

**Lampiran I. Hasil Pembacaan Ukuran Partikel Menggunakan Particle Size Analyzer Pada Formula Nanopartikel PVA 1%**

**HORIBA**  
Scientific

HORIBA SZ-100 for Windows [Z Type] Ver2.00

**SZ-100**

**F2 1 % R2.nsz**

**Measurement Results**

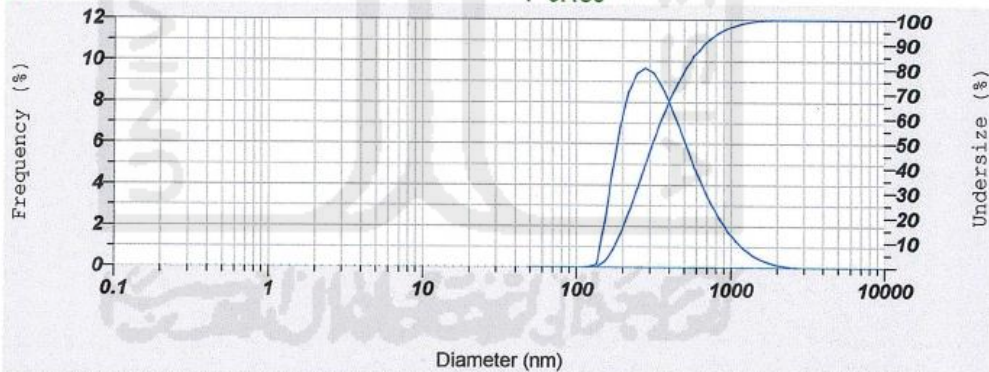
Date : Thursday, December 15, 2016 11:24:05  
 Measurement Type : Particle Size  
 Sample Name : Vitamin C Palmitat 1 %  
 Scattering Angle : 90  
 Temperature of the Holder : 24.9 deg. C  
 Dispersion Medium Viscosity : 0.897 mPa.s  
 Transmission Intensity before Meas. : 34651  
 Distribution Form : [Standard]  
 Distribution Form(Dispersity) : Monodisperse  
 Representation of Result : Scattering Light Intensity  
 Count Rate : 1968 kCPS

**Calculation Results**

Peak No.	S.P.Area Ratio	Mean	S. D.	Mode
1	1.00	384.8 nm	239.8 nm	262.6 nm
2	---	--- nm	--- nm	--- nm
3	---	--- nm	--- nm	--- nm
Total	1.00	384.8 nm	239.8 nm	262.6 nm

**Cumulant Operations**

Z-Average : 332.1 nm  
 PI : 0.180



No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation
1	0.34	0.000	0.000	23	4.97	0.000	0.000	45	72.87	0.000	0.000	67	1068.52	1.266	97.651
2	0.38	0.000	0.000	24	5.51	0.000	0.000	46	82.33	0.000	0.000	68	1207.24	0.904	98.555
3	0.43	0.000	0.000	25	6.34	0.000	0.000	47	93.02	0.000	0.000	69	1363.97	0.511	99.166
4	0.49	0.000	0.000	26	7.17	0.000	0.000	48	105.10	0.000	0.000	70	1541.04	0.394	99.560
5	0.55	0.000	0.000	27	8.10	0.000	0.000	49	118.74	0.002	0.000	71	1741.10	0.237	99.796
6	0.62	0.000	0.000	28	9.15	0.000	0.000	50	134.16	0.130	0.130	72	1967.14	0.128	99.924
7	0.70	0.000	0.000	29	10.34	0.000	0.000	51	151.57	2.154	2.284	73	2222.51	0.057	99.982
8	0.80	0.000	0.000	30	11.68	0.000	0.000	52	171.25	4.679	6.962	74	2511.05	0.017	99.998
9	0.90	0.000	0.000	31	13.20	0.000	0.000	53	193.48	6.891	13.853	75	2837.04	0.000	99.998
10	1.02	0.000	0.000	32	14.91	0.000	0.000	54	218.60	8.477	22.331	76	3205.35	0.000	99.998
11	1.15	0.000	0.000	33	16.84	0.000	0.000	55	246.98	9.376	31.709	77	3621.48	0.000	99.998
12	1.30	0.000	0.000	34	19.03	0.000	0.000	56	279.04	9.654	41.363	78	4091.83	0.000	99.998
13	1.47	0.000	0.000	35	21.50	0.000	0.000	57	315.27	9.419	50.782	79	4622.81	0.000	99.998
14	1.66	0.000	0.000	36	24.29	0.000	0.000	58	356.20	8.803	59.585	80	5222.96	0.000	99.998
15	1.87	0.000	0.000	37	27.45	0.000	0.000	59	402.44	7.937	67.522	81	5901.02	0.000	99.998
16	2.11	0.000	0.000	38	31.01	0.000	0.000	60	454.69	6.934	74.456	82	6667.10	0.000	99.998
17	2.39	0.000	0.000	39	35.03	0.000	0.000	61	513.71	5.698	80.343	83	7532.65	0.000	99.998
18	2.70	0.000	0.000	40	39.58	0.000	0.000	62	580.41	4.689	85.212	84	8510.56	0.000	99.998
19	3.05	0.000	0.000	41	44.72	0.000	0.000	63	655.76	3.926	89.138	85	9615.42	0.000	99.998
20	3.45	0.000	0.000	42	50.53	0.000	0.000	64	740.89	3.088	92.226	86	10863.72	0.000	100.000
21	3.89	0.000	0.000	43	57.09	0.000	0.000	65	837.07	2.399	94.595				
22	4.40	0.000	0.000	44	64.50	0.000	0.000	66	945.74	1.770	96.365				

