LAMPIRAN

Lampiran A. Perhitungan Preparasi Bahan

A.1 Pembuatan Larutan HF 1 %

Diketahui: % w/w = 40%

$Vo = \frac{N.V}{No}$ dengan V_0= Volume HF 40% yang dibutuhkan

N_0= % w/w HF awal

N = % w/w HF yang digunakan

V = Volume larutan HF yang diinginkan

$$V_0 = \frac{1\% \times 1000mL}{40\%} = 25mL$$

A.2 Pembuatan Standar BSA

Diketahui: Massa BSA= 30 mg

Volume Akuades= 100 mL

$$M_0 = \frac{MassaBSA}{VolumeAkuades}$$

$$M_0 = \frac{30mg}{100mL} = 0.3mg/mL$$

$V_0 = \frac{M \times V}{Mo}$ dengan V_0=Volume larutan BSA yang dibutuhkan

M_0=Konsentrasi larutan BSA awal

M = Konsentrasi larutan BSA yang diinginkan

V= Volume larutan BSA yang diinginkan

1. Pembuatan larutan BSA 0,24 mg/mL

$$V_0 = \frac{0{,}24\,^{mg}/_{mL} \times 100mL}{0{,}3\,^{mg}/_{mL}} = 80mL$$

2. Pembuatan larutan BSA 0,18 mg/mL

$$V_0 = \frac{0{,}18\,^{mg}/_{mL} \times 100mL}{0{,}3\,^{mg}/_{mL}} = 60mL$$

3. Pembuatan larutan BSA 0,12 mg/mL

$$V_0 = \frac{0{,}12\,^{mg}/_{mL} \times 100mL}{0{,}3\,^{mg}/_{mL}} = 40mL$$

4. Pembuatan larutan BSA 0,06 mg/mL

$$V_0 = \frac{0{,}06\,^{mg}/_{ml} \times 100mL}{0{,}3\,^{mg}/_{mL}} = 20mL$$

Lampiran B. Perhitungan Hasil

B.1 Perhitungan Kadar Protein

Tabel 1 Penentuan panjang gelombang maksimum BSA

Panjang Gelombang	Absorbansi
630	0,053
640	0,054
650	0,055
660	0,056
670	0,057
680	0,058
690	0,059
700	0,06
710	0,06
720	0,061
730	0,061
740	0,061
750	0,062
760	0,061
770	0,06

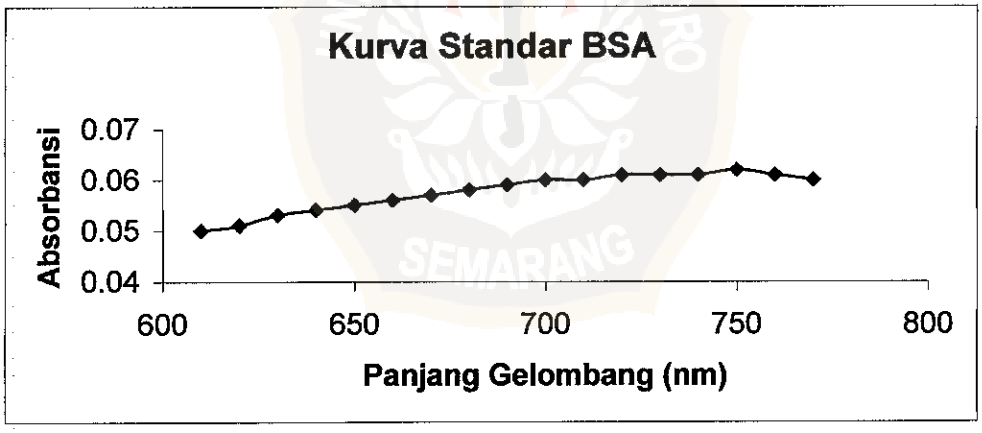
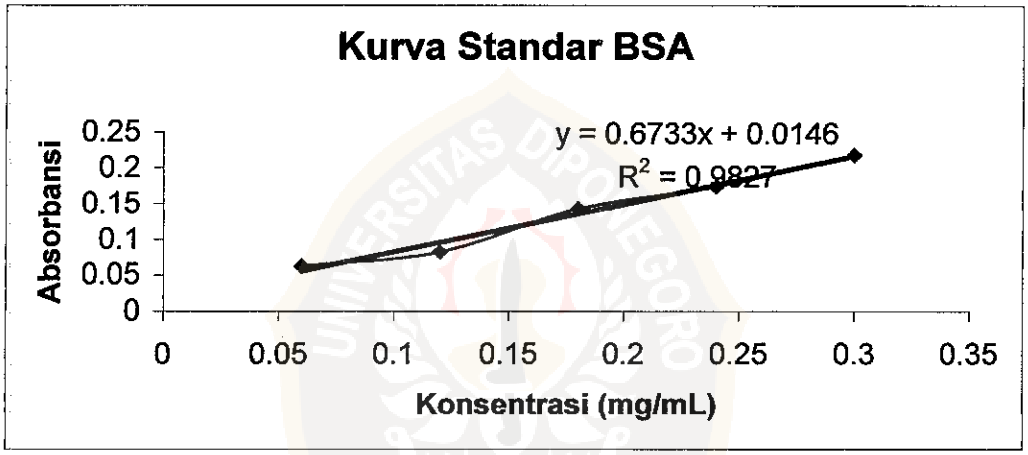


Table 2 Harga absorbansi dengan variasi konsentrasi BSA

Konsentrasi (mg/mL)	Absorbansi A1	Absorbansi A2	Absorbansi A3	Absorbansi Rata-rata
0,06	0,062	0,064	0,063	0,063
0,12	0,082	0,08	0,084	0,082
0,18	0,143	0,14	0,0143	0,142
0,24	0,174	0,177	0,0177	0,176
0,3	0,218	0,219	0,218	0,218



Hasil penentuan rumus standar BSA pada panjang gelombang maksimum 750 nm

Secara grafik dengan sumbu Y= Absorbansi

X= Konsentrasi BSA

Diperoleh rumus kurva standar protein sebagai berikut:

Y= 0,6733X + 0.0146

$$\text{Kadar protein (X)} = \frac{Y - 0{,}0146}{0{,}6733} \times f_p$$

dengan X= konsentrasi protein enzim (mg/mL)

