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Lampiran

Dokumentasi Kegiatan



Pencampuran semua bahan



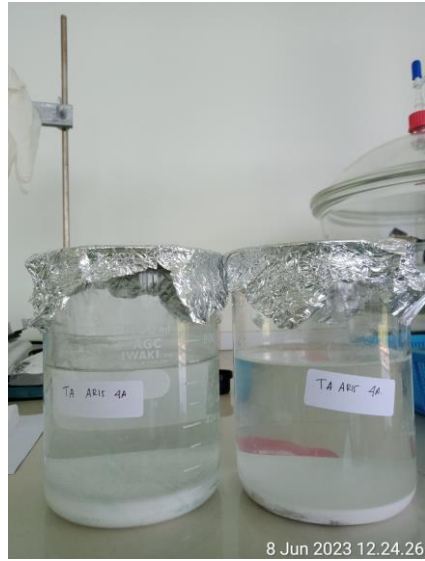
Penambahan NH_4OH



pH awal larutan



pH setelah ditambahkan NH_4OH



Proses Pengadukan



Setelah didiamkan 24 jam



Kalsinasi suhu 400°C

Nano ZnO setelah kalsinasi



Pencampuran dengan AgNO_3



Kalsinasi setelah penambahan Ag



Aplikasi Fotokatalis



Setelah penyinaran dengan penambahan fotokatalis



Setelah penyinaran tanpa fotokatalis



Pengujian COD

Perhitungan :

1. Pembuatan Larutan Zn(NO₃)₂.6H₂O 0,2M dalam 100ml.

Diketahui : Mr Zn(NO₃)₂.6H₂O = 297,49 g/mol

$$[\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}] = 0,2 \text{ M}$$

Ditanya : m...? V=100ml

Jawab :

$$M = \frac{m}{Mr} \times \frac{1000}{ml}$$

$$0,2 \text{ M} = \frac{m}{297,49 \text{ g/mol}} \times \frac{1000}{100 \text{ ml}}$$

$$59,498 = 10m$$

$$m = 5,9498 \text{ gram}$$

2. Pembuatan Larutan PVA:Sukrosa (1:10)

➤ PVA 1% dalam 100 ml

$$1\% = \frac{m}{100 \text{ ml}} \times 100\%$$

$$m = 1 \text{ gram}$$

➤ Sukrosa 10% dalam 50 ml

$$10\% = \frac{m}{50 \text{ ml}} \times 100\%$$

$$m = 5 \text{ gram}$$

3. Pembuatan Larutan AgNO₃

Diketahui : Mr AgNO₃ = 169,87 g/mol

$$M \text{ AgNO}_3 = 0,25\text{M}$$

Ditanya : m...? V=100 ml

$$\text{Jawab : } M = \frac{m}{Mr} \times \frac{1000}{ml}$$

$$0,25 \text{ M} = \frac{m}{169,87 \text{ g/mol}} \times \frac{1000}{100 \text{ ml}}$$

$$m = 4,24 \text{ gram}$$

4. Persen (%) rendemen

Rendemen dihitung berdasarkan AOAC (1999) dalam Aristiyanti (2017) yang dirumuskan sebagai berikut :

$$\text{Rendemen (\% b/b)} = \frac{\text{Berat Produk yang dihasilkan}}{\text{Berat bahan baku}} \times 100\%$$

➤ Rendemen Prekursor ZnO

$$\text{Rendemen (\% b/b)} = \frac{\text{Berat Produk yang dihasilkan}}{\text{Berat bahan baku}} \times 100\%$$

$$= \frac{1,2417}{5,94} \times 100\%$$

$$= 20,90\%$$

➤ Rendemen Nano ZnO-Ag

No.	Sampel	Massa Bahan Awal (gram)	Massa Produk Akhir (gram)	%rendemen
1	A (400)	5	4.51	90.2
2	B (500)	5	4.58	91.6
3	C (600)	5	4.74	94.8

5. Ukuran Partikel dan kandungan unsur Sampel Analisis *Scanning Electron Microscopy Energy Dispersive X-ray*

Pengukuran partikel Nano ZnO-Ag dilakukan menggunakan aplikasi *ImageJ* dan *OriginLab*. Berikut adalah hasil pengukuran menggunakan *ImageJ*