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**Lampiran II. Hasil Pembacaan Ukuran Partikel Menggunakan Particle Size Analyzer Pada Formula Nanopartikel PVA 2,5% mg.**

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HORIBA SZ-100 for Windows [Z Type] Ver2.00

**SZ-100**

**F1 2,5 % R1.nsz**  
**Measurement Results**

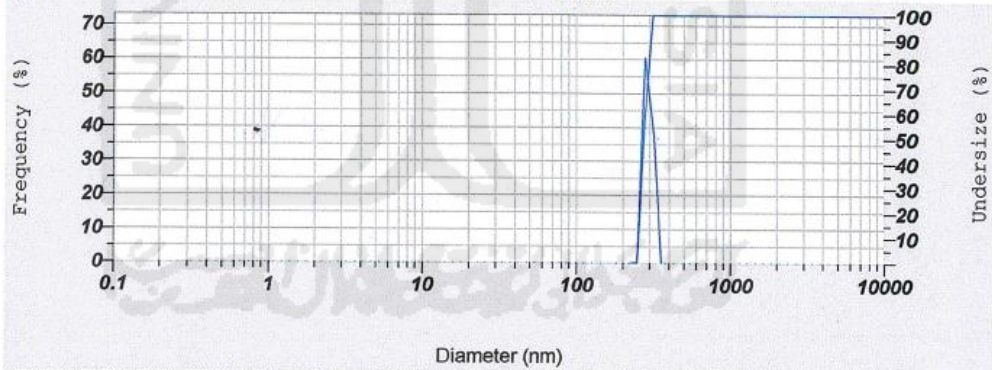
Date : Thursday, December 15, 2016 11:09:34  
 Measurement Type : Particle Size  
 Sample Name : Vitamin C palmitat 2,5  
 Scattering Angle : 90  
 Temperature of the Holder : 24.9 deg. C  
 Dispersion Medium Viscosity : 0.897 mPa.s  
 Transmission Intensity before Meas. : 33181  
 Distribution Form : Narrow  
 Distribution Form(Dispersity) : Monodisperse  
 Representation of Result : Scattering Light Intensity  
 Count Rate : 1338 kCPS

**Calculation Results**

Peak No.	S.P.Area Ratio	Mean	S. D.	Mode
1	1.00	275.9 nm	16.7 nm	273.2 nm
2	---	--- nm	--- nm	--- nm
3	---	--- nm	--- nm	--- nm
Total	1.00	275.9 nm	16.7 nm	273.2 nm