Y= Absorbansi

F_p= Faktor pengenceran

0,6733= Slope

0,0146= Intersep

Tabel 3 Harga absorbansi sesudah amobilisasi

Sampel	Absorbansi (1)	Absorbansi (2)	Absorbansi (3)	Absorbansi Rata-rata
ZA	0,181	0,181	0,182	0,1813
Z-C-B1	0,038	0,039	0,038	0,0383
Z-C-B2	0,035	0,036	0,036	0,0366
Z-C-B3	0,094	0,094	0,094	0,094

I. Kadar protein sebelum amobilisasi

Diketahui: A1=0,260 A2= 0,260 A3= 0,261

A rata-rata= 0,260

$$X=\frac{0,260-0,0146}{0,6733}\times 4 = 0,1457 \text{ mg/mL}$$

II. Kadar protein sesudah amobilisasi

1. ZA

$$X=\frac{0,1813-0,0146}{0,6733}\times 3 = 0,7427$$

2. Z-CB1

$$X=\frac{0,0383-0,0146}{0,6733}\times 3 = 0,1055$$

3. Z-CB2

$$X=\frac{0,0356-0,0146}{0,6733}\times 3 = 0,3537$$

4. Z-CB3

$$X=\frac{0,094-0,0146}{0,6733}\times 3 = 0,0935$$

B.2 Perhitungan prosentase pengurangan enzim

$$\text{Pr}osentase\,(\%) = \frac{Sebelum amobilisasi - Sesudah amobilisasi}{Sebelum amobilisasi} x100\%$$

1. ZA

$$\%=\frac{1,457-0,7567}{1,457}x100 = 48,06$$

2. ZCB-1

$$\%=\frac{1,457-0,1055}{1,457}x100 = 92,87$$

3. ZCB-2

$$\%=\frac{1,457-0,3537}{1,457}x100 = 75,84$$

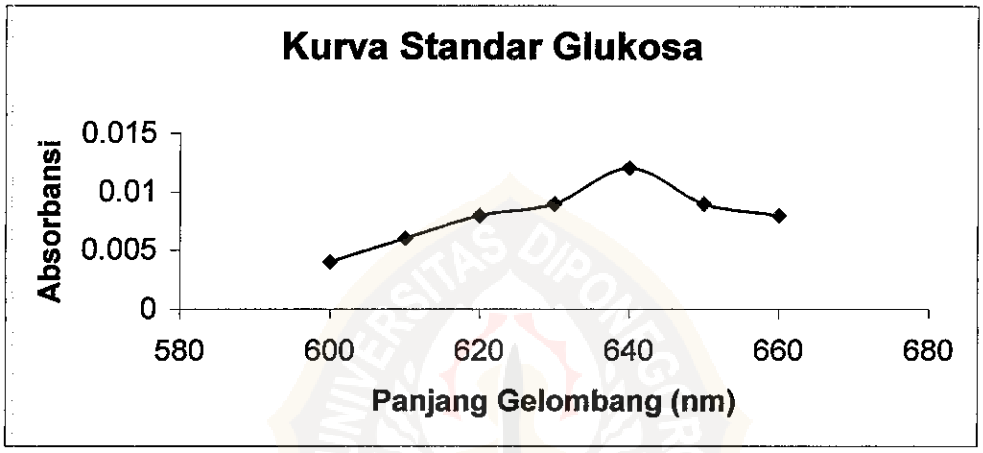
4. ZCB-3

$$\%=\frac{1,457-0,0935}{1,457}x100 = 93,59$$

B.3 Perhitungan kadar glukosa

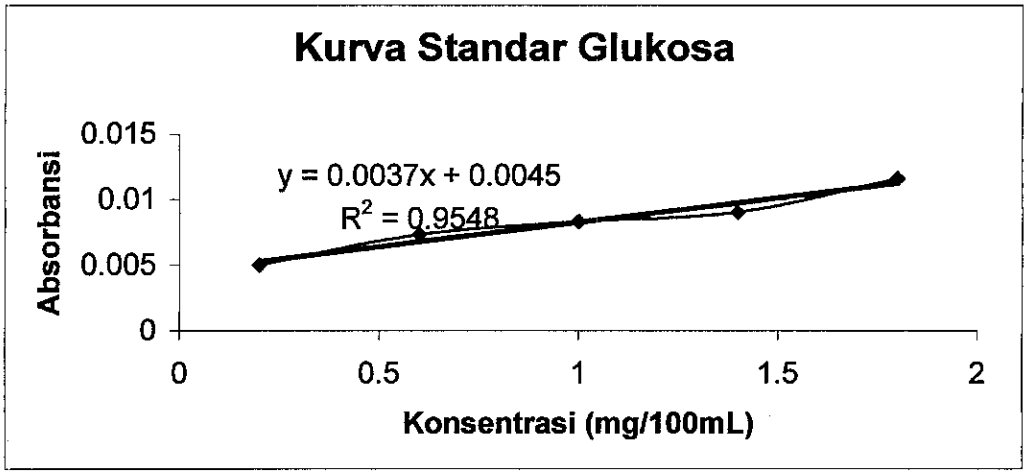
Tabel 4: Penentuan panjang gelombang maksimum

Panjang Gelombang (nm)	Absorbansi
600	0,004
610	0,006
620	0,008
630	0,009
640	0,012
650	0,009
660	0,008



Tabel 5 Harga absorbansi pada variasi konsentrasi glukosa

Konsentrasi (mg/100mL)	A1	A2	A3	A rata-rata
0,2	0,005	0,005	0,005	0,005
0,6	0,007	0,007	0,008	0,0073
1,0	0,008	0,008	0,009	0,0083
1,4	0,01	0,009	0,009	0,0093
1,8	0,012	0,011	0,012	0,0116



Hasil penentuan rumus glukosa pada panjang gelombang maksimum 640 nm

Secara grafik dengan sumbu Y= Absorbansi

X= Konsentrasi glukosa

Diperoleh rumus kurva standar glukosa sebagai berikut

Y= 0.0372 X+ 0.0045

$$\text{Kadar Glukosa (X)} = \frac{Y - 0{,}0045}{0{,}00372} \times \text{fp}$$

dengan X= Konsentrasi glukosa (mg/100mL)

