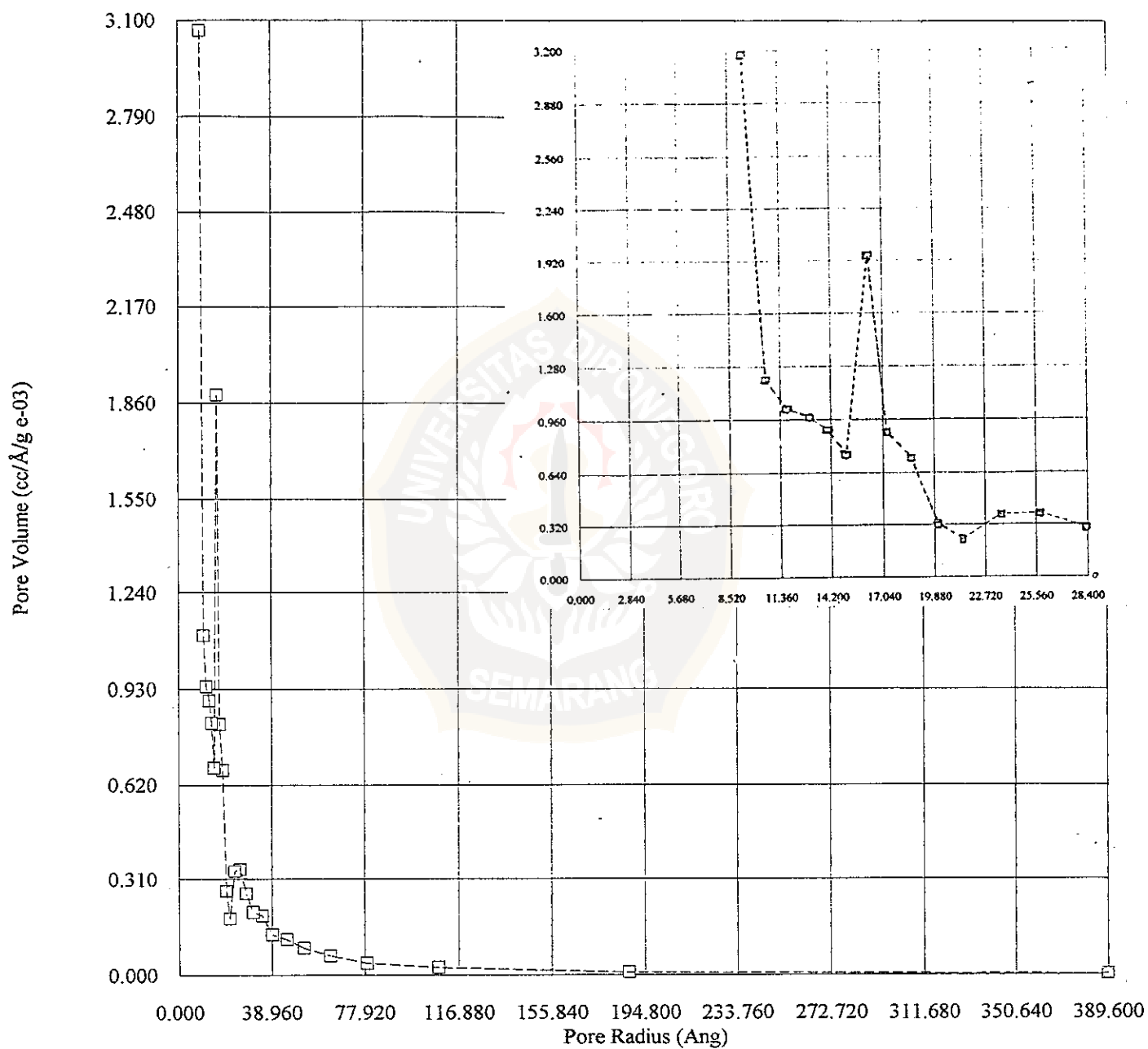


Lampiran 1

Grafik Jari-Jari Pori ZA



Lampiran 2

Tabel Penentuan Radius Rata-Rata dan Total Volume ZA

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

User ID	= yuli	User Setup	= 2
Sample ID	= ZA	Sample Cell Number	= 4
Sample Weight	= 0.2118 g	Sample Volume	= 0.2118 cc
Sample Density	= 1.0000 g/cc		
Po Type	= User	Po	= 770.00 mm Hg
Adsorbate	= Nitrogen	Bath Temperature	= 77.35 deg K
Adsorption Tolerance	= 0.1000 mm Hg	Desorption Tolerance	= 0.1000 mm Hg
Adsorption Equil Time	= 60 sec	Desorption Equil Time	= 60 sec
Adsorption Dwell Time	= 120 sec	Desorption Dwell Time	= 120 sec
Analysis Start Time	= Tue Jan 30 08:39:07 1996	Analysis End Time	= Tue Jan 30 08:39:07 1996