**Cumulant Operations**

Z-Average : 273.7 nm  
 PI : 0.164



No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation
1	0.34	0.000	0.000	23	4.97	0.000	0.000	45	72.87	0.000	0.000	67	1058.52	0.000	100.000
2	0.38	0.000	0.000	24	5.61	0.000	0.000	46	82.33	0.000	0.000	68	1207.24	0.000	100.000
3	0.43	0.000	0.000	25	6.34	0.000	0.000	47	93.02	0.000	0.000	69	1363.97	0.000	100.000
4	0.49	0.000	0.000	26	7.17	0.000	0.000	48	105.10	0.000	0.000	70	1541.04	0.000	100.000
5	0.55	0.000	0.000	27	8.10	0.000	0.000	49	118.74	0.000	0.000	71	1741.10	0.000	100.000
6	0.62	0.000	0.000	28	9.15	0.000	0.000	50	134.16	0.000	0.000	72	1967.14	0.000	100.000
7	0.70	0.000	0.000	29	10.34	0.000	0.000	51	151.25	0.000	0.000	73	2222.51	0.000	100.000
8	0.80	0.000	0.000	30	11.68	0.000	0.000	52	171.25	0.000	0.000	74	2511.05	0.000	100.000
9	0.90	0.000	0.000	31	13.20	0.000	0.000	53	193.48	0.000	0.000	75	2837.04	0.000	100.000
10	1.02	0.000	0.000	32	14.91	0.000	0.000	54	218.60	0.000	0.000	76	3205.35	0.000	100.000
11	1.15	0.000	0.000	33	16.84	0.000	0.000	55	246.98	0.129	0.129	77	3621.48	0.000	100.000
12	1.30	0.000	0.000	34	19.03	0.000	0.000	56	279.04	60.381	60.510	78	4091.63	0.000	100.000
13	1.47	0.000	0.000	35	21.50	0.000	0.000	57	315.27	39.490	100.000	79	4622.81	0.000	100.000
14	1.66	0.000	0.000	36	24.29	0.000	0.000	58	356.20	0.000	100.000	80	5222.96	0.000	100.000
15	1.87	0.000	0.000	37	27.45	0.000	0.000	59	402.44	0.000	100.000	81	5901.02	0.000	100.000
16	2.11	0.000	0.000	38	31.01	0.000	0.000	60	454.69	0.000	100.000	82	6667.10	0.000	100.000
17	2.39	0.000	0.000	39	35.03	0.000	0.000	61	513.71	0.000	100.000	83	7532.65	0.000	100.000
18	2.70	0.000	0.000	40	39.58	0.000	0.000	62	580.41	0.000	100.000	84	8510.56	0.000	100.000
19	3.05	0.000	0.000	41	44.72	0.000	0.000	63	655.76	0.000	100.000	85	9616.42	0.000	100.000
20	3.45	0.000	0.000	42	50.53	0.000	0.000	64	740.69	0.000	100.000	86	10863.72	0.000	100.000
21	3.89	0.000	0.000	43	57.09	0.000	0.000	65	837.07	0.000	100.000				
22	4.40	0.000	0.000	44	64.50	0.000	0.000	66	945.74	0.000	100.000				

**Lampiran III.** Hasil Pembacaan Ukuran Partikel Menggunakan *Particle Size Analyzer* Pada Formula Nanopartikel PVA 5% mg.

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HORIBA SZ-100 for Windows [Z Type] Ver2.00

**SZ-100**

**F3 5 % R3.nsz**

**Measurement Results**

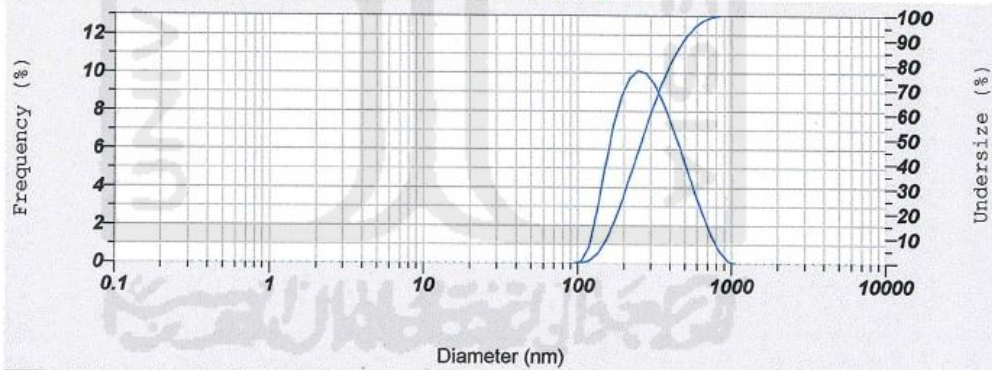
Date : Thursday, December 15, 2016 11:31:37  
 Measurement Type : Particle Size  
 Sample Name : Vitamin C Palmitat 5 %  
 Scattering Angle : 90  
 Temperature of the Holder : 24.9 deg. C  
 Dispersion Medium Viscosity : 0.897 mPa.s  
 Transmission Intensity before Meas. : 35870  
 Distribution Form : |Standard|  
 Distribution Form(Dispersity) : Monodisperse  
 Representation of Result : Scattering Light Intensity  
 Count Rate : 2545 kCPS