➤ Pengukuran Partikel Nano ZnO

No.	Area	Mean	StdDev	Min	Max	Circ.	%Area	AR	Round	Solidity	r^2	r	d
1	0.033	255	0	255	255	0.83	100	1.434	0.698	0.889	0.00263	0.05126	0.10252
2	0.128	255	0	255	255	0.719	100	1.849	0.541	0.878	0.01019	0.10095	0.2019
3	0.026	255	0	255	255	0.829	100	1.819	0.55	0.881	0.00207	0.0455	0.091
4	8.336	243.585	52.733	0	255	0.028	95.523	2.469	0.405	0.262	0.66369	0.81467	1.62935
5	0.038	255	0	255	255	0.424	100	4.251	0.235	0.833	0.00303	0.055	0.11001
6	0.007	255	0	255	255	0.967	100	1.579	0.633	0.889	0.00056	0.02361	0.04722
7	0.016	255	0	255	255	0.829	100	2.09	0.479	0.841	0.00127	0.03569	0.07138
8	0.034	255	0	255	255	0.951	100	1.198	0.835	0.879	0.00271	0.05203	0.10406
9	0.094	255	0	255	255	0.891	100	1.561	0.64	0.932	0.00748	0.08651	0.17302
10	0.086	255	0	255	255	0.629	100	2.102	0.476	0.81	0.00685	0.08275	0.16549
11	0.029	255	0	255	255	0.762	100	2.026	0.494	0.891	0.00231	0.04805	0.0961
12	3.624	249.764	36.164	0	255	0.065	97.947	1.188	0.842	0.386	0.28854	0.53715	1.07431
13	0.002	255	0	255	255	0.809	100	3	0.333	1	0.00016	0.01262	0.02524
14	0.015	255	0	255	255	0.857	100	1.699	0.589	0.885	0.00119	0.03456	0.06912
15	0.602	255	0	255	255	0.448	100	1.257	0.795	0.746	0.04793	0.21893	0.43786
16	0.014	255	0	255	255	0.896	100	1.808	0.553	0.877	0.00111	0.03339	0.06677
17	0.096	255	0	255	255	0.41	100	2.488	0.402	0.635	0.00764	0.08743	0.17485
18	0.03	255	0	255	255	0.894	100	1.339	0.747	0.9	0.00239	0.04887	0.09775
19	0.395	255	0	255	255	0.231	100	1.673	0.598	0.513	0.03145	0.17734	0.35468
20	0.005	255	0	255	255	1	100	1.559	0.641	0.909	0.0004	0.01995	0.0399
21	0.01	255	0	255	255	0.996	100	1.372	0.729	0.947	0.0008	0.02822	0.05643