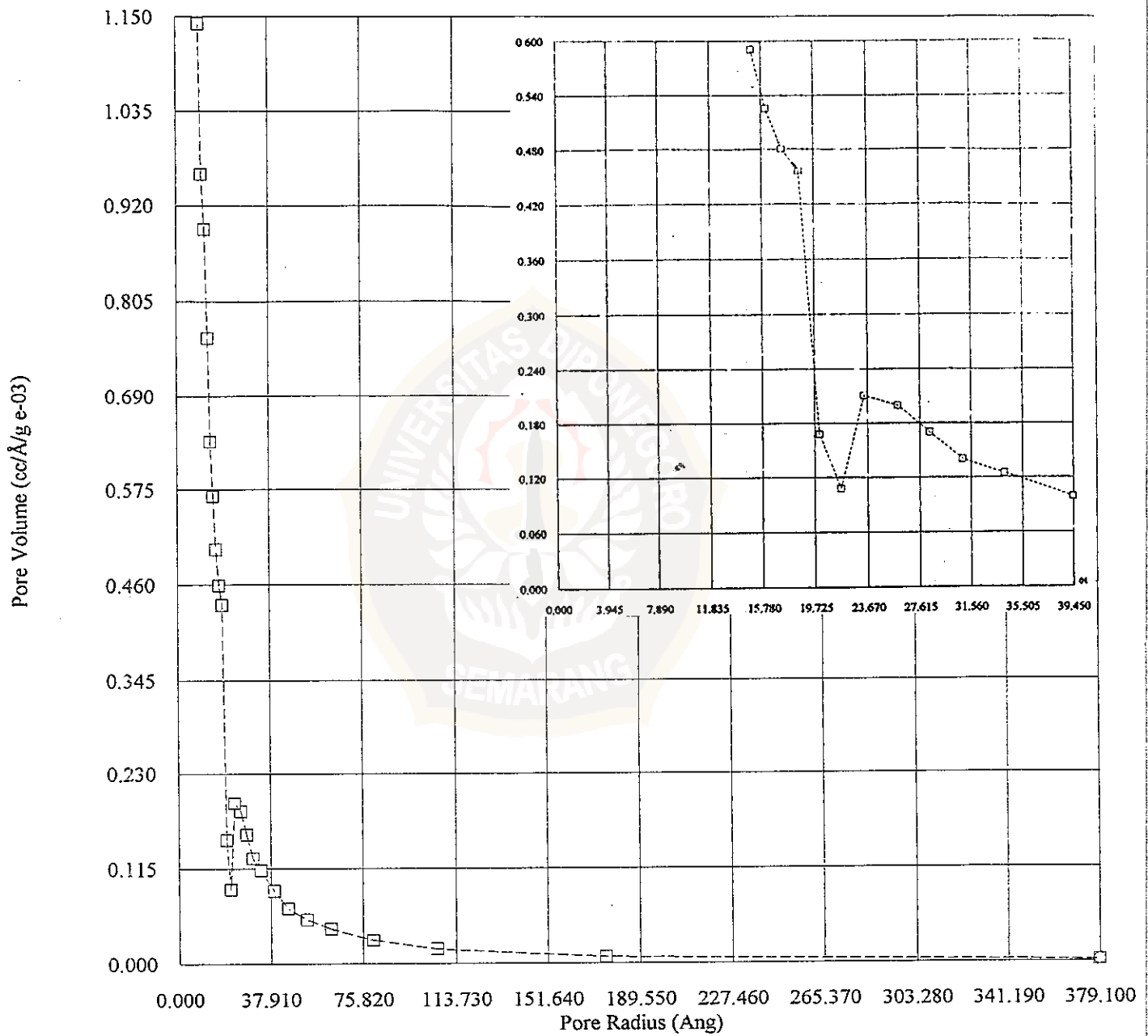
Pore Radius (Ang)	DVR (Adsorption)		Pore Volume (cc/Å/g e-03)
	Pore Area (sq m/Å/g e-03)	Pore Volume (cc/Å/g e-03)	
389.567823	0.116520	0.002270	
188.137319	0.833778	0.007843	
108.732739	4.263048	0.023177	
78.869730	9.305969	0.036698	
63.715287	19.046563	0.060678	
52.560284	32.629993	0.085752	
45.312574	50.251547	0.113851	
39.252276	65.977027	0.129487	
34.926850	109.240574	0.190771	
31.282975	129.379258	0.202368	
28.365257	184.503962	0.261675	
25.797040	265.097370	0.341936	
23.612834	283.423813	0.334622	
21.463926	168.284362	0.180602	
20.085125	269.638792	0.270786	
18.588714	718.136854	0.667462	
17.266451	945.851253	0.816575	
16.259451	2320.750540	1.886707	
15.016242	898.455014	0.674571	
13.997296	1172.981172	0.820928	
13.001217	1371.784045	0.891743	
11.744037	1597.876296	0.938276	
10.542043	2090.294937	1.101799	
9.364500	6548.295224	3.066075	

Total Pore Volume is 27.108689 e-03 cc/g for all pores less than 511.621451 Angstrom.

Average pore radius is 116.684451 Angstrom.