**Calculation Results**

Peak No.	S.P.Area Ratio	Mean	S. D.	Mode
1	1.00	297.0 nm	137.2 nm	232.7 nm
2	---	--- nm	--- nm	--- nm
3	---	--- nm	--- nm	--- nm
Total	1.00	297.0 nm	137.2 nm	232.7 nm

**Cumulant Operations**

Z-Average : 290.4 nm  
 PI : 0.140



No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation	No.	Diameter	Frequency	Cumulation
1	0.34	0.000	0.000	23	4.97	0.000	0.000	45	72.87	0.000	0.000	67	1068.52	0.000	100.000
2	0.38	0.000	0.000	24	5.61	0.000	0.000	46	82.33	0.000	0.000	68	1207.24	0.000	100.000
3	0.43	0.000	0.000	25	6.34	0.000	0.000	47	93.02	0.000	0.000	69	1363.97	0.000	100.000
4	0.49	0.000	0.000	26	7.17	0.000	0.000	48	105.10	0.000	0.000	70	1541.04	0.000	100.000
5	0.55	0.000	0.000	27	8.10	0.000	0.000	49	118.74	0.861	0.954	71	1741.10	0.000	100.000
6	0.62	0.000	0.000	28	9.15	0.000	0.000	50	134.16	2.895	3.848	72	1967.14	0.000	100.000
7	0.70	0.000	0.000	29	10.34	0.000	0.000	51	151.57	5.216	9.064	73	2222.51	0.000	100.000
8	0.80	0.000	0.000	30	11.68	0.000	0.000	52	171.25	7.261	16.325	74	2511.05	0.000	100.000
9	0.90	0.000	0.000	31	13.20	0.000	0.000	53	193.48	8.789	25.114	75	2837.04	0.000	100.000
10	1.02	0.000	0.000	32	14.91	0.000	0.000	54	218.80	9.730	34.844	76	3206.35	0.000	100.000
11	1.15	0.000	0.000	33	16.84	0.000	0.000	55	246.99	10.101	44.945	77	3621.48	0.000	100.000
12	1.30	0.000	0.000	34	19.03	0.000	0.000	56	279.04	9.968	54.913	78	4091.83	0.000	100.000
13	1.47	0.000	0.000	35	21.50	0.000	0.000	57	315.27	9.420	64.333	79	4622.81	0.000	100.000
14	1.66	0.000	0.000	36	24.29	0.000	0.000	58	356.20	8.554	72.887	80	5222.96	0.000	100.000
15	1.87	0.000	0.000	37	27.45	0.000	0.000	59	402.44	7.467	80.354	81	5901.02	0.000	100.000
16	2.11	0.000	0.000	38	31.01	0.000	0.000	60	454.69	6.247	86.602	82	6667.10	0.000	100.000
17	2.39	0.000	0.000	39	35.03	0.000	0.000	61	513.71	4.973	91.574	83	7532.65	0.000	100.000
18	2.70	0.000	0.000	40	39.58	0.000	0.000	62	580.41	3.710	95.284	84	8510.96	0.000	100.000
19	3.05	0.000	0.000	41	44.72	0.000	0.000	63	655.76	2.518	97.802	85	9615.42	0.000	100.000
20	3.45	0.000	0.000	42	50.53	0.000	0.000	64	740.89	1.459	99.261	86	10863.72	0.000	100.000
21	3.89	0.000	0.000	43	57.09	0.000	0.000	65	837.07	0.618	99.879				
22	4.40	0.000	0.000	44	64.50	0.000	0.000	66	945.74	0.121	100.000				