No.	Area	Mean	StdDev	Min	Max	Circ.	%Area	AR	Round	Solidity	r^2	r	d
22	0.247	247.65	42.712	0	255	0.536	97.118	1.472	0.679	0.742	0.01967	0.14023	0.28047
23	0.013	255	0	255	255	0.916	100	1.23	0.813	0.828	0.00104	0.03217	0.06434
24	0.14	255	0	255	255	0.691	100	1.592	0.628	0.84	0.01115	0.10558	0.21115
25	0.025	255	0	255	255	0.907	100	1.79	0.559	0.9	0.00199	0.04461	0.08923
26	0.087	255	0	255	255	0.672	100	1.632	0.613	0.876	0.00693	0.08323	0.16645
27	0.03	255	0	255	255	0.858	100	1.508	0.663	0.873	0.00239	0.04887	0.09775
28	0.025	255	0	255	255	0.907	100	1.398	0.715	0.891	0.00199	0.04461	0.08923
29	0.055	255	0	255	255	0.703	100	1.761	0.568	0.823	0.00438	0.06617	0.13235
30	0.538	250.595	33.243	0	255	0.326	98.272	3.905	0.256	0.763	0.04283	0.20696	0.41393
31	0.005	255	0	255	255	0.923	100	1.539	0.65	0.9	0.0004	0.01995	0.0399
32	1.646	241.945	56.211	0	255	0.233	94.88	3.67	0.272	0.68	0.13105	0.36201	0.72402
33	0.031	255	0	255	255	0.839	100	1.962	0.51	0.884	0.00247	0.04968	0.09936
34	0.277	255	0	255	255	0.576	100	1.862	0.537	0.793	0.02205	0.14851	0.29701
35	5.47E-04	255	0	255	255	1	100	1	1	1	4.36E-05	0.0066	0.0132
36	0.008	255	0	255	255	0.869	100	1.914	0.522	0.833	0.00064	0.02524	0.05048
37	0.025	255	0	255	255	0.99	100	1.083	0.924	0.968	0.00199	0.04461	0.08923
38	2.05	250.507	33.553	0	255	0.114	98.238	3.875	0.258	0.454	0.16322	0.404	0.808
39	0.03	255	0	255	255	0.749	100	1.801	0.555	0.809	0.00239	0.04887	0.09775
40	0.718	255	0	255	255	0.23	100	4.186	0.239	0.586	0.05717	0.23909	0.47819
41	0.049	255	0	255	255	0.485	100	2.284	0.438	0.738	0.0039	0.06246	0.12492
42	0.002	255	0	255	255	1	100	1.464	0.683	0.857	0.00016	0.01262	0.02524
43	0.004	255	0	255	255	0.567	100	3.665	0.273	0.727	0.00032	0.01785	0.03569

No.	Area	Mean	StdDev	Min	Max	Circ.	%Area	AR	Round	Solidity	r^2	r	d
44	0.044	255	0	255	255	0.784	100	1.626	0.615	0.848	0.0035	0.05919	0.11838
45	0.016	255	0	255	255	0.769	100	1.686	0.593	0.845	0.00127	0.03569	0.07138
46	0.089	255	0	255	255	0.494	100	1.871	0.535	0.731	0.00709	0.08418	0.16836
47	0.015	255	0	255	255	0.553	100	3.714	0.269	0.747	0.00119	0.03456	0.06912
48	0.003	255	0	255	255	1	100	1.291	0.775	0.8	0.00024	0.01545	0.03091
49	0.144	255	0	255	255	0.762	100	1.453	0.688	0.893	0.01146	0.10707	0.21415
50	0.01	255	0	255	255	0.965	100	1.768	0.566	0.857	0.0008	0.02822	0.05643
51	0.183	255	0	255	255	0.562	100	2.954	0.338	0.819	0.01457	0.12071	0.24141
52	0.03	255	0	255	255	0.649	100	1.785	0.56	0.78	0.00239	0.04887	0.09775
53	0.016	255	0	255	255	0.714	100	1.84	0.543	0.8	0.00127	0.03569	0.07138
54	0.036	255	0	255	255	0.58	100	3.478	0.288	0.852	0.00287	0.05354	0.10707
55	0.005	255	0	255	255	0.776	100	1.624	0.616	0.714	0.0004	0.01995	0.0399
56	0.003	255	0	255	255	1	100	1.553	0.644	0.909	0.00024	0.01545	0.03091
57	0.074	255	0	255	255	0.756	100	1.838	0.544	0.828	0.00589	0.07676	0.15352
58	0.011	255	0	255	255	0.629	100	2.366	0.423	0.808	0.00088	0.02959	0.05919
59	0.025	255	0	255	255	0.83	100	2.13	0.47	0.893	0.00199	0.04461	0.08923
60	0.03	255	0	255	255	0.975	100	1.235	0.81	0.893	0.00239	0.04887	0.09775
61	0.003	255	0	255	255	0.873	100	2.308	0.433	0.769	0.00024	0.01545	0.03091
62	0.07	255	0	255	255	0.829	100	1.338	0.748	0.898	0.00557	0.07465	0.14931
63	0.047	255	0	255	255	0.914	100	1.249	0.801	0.915	0.00374	0.06117	0.12234
64	0.003	255	0	255	255	0.873	100	2.308	0.433	0.769	0.00024	0.01545	0.03091
65	0.056	255	0	255	255	0.679	100	2.033	0.492	0.854	0.00446	0.06677	0.13355
66	0.274	255	0	255	255	0.835	100	1.085	0.922	0.916	0.02182	0.1477	0.2954