Lampiran 3

Grafik Jari-Jari Pori ZH1



Lampiran 4

Tabel Penentuan Radius Rata-Rata dan Total Volume ZHI

Quantachrome Corporation
NOVA Data Analysis Package Ver. 2.00
File Name = und-01.dat

User ID	= Heri Cahyadi	User Setup	= 3
Sample ID	= und-01	Sample Cell Number	= 4
Sample Weight	= 0.2888 g	Sample Volume	= 0.2888 cc
Sample Density	= 1.0000 g/cc		
Po Type	= User	Po	= 770.00 mm Hg
Adsorbate	= Nitrogen	Bath Temperature	= 77.35 deg K
Adsorption Tolerance	= 0.1000 mm Hg	Desorption Tolerance	= 0.1000 mm Hg
Adsorption Equil Time	= 60 sec	Desorption Equil Time	= 60 sec
Adsorption Dwell Time	= 120 sec	Desorption Dwell Time	= 120 sec
Analysis Start Time	= Wed Mar 27 09:17:07 2002	Analysis End Time	= Wed Mar 27 09:17:07 2002

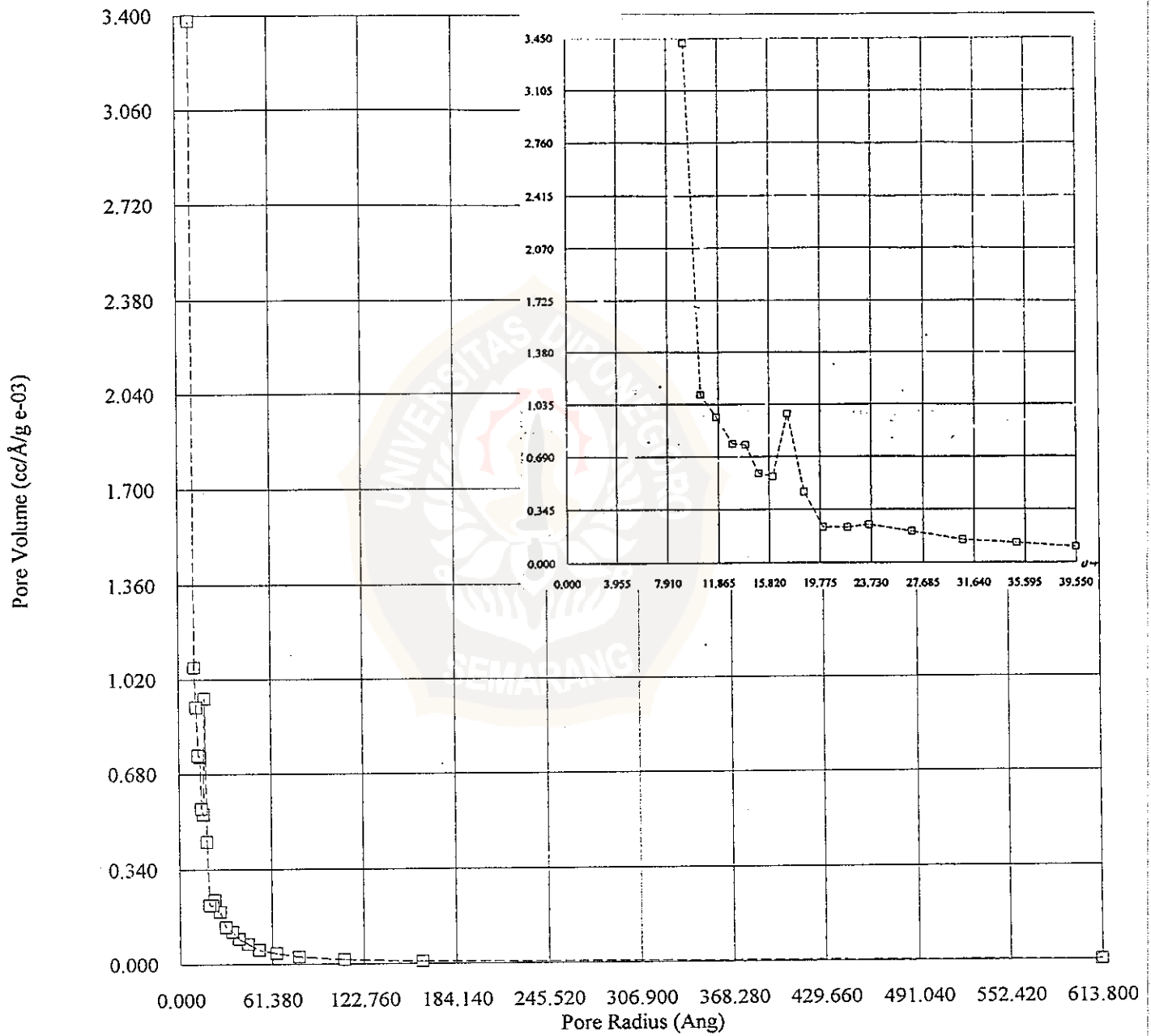
Pore Radius (Ang)	DVR (Adsorption)		Pore Volume (cc/A/g e-03)
	Pore Area (sq m/A/g e-03)		
379.062770	0.093066		0.001764
175.590274	0.828194		0.007271
106.119408	3.245880		0.017223
80.118111	7.050629		0.028244
62.850261	13.469727		0.042329
52.926972	20.158590		0.053347
45.176522	29.468670		0.066565
39.428582	44.739477		0.088201
34.107430	66.164101		0.112834
30.894938	82.378360		0.127254
28.366668	109.943747		0.155937
25.931427	142.470386		0.184723
23.415689	166.039251		0.194396
21.639449	83.280148		0.090107
20.070151	148.586812		0.149108
18.603521	468.408195		0.435702
17.314746	530.082577		0.458912
16.114257	623.940500		0.502717
15.038582	753.520973		0.566594