**Lampiran IV.** Hasil Pembacaan Zeta Potensial Menggunakan *Particle Size Analyzer* Pada Formula Nanopartikel PVA 1%

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**SZ-100**

2017.01.26 13:41:30

HORIBA SZ-100 for Windows [Z Type] Ver2.00

## Measurement Results

Zeta Etil Ascorbic 1 % R1.nzt

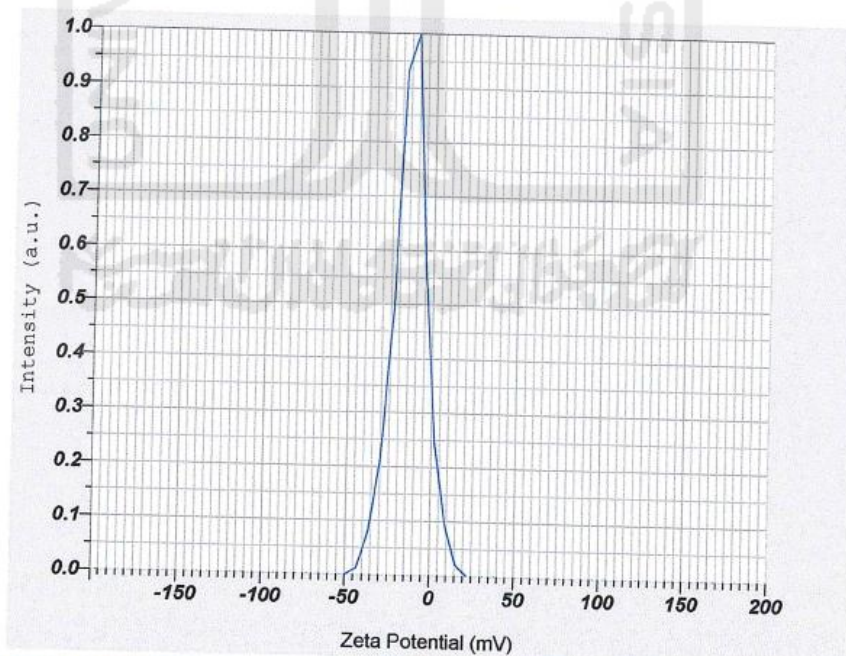
### Measurement Results

Date : Thursday, January 26, 2017 1:35:26 PM  
 Measurement Type : Zeta Potential  
 Sample Name : Etil Ascorbic 1%  
 Temperature of the Holder : 25.0 deg. C  
 Dispersion Medium Viscosity : 0.896 mPa.s  
 Conductivity : 0.085 mS/cm  
 Electrode Voltage : 3.8 V

### Calculation Results

Peak No.	Zeta Potential	Electrophoretic Mobility
1	-13.3 mV	-0.000103 cm <sup>2</sup> /Vs
2	-- mV	-- cm <sup>2</sup> /Vs
3	-- mV	-- cm <sup>2</sup> /Vs

Zeta Potential (Mean) : -13.3 mV  
 Electrophoretic Mobility Mean : -0.000103 cm<sup>2</sup>/Vs



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**Lampiran V.** Hasil Pembacaan Zeta Potensial Menggunakan *Particle Size Analyzer* Pada Formula Nanopartikel PVA 2,5 %