No.	Area	Mean	StdDev	Min	Max	Circ.	%Area	AR	Round	Solidity	r^2	r	d
67	0.032	255	0	255	255	0.31	100	4.788	0.209	0.638	0.00255	0.05048	0.10095
68	0.045	255	0	255	255	0.803	100	1.709	0.585	0.874	0.00358	0.05986	0.11971
69	0.026	255	0	255	255	0.794	100	2.065	0.484	0.897	0.00207	0.0455	0.091
70	0.015	255	0	255	255	0.887	100	1.589	0.629	0.844	0.00119	0.03456	0.06912
71	0.013	255	0	255	255	0.743	100	2.318	0.431	0.873	0.00104	0.03217	0.06434
72	0.043	255	0	255	255	0.63	100	1.977	0.506	0.778	0.00342	0.05851	0.11702
73	0.069	255	0	255	255	0.566	100	2.06	0.485	0.779	0.00549	0.07412	0.14824
74	0.145	255	0	255	255	0.572	100	1.693	0.591	0.818	0.01154	0.10745	0.21489
75	0.038	255	0	255	255	0.839	100	1.914	0.522	0.932	0.00303	0.055	0.11001
76	0.027	255	0	255	255	0.665	100	2.789	0.359	0.893	0.00215	0.04636	0.09273

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No.	Area	Mean	StdDev	Min	Max	Circ.	%Area	AR	Round	Solidity	r ²	r	d
1	0.022	255	0	255	255	0.76	100	1.7	0.58	0.854	0.00175	0.04185	0.0837
2	0.008	255	0	255	255	1	100	1.6	0.638	0.914	0.00064	0.02524	0.05048
3	0.008	255	0	255	255	0.985	100	1.6	0.62	0.85	0.00064	0.02524	0.05048
4	0.003	255	0	255	255	1	100	1.1	0.936	0.875	0.00024	0.01545	0.03091
5	0.056	255	0	255	255	0.796	100	1.4	0.733	0.875	0.00446	0.06677	0.13355
6	0.022	255	0	255	255	0.907	100	1.3	0.774	0.865	0.00175	0.04185	0.0837
7	0.032	255	0	255	255	0.796	100	2.1	0.471	0.878	0.00255	0.05048	0.10095
8	0.049	255	0	255	255	0.776	100	1.6	0.607	0.843	0.0039	0.06246	0.12492
9	0.068	255	0	255	255	0.733	100	1.9	0.513	0.875	0.00541	0.07358	0.14716
10	0.008	255	0	255	255	1	100	1.6	0.638	0.914	0.00064	0.02524	0.05048
11	0.02	255	0	255	255	0.826	100	1.8	0.55	0.872	0.00159	0.0399	0.07981
12	0.009	255	0	255	255	1	100	1.3	0.785	0.974	0.00072	0.02677	0.05354
13	0.009	255	0	255	255	0.965	100	1.4	0.695	0.857	0.00072	0.02677	0.05354
14	0.016	255	0	255	255	0.965	100	1.6	0.64	0.917	0.00127	0.03569	0.07138
15	0.058	255	0	255	255	0.846	100	1.3	0.773	0.886	0.00462	0.06795	0.13591
16	2.91	252.3	26.09	0	255	0.05	98.94	1.9	0.54	0.455	0.23169	0.48134	0.96268
17	0.021	255	0	255	255	0.954	100	1.6	0.637	0.869	0.00167	0.04089	0.08178
18	0.286	255	0	255	255	0.751	100	1.6	0.617	0.898	0.02277	0.1509	0.3018
19	0.003	255	0	255	255	1	100	1.6	0.626	0.875	0.00024	0.01545	0.03091
20	0.12	255	0	255	255	0.707	100	1.7	0.59	0.842	0.00955	0.09775	0.19549
21	0.083	255	0	255	255	0.465	100	3	0.331	0.752	0.00661	0.08129	0.16258