Y= Absorbansi Fp= Faktor pengenceran

0,0372= Slope 0,0045= Intersep

Tabel 6 Harga absorbansi pada Z-CB3

Perlakuan	Absorbansi	Tabung 1	Tabung 2	Tabung 3
Pemakaian 1	1	0,009	0,013	0,008
	2	0,010	0,012	0,008
	3	0,009	0,010	0,006
	Rata-rata	0,0093	0,0116	0,0073
Pemakaian 2	1	0,010	0,011	0,009
	2	0,008	0,010	0,009
	3	0,007	0,010	0,008
	Rata-rata	0,0083	0,0103	0,0083

Tabel 7 Harga absorbansi pada Z-CB2

Perlakuan	Absorbansi	Tabung 1	Tabung 2	Tabung 3
Pemakaian 1	1	0,007	0,009	0,009
	2	0,005	0,009	0,007
	3	0,007	0,008	0,008
	Rata-rata	0,0063	0,0086	0,008
Pemakaian 2	1	0,007	0,008	0,005
	2	0,007	0,008	0,007
	3	0,008	0,008	0,007
	Rata-rata	0,0073	0,008	0,0063

Tabel 8 Harga absorbansi pada Z-CB1

Perlakuan	Absorbansi	Tabung 1	Tabung 2	Tabung 3
Pemakaian 1	1	0,007	0,006	0,011
	2	0,010	0,005	0,012
	3	0,008	0,005	0,011
	Rata-rata	0,0083	0,0053	0,0113
Pemakaian 2	1	0,009	0,007	0,007
	2	0,009	0,008	0,006
	3	0,008	0,008	0,006
	Rata-rata	0,0086	0,0076	0,0063

Tabel 9 Harga absorbansi pada ZA

Perlakuan	Absorbansi 1	Absorbansi 2	Absorbansi 3	Rata-rata
Pemakaian 1	0,006	0,006	0,006	0,006
Pemakaian 2	0,005	0,005	0,006	0,0046

Tabel 10 Harga absorbansi pada enzim

Perlakuan	Absorbansi 1	Absorbansi 2	Absorbansi 3	Rata-rata
Pemakaian 1	0,026	0,026	0,027	0,0263

$$\text{Kadar Glukosa (X)} = \frac{Y - 0{,}0045}{0{,}00372} \times 1$$

Tabel 11 Kadar glukosa hasil hidrolisis amilum oleh α-amilase pada Z-CB3

Perlakuan	Kadar Glukosa (mg/100mL)	Tabung 1	Tabung 2	Tabung 3
Pemakaian 1	1	1,2096	2,2849	0,9408
	2	1,4784	2,0161	0,9408
	3	1,2096	1,4784	0,4032
	Rata-rata	1,2992	1,9264	0,7616
Pemakaian 2	1	1,4784	1,7473	1,2096
	2	0,9408	1,4784	1,2096
	3	0,6720	1,4784	0,9408
	Rata-rata	1,0304	1,5680	1,1200

Tabel 12 Kadar glukosa hasil hidrolisis amilum oleh α-amilase pada Z-CB2

Perlakuan	Kadar Glukosa (mg/100mL)	Tabung 1	Tabung 2	Tabung 3
Pemakaian 1	1	0,6720	1,2096	1,2096
	2	0,1344	1,2096	0,6720
	3	0,6720	0,9408	0,9408
	Rata-rata	0,4928	1,1200	0,9408
Pemakaian 2	1	0,6720	0,9408	0,1344
	2	0,6720	0,9408	0,4032
	3	0,9408	0,9408	0,4032
	Rata-rata	0,7616	0,9408	0,3136

Tabel 13 Kadar glukosa hasil hidrolisis amilum oleh α-amilase pada Z-CB1

Perlakuan	Kadar Glukosa (mg/100mL)	Tabung 1	Tabung 2	Tabung 3
Pemakaian 1	1	0,6720	0,4032	1,7473
	2	1,4784	0,1344	2,0161
	3	0,9408	0,1344	1,7473
	Rata-rata	1,0304	0,2240	1,8369
Pemakaian 2	1	1,2096	0,6720	0,6720
	2	1,2096	0,9408	0,4032
	3	0,9408	0,9408	0,4032
	Rata-rata	1,1200	0,8512	0,4928

Tabel 14 Kadar glukosa hasil hidrolisis amilum oleh α-amilase pada ZA

Perlakuan	Kadar Glukosa 1	Kadar Glukosa 2	Kadar Glukosa 3	Rata-rata
Pemakaian 1	0,4032	0,4032	0,4032	0,4032
Pemakaian 2	0,1344	0,1344	0,4032	0,2240

Tabel 15 Kadar glukosa hasil hidrolisis amilum oleh α-amilase

Perlakuan	Kadar Glukosa 1	Kadar Glukosa 2	Kadar Glukosa 3	Rata-rata
Pemakaian 1	5,7795	5,7795	6,0483	5,8591

Lampiran C. Hasil Analisis AAS

AS GADJAH MADA
ATORIUM KIMIA ANALITIK
KIMIA
MATEMATIKA DAN ILMU PENGETAHUAN ALAM

Sekip Utara PO Box BLS 21,
Yogyakarta 55281 Telp. (0274) 902740, 545188 pes. 116
Faks. 0274-545188

Data AAS untuk Penentuan Kadar Si dan Al Zeolit

1. Kadar Si dalam Zeolit

Data Absorbansi Standar Si

ppm	Absorbansi
0	0
40	0.056
60	0.077
80	0.100
100	0.122

Diperoleh persamaan:

$y = 0.0012x + 0.0031$

y = absorbansi sampel
x = ppm perhitungan

Data Absorbansi Sampel

Sampel	Absorbansi	Faktor Pengenceran
Zeolit Alam	0.063	20
Zeolit Destruksi	0.113	10
Zeolit Modifikasi	0.087	10

Rumus yang digunakan untuk menghitung kadar Si:

$$ppm = \frac{ppm\ perhitungan \times volume\ induk :: pengenceran}{gram\ penimbangan}$$

Lampiran C (lanjutan)

UNIVERSITAS GADJAH MADA
LABORATORIUM KIMIA ANALITIK
JURUSAN KIMIA
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM

Sekip Utara PO Box BLS 2
Yogyakarta 55281 Telp. (0274) 902740, 545188 pes. 11
Faks. 0274-545111