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**SZ-100**

2017.0 1.26 13:30:49

HORIBA SZ-100 for Windows [Z Type] Ver2.00

### Measurement Results

Zeta Etil Ascorbic 2,5% R1.nzt

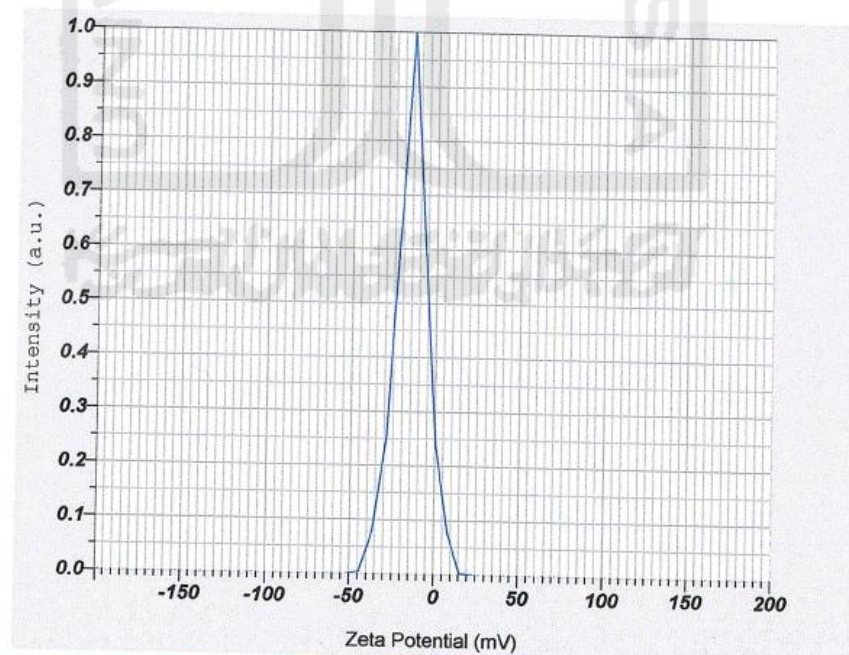
#### Measurement Results

Date : Thursday, January 26, 2017 1:25:33 PM  
 Measurement Type : Zeta Potential  
 Sample Name : Etil Ascorbic 2,5%  
 Temperature of the Holder : 24.9 deg. C  
 Dispersion Medium Viscosity : 0.897 mPa.s  
 Conductivity : 0.148 mS/cm  
 Electrode Voltage : 3.4 V

#### Calculation Results

Peak No.	Zeta Potential	Electrophoretic Mobility
1	-14.4 mV	-0.000111 cm <sup>2</sup> /Vs
2	--- mV	--- cm <sup>2</sup> /Vs
3	--- mV	--- cm <sup>2</sup> /Vs

Zeta Potential (Mean) : -14.4 mV  
 Electrophoretic Mobility Mean : -0.000111 cm<sup>2</sup>/Vs



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**Lampiran VI.** Hasil Pembacaan Zeta Potensial Menggunakan *Particle Size Analyzer* Pada Formula Nanopartikel PVA 5%

2017.01.26 13:49:45

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Scientific

HORIBA SZ-100 for Windows [Z Type] Ver2.00

**SZ-100**

## Measurement Results

### Zeta Etil Ascorbic 5% R1.nzt

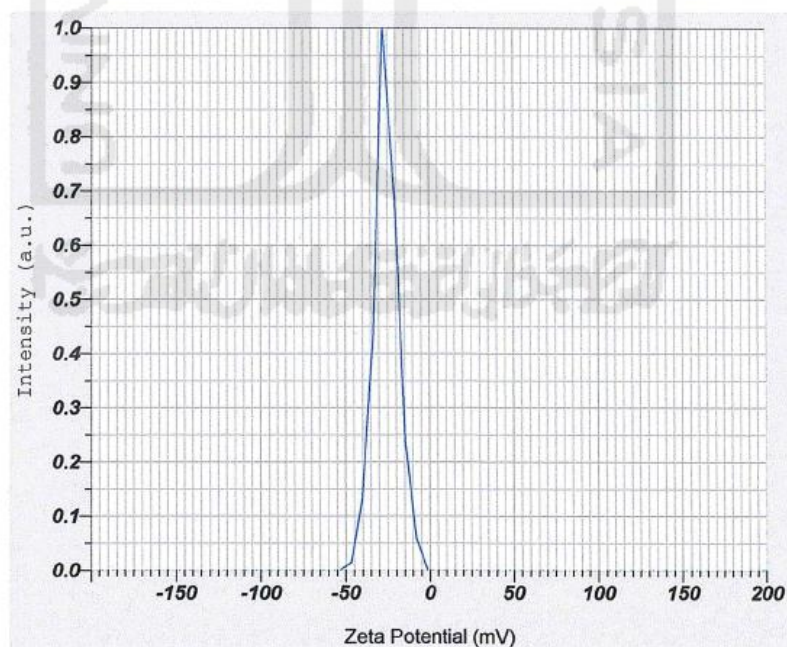
#### Measurement Results

Date : Thursday, January 26, 2017 1:49:13 PM  
 Measurement Type : Zeta Potential  
 Sample Name : Etil Ascorbic 5%  
 Temperature of the Holder : 24.9 deg. C  
 Dispersion Medium Viscosity : 0.897 mPa.s  
 Conductivity : 0.075 mS/cm  
 Electrode Voltage : 3.9 V