Total Pore Volume is 14.946891 e-03 cc/g for
all pores less than 503.490434 Angstrom.

Average pore radius is 17.607584 Angstrom.

Lampiran 5

Grafik Jari-Jari Pori ZH2



Lampiran 6

Tabel Penentuan Radius Rata-Rata dan Total Volume ZH2

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

User ID	= Heri	User Setup	= 3
Sample ID	= und05	Sample Cell Number	= 4
Sample Weight	= 0.2889 g	Sample Volume	= 0.2889 cc
Sample Density	= 1.0000 g/cc		
Po Type	= User	Po	= 751.11 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	= Thu Mar 28 09:35:07 2002	Analysis End Time	= Thu Mar 28 10:41:35 2002

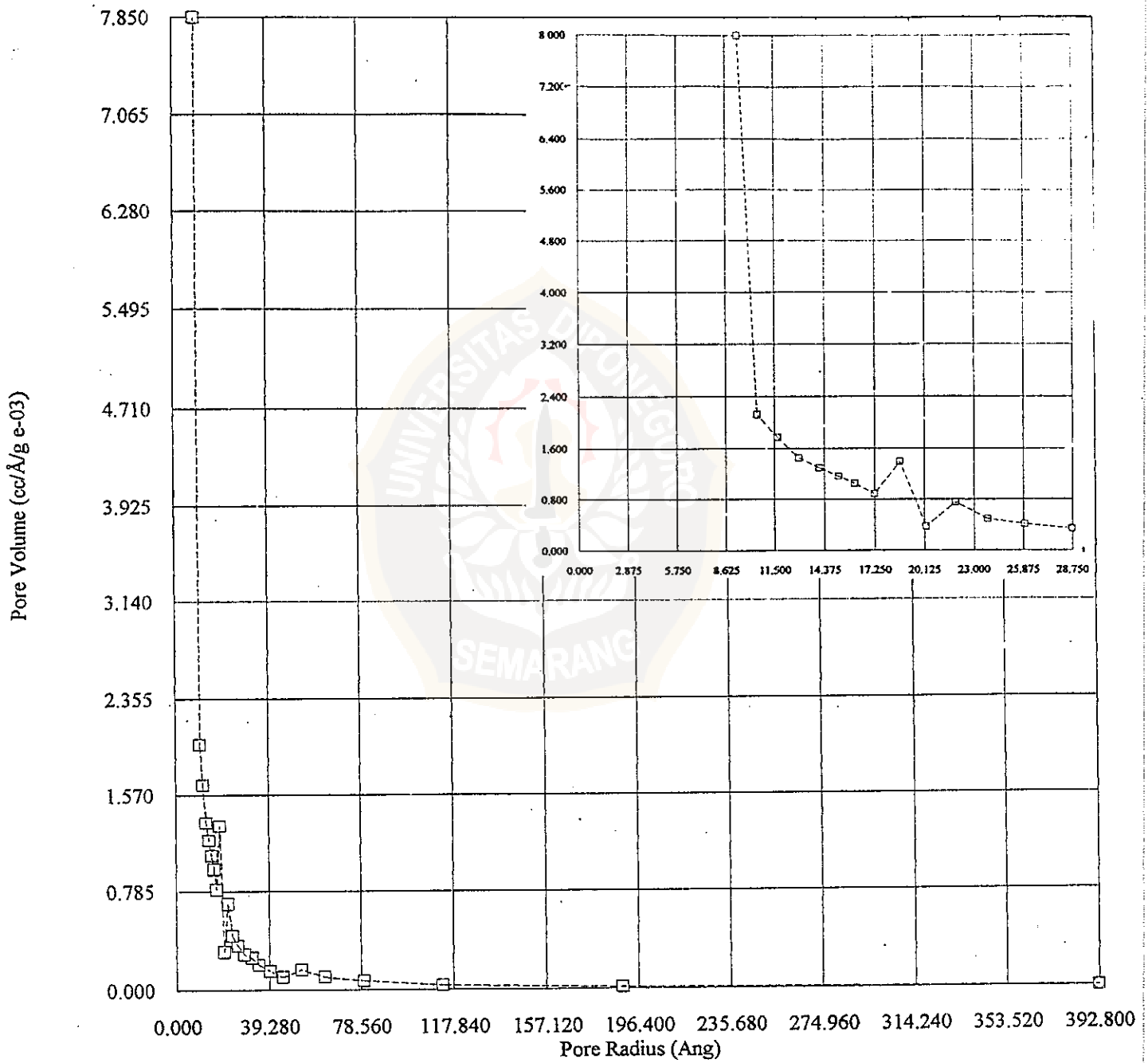
Pore Radius (Ang)	DVR (Adsorption)	
	Pore Area (sq m/Å/g e-03)	Pore Volume (cc/Å/g e-03)
513.787615	0.029855	0.000916
161.595467	0.840820	0.006794
109.908104	2.515182	0.013822
79.682685	6.161988	0.024550
64.474024	11.596511	0.037384
52.833610	18.761959	0.049563
45.432144	31.571109	0.071717
39.513503	45.780340	0.090447
34.945055	65.259971	0.115773
30.774095	86.444678	0.153013
28.327883	114.191227	0.161740
25.767673	161.429507	0.207983
23.561729	195.861274	0.230742
21.915262	193.087724	0.211578
20.012057	212.371084	0.212499
18.557774	472.715354	0.438627
17.277446	1100.016969	0.950274
16.103468	265.817634	0.536099
15.027391	739.243631	0.555445
13.997889	1058.289188	0.740691