2. Kadar Al dalam Zeolit

Data Absorbansi Standar Al

ppm	Absorbansi
20	0.048
40	0.086
60	0.125
80	0.173
100	0.190

Diperoleh Persamaan:

$y = 0.0019\,x + 0.0062$

y = absorbansi sample

x = konsentrasi

Data absorbansi sample

Sampel	Absorbansi	Faktor Pengenceran
Zeolit Alam	0.094	10
Zeolit Destruksi	0.059	2
Zeolit Modifikasi	0.122	2

Rumus yang digunakan untuk menghitung kadar Si:

$$ppm = \frac{ppm\ perhitungan \times Volume\ induk \times pengenceran}{gram\ penimbangan}$$

Lampiran C (Lanjutan)

ERSITAS GADJAH MADA
BORATORIUM KIMIA ANALITIK
SAN KIMIA
LTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM

Sekip Utara PO Box BLS 21,
Yogyakarta 55281 Telp. (0274) 902740, 545188 pes. 116
Faks. 0274-545188

Dari hasil perhitungan seperti dalam lampiran, rasio Si/Al dari sampel adalah sebagai berikut:

Sampel	Kadar Si (%)	Kadar Al (%)	Rasio Si/Al
Zeolit Alam	12.479	5.776	2.075
Zeolit Destruksi	7.784	0.472	15.84
Zeolit Modifikasi	8.739	1.523	5.511

Yogyakarta, 10 Oktober 2004

Laboran Kimia Analitik FMIPA-UGM

Pribadi Prasetyo
NIP 130811390

Lampiran D. Hasil Analisis XRD

Data XRD Zeolit Alam

Strongest 3 peaks							
no.	peak no.	2Theta (deg)	d (A)	I/I1	FWHM (deg)	Intensity (Counts)	Integrated Int (Counts)
1	30	25.5794	3.47964	100	0.21870	1626	21355
2	22	22.1739	4.00575	62	0.28300	1009	16306
3	35	27.6577	3.22271	55	0.45040	893	19861

Peak Data List						
peak no.	2Theta (deg)	d (A)	I/I1	FWHM (deg)	Intensity (Counts)	Integrated Int (Counts)
1	5.8800	15.01847	3	0.62060	54	1569
2	6.2600	14.10764	5	0.23000	86	810
3	6.4400	13.71372	8	0.22900	132	1454
4	8.5600	10.32150	3	0.18940	55	454
5	8.7300	10.12088	6	0.30000	102	1344
6	9.3600	9.44104	4	0.18000	71	1107
7	9.6923	9.11808	31	0.25050	503	6922
8	12.0818	7.31957	6	0.22090	102	1683
9	13.0400	6.78379	6	0.25200	105	1971
10	13.3928	6.60587	31	0.25300	500	5970
11	13.7600	6.43040	11	0.27820	174	3064
12	14.5261	6.09294	7	0.23620	115	1858
13	15.2195	5.81687	13	0.22900	214	3065
14	17.3200	5.11587	3	0.23560	55	947
15	17.6141	5.03111	8	0.27830	133	2601
16	19.2800	4.59999	7	0.17100	116	1859
17	19.5625	4.53419	36	0.27310	581	7431
18	19.9800	4.44038	16	0.28220	259	5214
19	20.8082	4.26547	6	0.22080	104	1348
20	21.4200	4.14501	6	0.38000	94	1725
21	21.7600	4.08100	12	0.31200	192	4038
22	22.1739	4.00575	62	0.28300	1009	16306
23	22.6800	3.91750	6	0.00000	97	0
24	23.0667	3.85269	30	0.23530	481	6939
25	23.5979	3.76715	17	0.24290	280	3866
26	23.9400	3.71409	4	0.14760	60	681
27	24.4600	3.63629	4	0.25720	62	893
28	24.9400	3.56739	12	0.45200	200	3938
29	25.1200	3.54223	11	0.00000	184	0
30	25.5794	3.47964	100	0.21870	1626	21355
31	26.1931	3.39949	45	0.27920	730	11079
32	26.5400	3.35584	15	0.21680	236	3290
33	27.0600	3.29252	5	0.24000	82	1134
34	27.3000	3.26412	11	0.17480	177	1707
35	27.6577	3.22271	55	0.45040	893	19861
36	28.2000	3.16196	6	0.00000	95	0
37	28.3000	3.15101	4	0.00000	70	0
38	28.5600	3.12291	3	0.00000	54	0
39	28.6800	3.11012	4	0.00000	61	0
40	28.8200	3.09533	4	0.22000	57	773
41	29.7600	2.99964	9	0.18660	74	1428
42	29.9600	2.98003	5	0.00000	82	0
43	30.3400	2.94303	6	0.21340	100	2240
44	30.8367	2.89734	25	0.22450	412	5627

Lampiran D (Lanjutan)

peak no.	2Theta (deg)	d (A)	I/I1	FWHM (deg)	Intensity (Counts)	Integrated Int (Counts)
45	31.9387	2.79984	5	0.26750	80	1206
46	32.7000	2.73637	4	0.33000	70	1186
47	33.1327	2.70162	6	0.25890	99	1478
48	34.5400	2.59470	3	0.15120	54	931
49	34.7200	2.58165	5	0.00000	89	0
50	34.9600	2.56448	8	0.33780	127	2152
51	35.3200	2.53916	5	0.17000	87	934
52	35.5858	2.52080	17	0.24990	269	3697
53	36.2600	2.47546	4	0.20000	64	805
54	36.4400	2.46365	7	0.28440	110	1598
55	36.7600	2.44293	4	0.00000	66	0
56	36.9400	2.43144	4	0.16660	67	962
57	40.3700	2.23241	4	0.28000	62	1548
58	41.7125	2.16361	3	0.39500	56	1960
59	44.0000	2.05629	4	0.16000	64	515
60	44.1800	2.04833	6	0.20800	102	1010
61	44.4400	2.03695	3	0.16000	49	435
62	44.8923	2.01747	5	0.35260	81	2114
63	46.4280	1.95425	5	0.34400	87	2075
64	48.1200	1.88941	3	0.12920	53	642
65	48.3519	1.88089	12	0.19880	187	2295
66	50.1000	1.81928	4	0.21860	71	942
67	50.3000	1.81252	6	0.18580	96	933
68	50.8127	1.79542	8	0.31200	129	2524
69	53.1762	1.72106	3	0.18360	52	683
70	53.9600	1.69789	3	0.45820	55	1233
71	54.2000	1.69094	4	0.13540	58	444
72	55.0273	1.66746	3	0.40130	54	1750
73	59.7400	1.54668	4	0.33780	62	1431

Lampiran D (Lanjutan)

*** Basic Data Process ***

Group Name : Data 2004
Data Name : Ruseno
File Name : Ruseno.PKR
Sample Name : Zeolit
Comment : Zeolit .