No.	Area	Mean	StdDev	Min	Max	Circ.	%Area	AR	Round	Solidity	r^2	r	d
22	0.007	255	0	255	255	1	100	1.1	0.88	0.968	0.00056	0.02361	0.04722
23	0.001	255	0	255	255	1	100	1.5	0.683	0.857	7.96E-05	0.00892	0.01785
24	0.424	255	0	255	255	0.641	100	1.8	0.558	0.874	0.03376	0.18373	0.36747
25	0.021	255	0	255	255	0.808	100	1.9	0.522	0.866	0.00167	0.04089	0.08178
26	0.062	255	0	255	255	0.482	100	2.1	0.472	0.687	0.00494	0.07026	0.14052
27	0.01	255	0	255	255	0.698	100	2.7	0.37	0.8	0.0008	0.02822	0.05643
28	1.047	255	0	255	255	0.23	100	1.4	0.705	0.659	0.08336	0.28872	0.57744
29	0.008	255	0	255	255	0.985	100	1	0.957	0.85	0.00064	0.02524	0.05048
30	0.718	255	0	255	255	0.243	100	1.5	0.659	0.521	0.05717	0.23909	0.47819
31	0.006	255	0	255	255	1	100	1.7	0.606	0.889	0.00048	0.02186	0.04371
32	0.003	255	0	255	255	1	100	1.9	0.517	0.933	0.00024	0.01545	0.03091
33	0.489	255	0	255	255	0.459	100	2.6	0.386	0.779	0.03893	0.19731	0.39463
34	0.002	255	0	255	255	1	100	1.6	0.644	0.909	0.00016	0.01262	0.02524
35	0.031	255	0	255	255	0.771	100	2	0.512	0.886	0.00247	0.04968	0.09936
36	0.001	255	0	255	255	1	100	1.5	0.683	0.857	7.96E-05	0.00892	0.01785
37	0.378	255	0	255	255	0.473	100	2.7	0.368	0.776	0.0301	0.17348	0.34696
38	0.192	255	0	255	255	0.342	100	4.9	0.205	0.766	0.01529	0.12364	0.24728
39	0.235	255	0	255	255	0.628	100	1.8	0.565	0.819	0.01871	0.13679	0.27357
40	2.424	250.8	32.58	0	255	0.257	98.34	1.8	0.571	0.656	0.19299	0.43931	0.87862
41	0.085	255	0	255	255	0.796	100	1.5	0.658	0.879	0.00677	0.08226	0.16453
42	3.418	250	35.49	0	255	0.117	98.02	1.9	0.534	0.535	0.27213	0.52166	1.04333

No.	Area	Mean	StdDev	Min	Max	Circ.	%Area	AR	Round	Solidity	r^2	r	d
43	0.025	255	0	255	255	0.919	100	1.4	0.734	0.909	0.00199	0.04461	0.08923
44	0.014	255	0	255	255	0.784	100	2.3	0.427	0.853	0.00111	0.03339	0.06677
45	0.644	244.6	50.5	0	255	0.537	95.91	1.9	0.516	0.828	0.05127	0.22644	0.45287
46	0.017	255	0	255	255	0.555	100	3.4	0.296	0.833	0.00135	0.03679	0.07358
47	0.022	255	0	255	255	0.949	100	1.3	0.768	0.907	0.00175	0.04185	0.0837
48	1.272	255	0	255	255	0.348	100	2.8	0.358	0.683	0.10127	0.31824	0.63647
49	0.064	255	0	255	255	0.829	100	1.7	0.573	0.901	0.0051	0.07138	0.14277
50	0.002	255	0	255	255	1	100	1	1	1	0.00016	0.01262	0.02524
51	0.002	255	0	255	255	0.857	100	2	0.5	0.8	0.00016	0.01262	0.02524
52	0.085	255	0	255	255	0.338	100	5.3	0.189	0.683	0.00677	0.08226	0.16453
53	0.07	255	0	255	255	0.897	100	1.3	0.771	0.924	0.00557	0.07465	0.14931
54	0.006	255	0	255	255	0.967	100	1.6	0.633	0.889	0.00048	0.02186	0.04371
55	0.277	255	0	255	255	0.502	100	1.7	0.602	0.719	0.02205	0.14851	0.29701
56	0.004	255	0	255	255	1	100	1.2	0.814	0.941	0.00032	0.01785	0.03569
57	0.081	255	0	255	255	0.771	100	2	0.496	0.924	0.00645	0.08031	0.16061
58	0.002	255	0	255	255	0.698	100	2.7	0.377	0.667	0.00016	0.01262	0.02524
59	0.018	255	0	255	255	0.76	100	2.2	0.454	0.881	0.00143	0.03786	0.07571
60	0.165	255	0	255	255	0.397	100	2.4	0.414	0.68	0.01314	0.11462	0.22923
61	0.403	255	0	255	255	0.447	100	2.8	0.356	0.788	0.03209	0.17913	0.35825
62	0.018	255	0	255	255	1	100	1.1	0.922	0.892	0.00143	0.03786	0.07571
63	0.012	255	0	255	255	0.916	100	1.1	0.9	0.828	0.00096	0.03091	0.06182
64	0.014	255	0	255	255	0.977	100	1.4	0.699	0.921	0.00111	0.03339	0.06677
65	0.01	255	0	255	255	0.815	100	1.8	0.552	0.784	0.0008	0.02822	0.05643