Total Pore Volume is 20.221819 e-03 cc/g for
all pores less than 1009.059797 Angstrom.

Average pore radius is 14.643920 Angstrom.

Lampiran 7

Grafik Jari-Jari Pori ZH3



Lampiran 8

Tabel Penentuan Radius Rata-Rata dan Total Volume ZH3

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

User ID	= heri	User Setup	= 3
Sample ID	= 0,05	Sample Cell Number	= 4
Sample Weight	= 0.1489 g	Sample Volume	= 0.1489 cc
Sample Density	= 1.0000 g/cc		
Po Type	= User	Po	= 770.00 mm Hg
Adsorbate	= Nitrogen	Bath Temperature	= 77.35 deg K
Adsorption Tolerance	= 0.1000 mm Hg	Desorption Tolerance	= 0.1000 mm Hg
Adsorption Equil Time	= 60 sec	Desorption Equil Time	= 60 sec
Adsorption Dwell Time	= 120 sec	Desorption Dwell Time	= 120 sec
Analysis Start Time	= Sat Mar 09 13:19:54 2002	Analysis End Time	= Sat Mar 09 13:19:54 2002

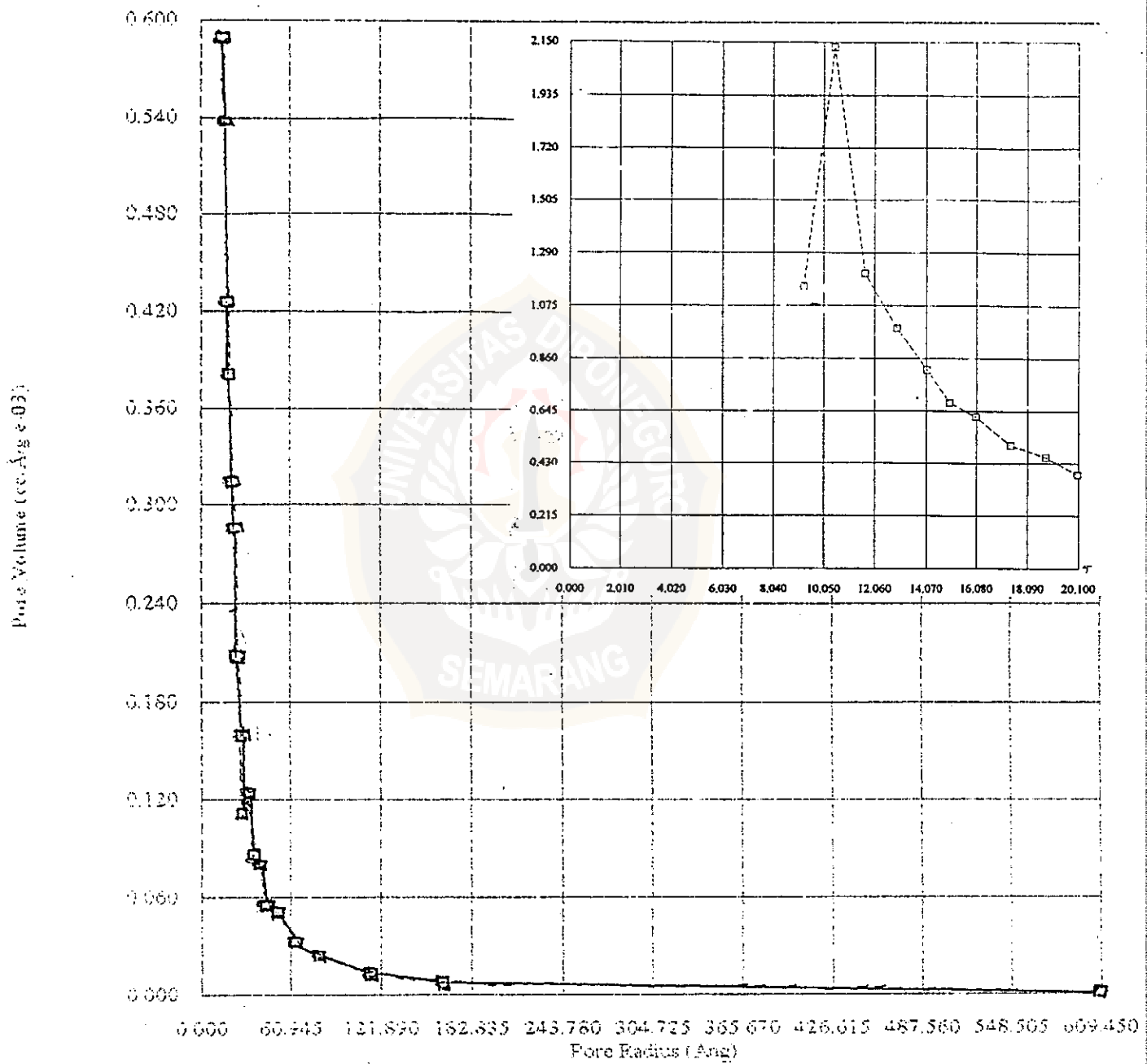
Pore Radius (Ang)	DVR (Adsorption)	
	Pore Area (sq m/Å/g e-03)	Pore Volume (cc/Å/g e-03)
392.784331	0.160371	0.003150
189.580747	1.329413	0.012602
113.201686	6.018858	0.034067
79.708327	17.663404	0.070396
62.945417	32.473891	0.102204
53.117205	59.763434	0.158723
45.066199	44.738433	0.100810
39.553574	75.164590	0.148651
35.029449	111.435469	0.195176
31.996290	159.486218	0.255148
28.718726	195.965175	0.281394
25.947751	270.487736	0.350927
23.786156	361.198503	0.429576
21.928834	624.004542	0.684185
20.223735	298.700402	0.302042
18.681902	1406.720444	1.314011
17.230728	925.617467	0.797453
16.106173	1187.584321	0.956372
15.182382	1404.539974	1.066213
14.086851	1692.633406	1.192194
12.915179	2076.964396	1.341218
11.689713	2818.847060	1.647576
10.488464	3785.867358	1.985397
9.364632	16763.135347	7.849030