Strongest 3 peaks

no.	peak no.	2Theta (deg)	d (A)	I/I1	FWHM (deg)	Intensity (Counts)	Integrated Int (Counts)
1	46	29.3800	3.03759	100	0.44000	81	2104
2	44	28.3800	3.14231	48	0.00000	39	0
3	47	29.9000	2.98594	48	0.52000	39	1143

Peak Data List

	peak no.	2Theta (deg)	d (A)	I/I1	FWHM (deg)	Intensity (Counts)	Integrated Int (Counts)
	1	3.1600	27.93705	11	0.16000	9	74
	2	4.7200	18.70653	11	0.20000	9	105
	3	5.2926	16.68391	7	0.20130	6	56
	4	5.8700	15.04404	14	0.09200	11	122
	5	6.7550	13.07491	2	0.03000	2	3
	6	7.1750	12.31046	2	0.03000	2	4
	7	7.9050	11.17520	2	0.07000	2	8
	8	8.1750	10.80670	5	0.03000	4	7
	9	9.1066	9.70317	14	0.41330	11	230
	10	9.6900	9.12024	9	0.14000	7	86
	11	10.2790	8.59893	6	0.01800	5	12
	12	11.2573	7.85375	9	0.05070	7	37
	13	11.8800	7.44345	21	0.36000	17	298
	14	12.3250	7.17568	17	0.33000	14	235
	15	12.7150	6.95645	9	0.09000	7	57
	16	13.0716	6.76747	11	0.12330	9	105
	17	13.4800	6.56334	6	0.02660	5	23
	18	13.9100	6.36140	17	0.10000	14	151
	19	14.6125	6.05711	27	0.29500	22	350
	20	15.1546	5.84164	25	0.35930	20	414
	21	15.8900	5.57290	15	0.06000	12	88
	22	16.4093	5.39769	6	0.03470	5	19
	23	16.8775	5.24899	22	0.11500	18	200
	24	17.3400	5.11001	19	0.08000	15	144
	25	17.8375	4.96860	15	0.07500	12	93
	26	18.2400	4.85985	22	0.12000	18	173
	27	18.5600	4.77678	22	0.36000	18	362
	28	19.2891	4.59784	16	0.06970	13	61
	29	19.7900	4.48258	19	0.12000	15	113
	30	20.3500	4.36047	7	0.06000	6	43
	31	20.8740	4.25218	17	0.10800	14	114
	32	21.3283	4.16262	19	0.24330	15	227
	33	21.7400	4.08471	9	0.18000	7	102
→	34	22.7550	3.90475	19	0.15000	15	278
	35	23.3845	3.80104	25	0.23900	20	292
	36	24.2700	3.66433	23	0.14000	19	212
	37	24.8166	3.58484	27	0.27330	22	381
→	38	25.5960	3.47743	23	0.16800	19	227
	39	26.2587	3.39115	44	0.45750	36	730
	40	26.6600	3.34101	36	0.26000	29	312
	41	27.1200	3.28537	41	0.52000	33	757
	42	27.3800	3.25476	38	0.00000	31	0
→	43	27.9200	3.19303	37	0.00000	30	0
	44	28.3800	3.14231	48	0.00000	39	0

Lampiran D (Lanjutan)

peak no.	2Theta (deg)	d (Å)	I/I1	FWHM (deg)	Intensity (Counts)	Integrated Int (Counts)
45	28.7400	3.10376	44	0.00000	36	0
46	29.3800	3.03759	100	0.44000	81	2104
47	29.9000	2.98594	48	0.52000	39	1143
48	30.4400	2.93419	35	0.00000	28	0
49	30.7800	2.90254	46	0.38660	37	1025
50	31.2200	2.86263	31	0.00000	25	0
51	31.6200	2.82733	41	0.34000	33	874
52	32.1675	2.78044	21	0.18500	17	167
53	32.4750	2.75481	40	0.33000	32	504
54	33.2700	2.69078	20	0.14000	16	156
55	33.6400	2.66203	19	0.12000	15	203
56	34.0960	2.62746	21	0.11200	17	161
57	34.4833	2.59883	5	0.03330	4	15
58	34.8390	2.57311	6	0.01800	5	11
59	35.3890	2.53437	21	0.16200	17	139
60	35.9200	2.49811	16	0.20000	13	128
61	36.6078	2.45274	11	0.07570	9	47
62	37.1533	2.41797	15	0.13330	12	112
63	37.8833	2.37304	33	0.35330	27	529
64	38.2200	2.35290	20	0.00000	16	0
65	38.9200	2.31218	14	0.00000	11	0
66	39.3400	2.28846	12	0.00000	10	0
67	39.8917	2.25807	19	0.17000	15	182
68	40.4200	2.22977	6	0.04000	5	27
69	40.7400	2.21299	16	0.20000	13	172
70	41.6700	2.16572	23	0.18000	19	233
71	42.1381	2.14274	27	0.15040	22	264
72	42.5800	2.12152	23	0.08000	19	189
73	43.0800	2.09805	25	0.17340	20	337
74	43.4870	2.07935	16	0.40600	13	260
75	43.8450	2.06320	14	0.13000	11	69
76	44.0966	2.05201	11	0.12670	9	67
77	44.4880	2.03486	17	0.41600	14	306
78	45.3000	2.00026	16	0.24000	13	184
79	45.8000	1.97957	27	0.20000	22	225
80	46.3450	1.95756	14	0.11000	11	129
81	47.1357	1.92655	25	0.27140	20	283
82	47.7585	1.90287	19	0.08290	15	145
83	48.4775	1.87631	20	0.16500	16	165
84	49.0566	1.85551	5	0.03330	4	9
85	49.4105	1.84304	12	0.19240	10	100
86	49.8250	1.92868	19	0.08340	15	99
87	50.8400	1.79452	12	0.40000	10	253
88	51.1000	1.78600	12	0.00000	10	0
89	51.5075	1.77283	32	0.34500	26	496
90	52.1025	1.75397	9	0.11500	7	71
91	52.4850	1.74209	14	0.13000	11	110
92	52.9193	1.72881	15	0.33470	12	180
93	53.7500	1.70403	20	0.14000	16	118
94	54.1666	1.69191	28	0.22670	23	267
95	54.5220	1.68171	31	0.28400	25	309
96	55.1816	1.66316	25	0.25670	20	299
97	55.7100	1.64863	15	0.22000	12	194
98	56.2450	1.63421	14	0.09000	11	70
99	56.7150	1.62178	22	0.39000	18	301
100	57.0275	1.61363	16	0.17500	13	106
101	57.3575	1.60513	9	0.18500	7	88
102	58.0266	1.58821	10	0.13330	8	66
103	58.4850	1.57685	10	0.15000	8	76