#### Calculation Results

Peak No.	Zeta Potential	Electrophoretic Mobility
1	-25.8 mV	-0.000200 cm <sup>2</sup> /Vs
2	-- mV	-- cm <sup>2</sup> /Vs
3	-- mV	-- cm <sup>2</sup> /Vs

Zeta Potential (Mean) : -25.8 mV  
 Electrophoretic Mobility Mean : -0.000200 cm<sup>2</sup>/Vs



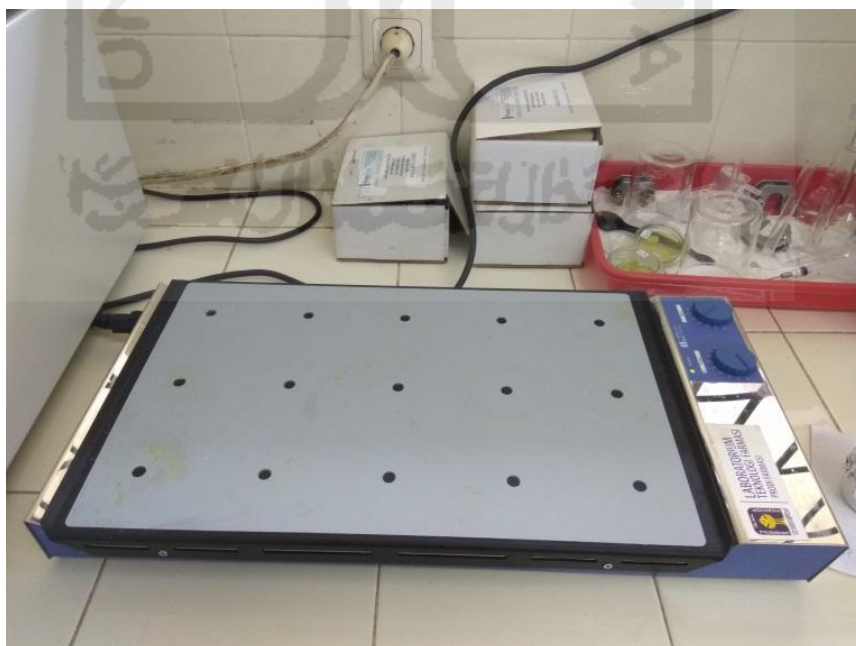
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**Lampiran VII. Alat dan Instrumen Yang Digunakan**

Ultrasonic



Magnetic Stirrer



Timbangan Analitik

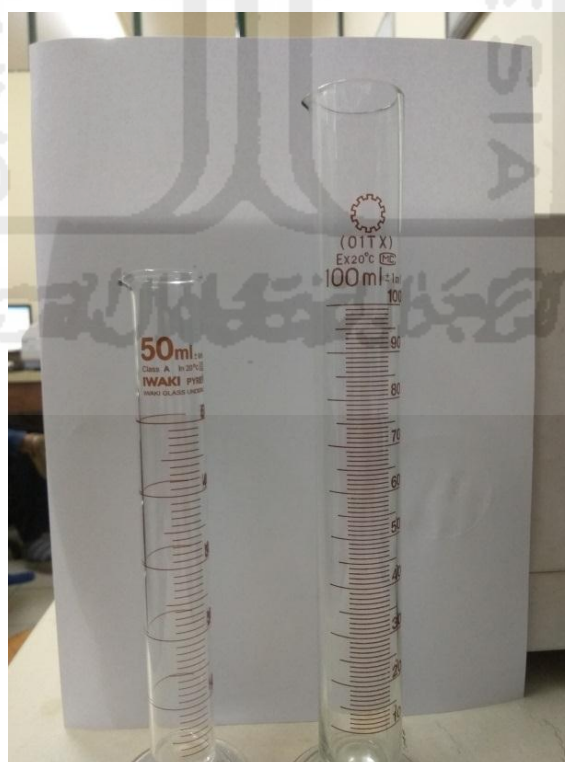


*Particle Size Analyzer (PSA)*





Gelas Beker



Gelas Ukur