Total Pore Volume is 67.040741 e-03 cc/g for
all pores less than 517.549630 Angstrom.

Average pore radius is 115.285135 Angstrom.

Lampiran 9

Grafik Jari-Jari Pori ZH4



Lampiran 10

Tabel Penentuan Radius Rata-Rata dan Total Volume ZH4

Quantachrome Corporation
NOVA Data Analysis Package Ver. 2.00
File Name = und5.dat

User ID	= Heri	User Setup	= 3
Sample ID	= und5	Sample Cell Number	= 2
Sample Weight	= 0.1725 g	Sample Volume	= 0.1725 cc
Sample Density	= 1.0000 g/cc		
Po Type	= User	Po	= 750.62 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	= 50 sec	Desorption Equil Time	= 0 sec
Adsorption Dwell Time	= 180 sec	Desorption Dwell Time	= 0 sec
Analysis Start Time	= Wed Mar 27 10:48:14 2002	Analysis End Time	= Wed Mar 27 11:46:09 2002

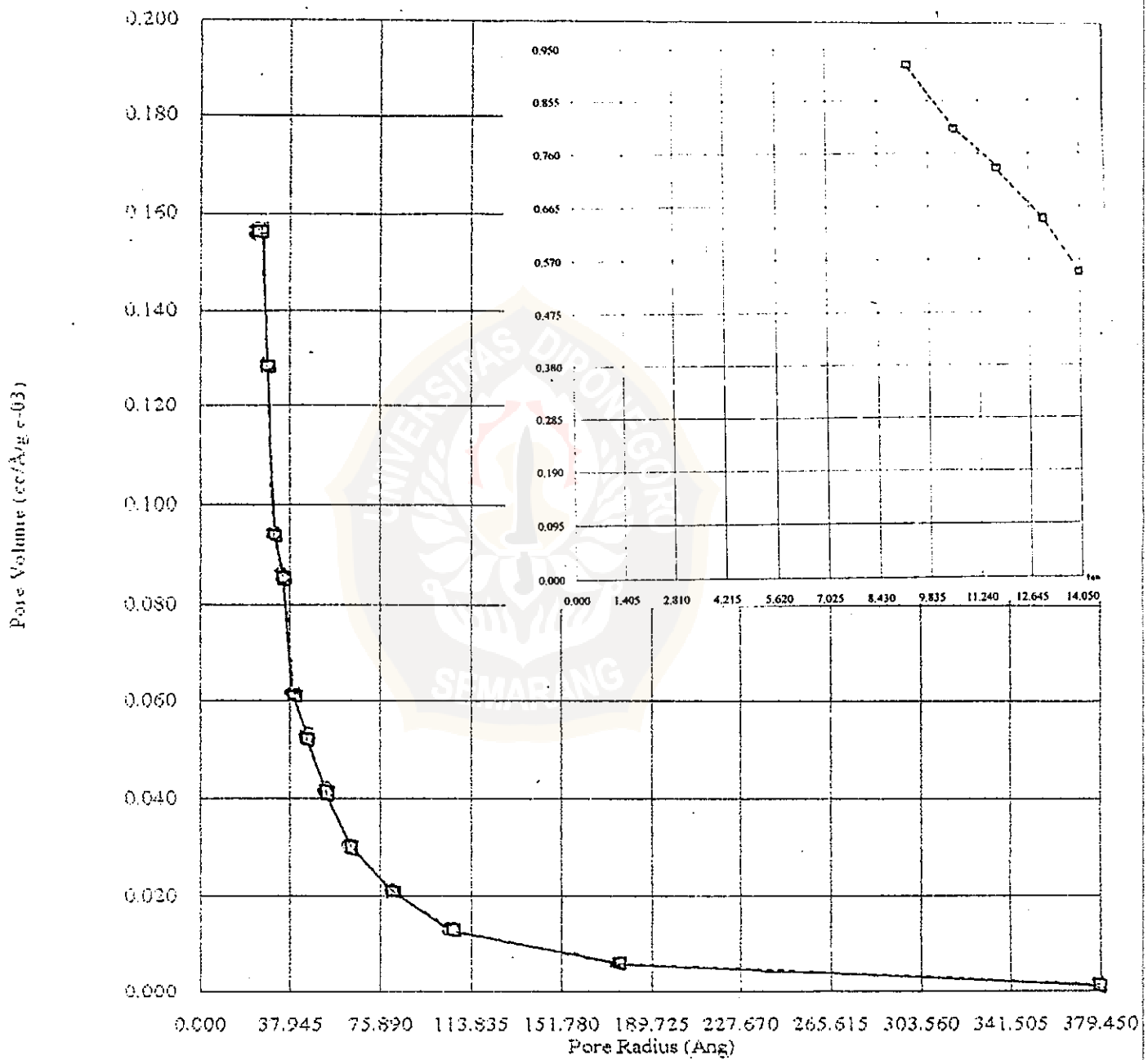
Pore Radius (Ang)	DVR (Adsorption)	
	Pore Area (sq m/Å/g e-03)	Pore Volume (cc/Å/g e-03)
609.420059	0.029287	0.000892
162.740129	0.847107	0.006893
115.996313	2.502595	0.013125
80.123895	5.872964	0.023528
53.083944	9.799458	0.030909
52.850461	19.173754	0.050667
44.899004	23.706379	0.058220
39.477221	40.764353	0.080463
34.845959	48.205558	0.083988
31.376277	78.808539	0.123636
28.309499	77.753146	0.110114
26.121555	122.109148	0.159484
23.773752	175.222533	0.208235
21.607236	263.526753	0.285136
20.056612	313.018932	0.313905