Lampiran D (Lanjutan)

Group Name : standard
Data Name : Senoundip-11
File Name : Senoundip-11.PKR
Sample Name : Z-CT-BA-24
Comment : Z-CT-BA-24

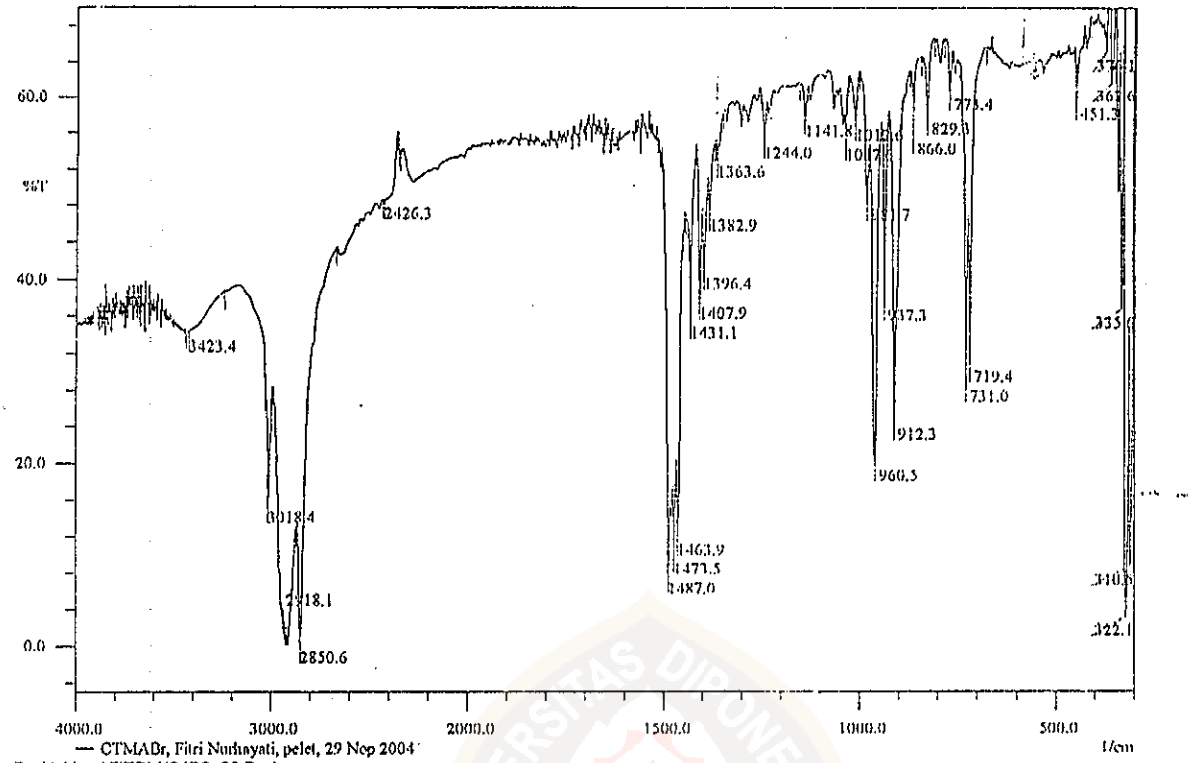
‖ Strongest 3 peaks

no.	peak no.	2Theta (deg)	d (A)	I/I1	FWHM (deg)	Intensity (Counts)	Integrated Int (Counts)
1	14	32.1250	2.78402	100	0.18020	814	7646
2	11	28.9782	3.07879	56	0.17410	454	4369
3	16	33.8589	2.64532	53	0.16060	432	3594

‖ Peak Data List

peak no.	2Theta (deg)	d (A)	I/I1	FWHM (deg)	Intensity (Counts)	Integrated Int (Counts)
1	17.1541	5.16497	10	0.16830	80	840
2	19.0293	4.66002	49	0.17780	401	3956
3	20.7900	4.26917	4	0.25000	32	689
4	22.6498	3.92265	4	0.17600	36	409
5	23.1292	3.84242	14	0.18640	114	1364
6	25.2733	3.52109	10	0.22670	85	1011
7	25.5000	3.49030	4	0.15000	32	267
8	26.1221	3.40857	8	0.18030	68	862
9	28.0407	3.17956	49	0.15800	397	3555
10	28.6400	3.11437	4	0.10660	32	353
11	28.9782	3.07879	56	0.17410	454	4369
12	30.4907	2.92942	10	0.20020	84	938
13	31.8200	2.81001	17	0.16340	137	1529
14	32.1250	2.78402	100	0.18020	814	7646
15	32.3915	2.76173	4	0.09300	35	199
16	33.8589	2.64532	53	0.16060	432	3594
17	34.0400	2.63166	10	0.08900	78	681
18	34.7509	2.57943	6	0.17820	45	638
19	35.4916	2.52728	3	0.11670	27	245
20	37.8028	2.37791	4	0.13710	31	339
21	38.3000	2.34817	4	0.07420	29	162
22	38.6335	2.32867	26	0.17170	208	2043
23	40.7845	2.21068	5	0.13900	43	372
24	43.8193	2.06435	11	0.15870	90	815
25	45.1258	2.00757	3	0.09960	25	198
26	46.2144	1.96278	4	0.13110	31	340
27	47.1487	1.92604	3	0.11970	27	226
28	47.3728	1.91745	5	0.13430	38	261
29	48.0411	1.89233	4	0.18440	30	344
30	48.8069	1.86441	40	0.18800	326	3433
31	49.4731	1.84086	8	0.18370	68	716
32	50.7123	1.79874	5	0.10470	43	313
33	52.4825	1.74216	4	0.14500	32	352
34	53.2441	1.71902	4	0.14290	31	277
35	54.5710	1.68032	18	0.16690	145	1340
36	55.2266	1.66191	10	0.16890	81	785
37	57.3053	1.60647	7	0.17430	59	698
38	58.0200	1.58837	3	0.18660	25	228
39	58.2200	1.58339	3	0.40800	27	474
40	59.4904	1.55257	14	0.19340	113	1370
41	61.2661	1.51176	3	0.16780	28	345
42	61.9155	1.49746	6	0.20100	49	581
43	65.0400	1.43287	3	0.17140	25	210
44	65.2350	1.42905	5	0.19000	40	368

