang
Dambil oleh : Sri Suparniati, Mhs.MIPA UNDIP Semarang
Tgl.Pengambilan/penerimaan : - /20-12-1999
No.lab. : 6855 F s.d. 6860 F
6855 F : Contoh bubuk zeolit Kode B4
6856 F : Contoh bubuk zeolit Kode B0
6857 F : Contoh bubuk zeolit Kode C4
6858 F : Contoh bubuk zeolit Kode PO
6859 F : Contoh bubuk zeolit Kode P4
6860 F : Contoh bubuk zeolit Kode CO

No.	Parameter	Satuan	Hasil analisa					
			6855 F	6856 F	6857 F	6858 F	6859 F	6860 F
1.	Al	mg/kg	12630	6677	4900	17170	13860	21600
2.	Si	mg/kg	169.399	165.921	169.309	167,080	176,126	166.616

Yogyakarta, 31 Desember 1999

Mengetahui :
Kepala Balai Teknik Kesehatan
Lingkungan Yogyakarta

Ir.JB.BUDI HARSANTO
NIP.140098823

Koordinator Laboratorium Kimia Fisika
Padat dan Cair

Ir.SIGIT HERNOWO
NIP.140129859

Kepada Yth.
Pimpinan PPTM
di Bandung

Dengan hormat,

Yang bertanda tangan dibawah ini, kami selaku dosen pembimbing mahasiswa penelitian Tugas Akhir, menerangkan bahwa :

Nama : Sri Suparniati

Fak/Jur : MIPA/Kimia

kami mohon untuk diperkenankan mengadakan survai lapangan di perusahaan Bapak, untuk keperluan penelitian Tugas Akhir mahasiswa tersebut.

Atas perhatiannya kami ucapkan terima kasih

Semarang, 22 Mei 1999

Dosen Pembimbing



Dra. Arnelli, MS

NIP. 131 835 916