18.827431	405.056599	0.381309
17.425078	488.484264	0.425594
16.055348	668.777120	0.536872
15.011506	783.010136	0.589209

Total Pore Volume is 13.500955 e-03 cc/g for
all pores less than 1000.111085 Angstrom.

Average pore radius is 17.283912 Angstrom.

Lampiran 11

Grafik Jari-Jari Pori ZH5



Lampiran 12

Tabel Penentuan Radius Rata-Rata dan Total Volume ZH5

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

User ID	=	User Setup	= 3
Sample ID	=	Sample Cell Number	= 4
Sample Weight	= 0.2682 g	Sample Volume	= 0.2682 cc
Sample Density	= 1.0000 g/cc		
Po Type	= User	Po	= 751.09 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 23 09:15:22 2002	Analysis End Time	= Wed Jan 23 10:11:03 2002

Pore Radius (Ang)	DVR (Adsorption)		Pore Volume (cc/Å/g e-03)
	Pore Area (sq m/Å/g e-03)		
379.430863	0.071803		0.001362
176.820711	0.686746		0.006072
106.796845	2.422430		0.012935
80.597503	5.210701		0.020998
62.963004	9.524086		0.029983
52.827438	15.539678		0.041046
44.275240	23.571354		0.052181
39.627832	31.009673		0.061442
35.056025	48.771209		0.085486
30.866173	60.936325		0.094044
28.394374	90.568609		0.123582
26.020098	120.831099		0.157202
23.454943	133.232213		0.156248

Total Pore Volume is 8.477947 e-03 cc/g for
all pores less than 502.291177 Angstrom.

Average pore radius is 22.170421 Angstrom.