Lampiran E. Hasil Analisis IR

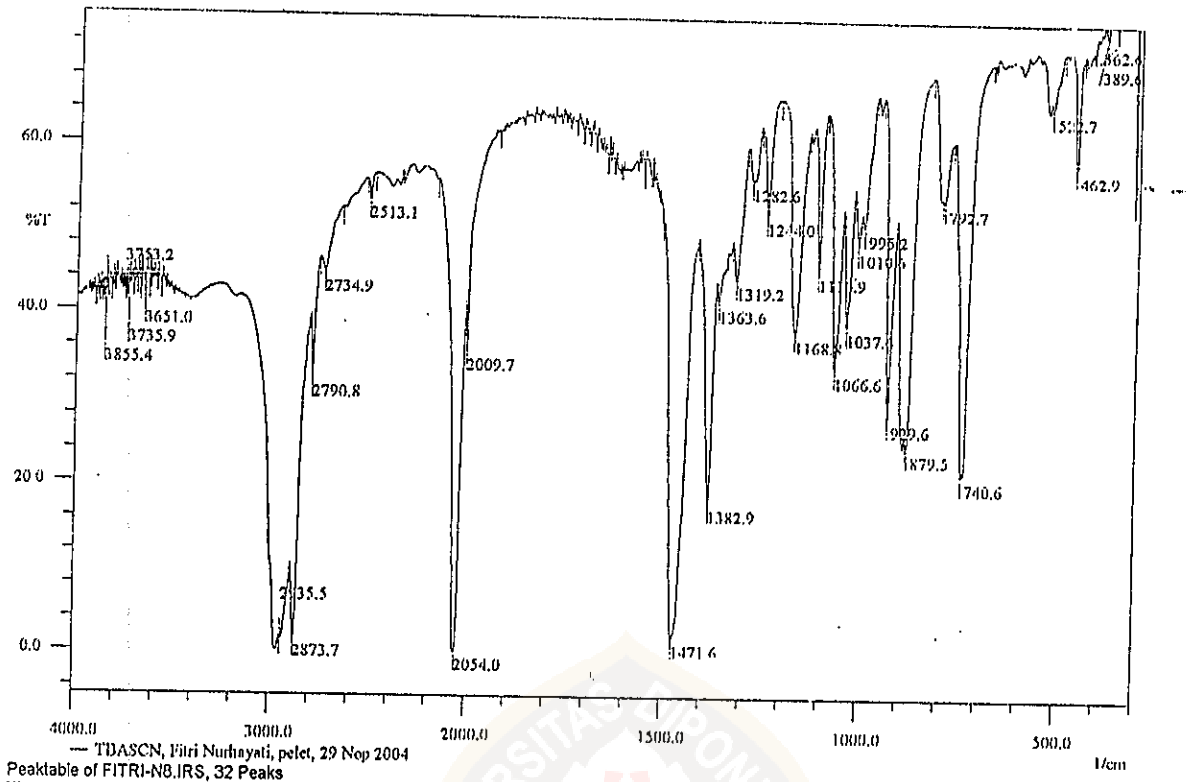


— CTMABr, Fitri Nuriayati, pelet, 29 Nop 2004

Peaktable of FITRI-N9.IRS, 32 Peaks
Threshhold: 80, Noise: 3.5, No Range Selection

Nr.	Pos. (1/cm)	Inten. (%T)
1	310.5	8.661
2	322.1	3.204
3	335.6	36.814
4	362.6	61.818
5	376.1	65.263
6	451.3	61.762
7	719.4	31.054
8	731.0	32.385
9	775.4	60.775
10	829.3	57.082
11	866.0	60.084
12	912.3	24.757
13	937.3	37.642
14	960.5	20.179
15	981.7	48.471
16	1012.6	57.316
17	1037.6	56.915
18	1141.8	57.758
19	1244.0	55.408
20	1363.6	54.126
21	1382.9	47.294
22	1396.4	41.033
23	1407.9	37.858
24	1431.1	38.488
25	1463.9	11.989
26	1473.5	10.661
27	1487.0	8.410
28	2426.3	48.551
29	2850.6	0.257
30	2918.1	0.092
31	3018.4	15.587
32	3423.4	34.208

Lampiran E (Lanjutan)



— TDASCN, Fitri Nurhayati, pelet, 29 Nop 2004
Peaktable of FITRI-N8.IRS, 32 Peaks
Threshhold: 80, Noise: 3, No Range Selection

Nr.	Pos. (1/cm)	Inten. (%T)
1	337.5	77.281
2	362.6	73.247
3	389.6	73.387
4	462.9	58.255
5	522.7	65.269
6	740.6	21.549
7	792.7	53.987
8	879.5	24.838
9	929.6	28.314
10	995.2	50.794
11	1010.6	48.884
12	1037.6	39.003
13	1066.6	33.908
14	1110.9	45.544
15	1168.8	36.051
16	1244.0	52.073
17	1282.6	56.146
18	1319.2	44.383
19	1363.6	41.644
20	1382.9	16.125
21	1471.6	1.878
22	2009.7	35.472
23	2054.0	0.120
24	2513.1	53.312
25	2734.9	44.541
26	2790.8	32.158
27	2873.7	1.547
28	2935.5	1.418
29	3651.0	40.490
30	3735.9	41.345
31	3753.2	40.896
32	3855.4	39.627

Lampiran F. Hasil Analisis Ukuran Pori dengan Persamaan BET

Quantachrome Corporation
NOVA Data Analysis Package Ver. 2.00
File Name = zctba01.dat

User ID	= Ahmad Suseno	User Setup	= 5
Sample ID	= ZCT BA 0,01	Sample Cell Number	= 4
Sample Weight	= 0.3568 g	Sample Volume	= 0.3568 cc
Sample Density	= 1.0000 g/cc		
Po Type	= User	Po	= 750.05 mm Hg
Adsorbate	= N2	Bath Temperature	= 77.40 deg K
Adsorption Tolerance	= 0.1000 mm Hg	Desorption Tolerance	= 0.0000 mm Hg
Adsorption Equil Time	= 60 sec	Desorption Equil Time	= 0 sec
Adsorption Dwell Time	= 180 sec	Desorption Dwell Time	= 0 sec
Analysis Start Time	= Wed Jan 19 09:41:57 2005	Analysis End Time	= Wed Jan 19 10:35:58 2005

BJH (Adsorption)

Pore Radius (Ang)	Cummulative Pore Area (sq m/g e-03)	Cummulative Pore Volume (cc/g e-03)
382.810938	5602.571067	7.142847
171.732434	5591.677667	6.934342
101.761102	5544.067290	6.525529
76.313241	5497.593019	6.289066
59.593695	5389.068831	5.874974
49.789434	5312.672164	5.647336
41.452715	5128.877068	5.189783
36.990697	4980.690183	4.882646
32.701007	4842.953730	4.627898
29.107044	4533.994285	4.122733
26.319590	4351.400447	3.856995
23.823873	3964.259747	3.347526
21.854179	3746.654608	3.088316
20.037759	3325.135950	2.627719
18.510214	3026.582698	2.328602
17.152857	2532.974001	1.871762
15.915264	2253.509329	1.632081
14.736811	1624.443895	1.131494
13.708858	1273.646118	0.873012

Total Pore Volume is 6.544668 e-03 cc/g for all pores less than 513.960078 Angstrom.

Average pore radius is 25.336483 Angstrom.

Lampiran F (Lanjutan)

Quantachrome Corporation
NOVA Data Analysis Package Ver. 2.00
File Name = zctba-05.dat

User ID	= Ahmad Suseno	User Setup	= 5
Sample ID	= Z CT BA 0,05	Sample Cell Number	= 4
Sample Weight	= 0.4818 g	Sample Volume	= 0.4818 cc
Sample Density	= 1.0000 g/cc		
Po Type	= User	Po	= 745.27 mm Hg
Adsorbate	= N2	Bath Temperature	= 77.40 deg K
Adsorption Tolerance	= 0.1000 mm Hg	Desorption Tolerance	= 0.0000 mm Hg
Adsorption Equil Time	= 60 sec	Desorption Equil Time	= 0 sec
Adsorption Dwell Time	= 180 sec	Desorption Dwell Time	= 0 sec
Analysis Start Time	= Fri Jan 14 13:14:05 2005	Analysis End Time	= Fri Jan 14 14:15:51 2005

BJH (Adsorption)

Pore Radius (Ang)	Cummulative Pore Area (sq m/g e-03)	Cummulative Pore Volume (cc/g e-03)
409.880235	4038.166492	5.192625
169.455834	4032.095507	5.068206
102.542617	3963.664973	4.488408
77.138297	3940.184928	4.368023
59.677271	3873.399311	4.110436
49.535138	3824.473969	3.964450
41.076143	3711.440133	3.684493
36.017077	3605.819504	3.467568
32.172755	3531.615063	3.333937
29.333754	3432.442954	3.174405
26.352399	3299.012893	2.978705
23.778713	3012.186087	2.600776
21.809109	2831.055686	2.385423
20.038735	2489.613512	2.013096
18.539847	2269.546143	1.792602
17.153594	1896.192729	1.446507
15.916958	1701.555749	1.279570
14.774601	820.182055	0.578131
13.728017	530.933852	0.364455

Total Pore Volume is 5.294914 e-03 cc/g for all pores less than 572.163622 Angstrom.

Average pore radius is 22.840671 Angstrom.

Lampiran F (Lanjutan)

...uran Pori ZCBA

Quantachrome Corporation
NOVA Data Analysis Package Ver. 2.00
File Name = zctba24.dat

...r ID	= Ahmad Suseno	User Setup	= 5
Sample ID	= Z-CT-BA-24	Sample Cell Number	= 2
Sample Weight	= 0.4735 g	Sample Volume	= 0.4735 cc
Sample Density	= 1.0000 g/cc		
Po Type	= User	Po	= 749.00 mm Hg
Adsorbate	= N2	Bath Temperature	= 77.40 deg K
Adsorption Tolerance	= 0.1000 mm Hg	Desorption Tolerance	= 0.0000 mm Hg
Adsorption Equil Time	= 60 sec	Desorption Equil Time	= 0 sec
Adsorption Dwell Time	= 180 sec	Desorption Dwell Time	= 0 sec
Analysis Start Time	= Wed Nov 03 08:55:57 2004	Analysis End Time	= Wed Nov 03 09:59:07 2004

DVR (Adsorption)

Pore Radius (Ang)	Pore Area (sq m/Å/g e-03)	Pore Volume (cc/Å/g e-03)
646.920433	0.099353	0.003214
157.317412	1.613952	0.012695
108.057926	11.003740	0.059452
75.337968	36.141999	0.136143
59.192843	72.464400	0.214469
49.620461	91.693331	0.227493
41.990423	205.978384	0.432456
37.300337	992.318508	1.850691
32.551701	791.491342	1.288219
29.155027	358.591238	0.522737
26.711835	647.692754	0.865053
24.153639	881.789396	1.064921
21.791600	1484.860547	1.617874
20.074058	1040.026597	1.043878
18.686724	2291.981900	2.141482
17.089460	2351.301135	2.009123
15.877926	2294.097102	1.821275
14.748914	3223.461766	2.377128
13.702538	3475.589295	2.381220

Total Pore Volume is 53.497470 e-03 cc/g for all pores less than 1078.753821 Angstrom.

Average pore radius is 27.510943 Angstrom.