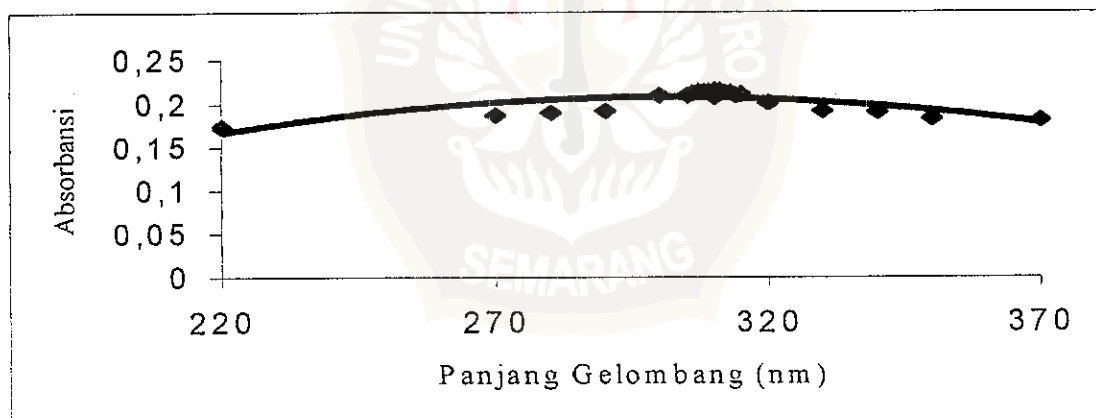
Lampiran 13

Penentuan Absorbansi Optimum

λ	220	270	280	290	300	305	306	307	308	309
Abs.	0,174	0,187	0,190	0,192	0,210	0,210	0,212	0,214	0,214	0,214

λ	310	311	312	313	314	315	320	330	340
Abs.	0,215	0,215	0,213	0,213	0,210	0,211	0,201	0,192	0,191

λ	350	370
Abs.	0,183	0,181



Lampiran 14

Penghitungan Kadar Asam Oleat

Rumus dasar: $A = \epsilon b c$

Dengan A = Absorbansi

ϵ = ekstensi molar

b = tebal sampel

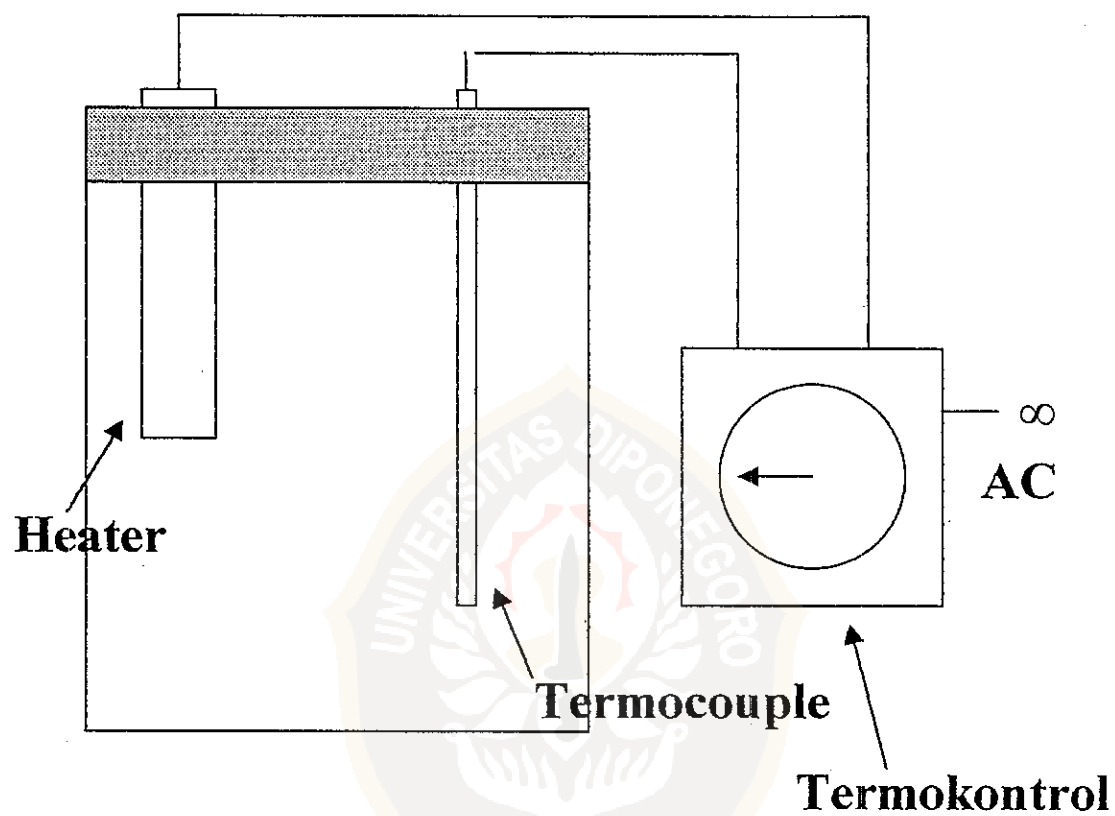
c = konsentrasi

	ZA	ZH1	ZH2	ZH3	ZH4	ZH5
Ads.	0,215	0,194	0,200	0,294	0,330	0,424
C (ppm)	4,27	3,86	3,97	5,84	6,55	8,42



Lampiran 15

Skema Autoklaf



Lampiran 16

Skema Alat Kalsinasi