No.	Area	Mean	StdDev	Min	Max	Circ.	%Area	AR	Round	Solidity	r^2	r	d
66	0.084	255	0	255	255	0.916	100	1.1	0.94	0.924	0.00669	0.08178	0.16356
67	0.003	255	0	255	255	0.916	100	1.6	0.628	0.857	0.00024	0.01545	0.03091
68	0.371	255	0	255	255	0.327	100	1.6	0.631	0.587	0.02954	0.17187	0.34373
69	1.328	254.9	4.93	0	255	0.188	99.96	2.3	0.437	0.609	0.10573	0.32517	0.65033
70	0.013	255	0	255	255	0.854	100	1.4	0.709	0.812	0.00104	0.03217	0.06434
71	0.031	255	0	255	255	0.877	100	1.6	0.635	0.867	0.00247	0.04968	0.09936
72	0.007	255	0	255	255	0.675	100	3.1	0.323	0.8	0.00056	0.02361	0.04722
73	0.004	255	0	255	255	1	100	1.2	0.814	0.941	0.00032	0.01785	0.03569
74	0.032	255	0	255	255	0.942	100	1.3	0.764	0.901	0.00255	0.05048	0.10095
75	0.02	255	0	255	255	0.679	100	1.7	0.573	0.796	0.00159	0.0399	0.07981
76	0.549	255	0	255	255	0.321	100	2.3	0.445	0.701	0.04371	0.20907	0.41814
77	0.026	255	0	255	255	0.736	100	2.3	0.428	0.852	0.00207	0.0455	0.091
78	0.005	255	0	255	255	0.887	100	1.9	0.528	0.88	0.0004	0.01995	0.0399
79	0.011	255	0	255	255	0.878	100	1.6	0.638	0.836	0.00088	0.02959	0.05919
80	4.97E-04	255	0	255	255	1	100	1	1	1	3.95E-05	0.00629	0.01258

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No.	Area	Mean	StdDev	Min	Max	Circ.	%Area	AR	Round	Solidity	r^2	r	d
1	0.028	255	0	255	255	0.952	100	1.23	0.813	0.936	0.00223	0.04722	0.09443
2	0.018	255	0	255	255	0.925	100	1.463	0.684	0.941	0.00143	0.03786	0.07571
3	0.095	255	0	255	255	0.349	100	2.042	0.49	0.636	0.00756	0.08697	0.17394
4	0.017	255	0	255	255	1	100	1.154	0.866	0.931	0.00135	0.03679	0.07358
5	0.042	255	0	255	255	0.525	100	2.338	0.428	0.802	0.00334	0.05783	0.11565
6	0.02	255	0	255	255	0.99	100	1.169	0.855	0.928	0.00159	0.0399	0.07981
7	2.24E-04	255	0	255	255	1	100	1	1	1	1.78E-05	0.00422	0.00844
8	0.018	255	0	255	255	0.717	100	1.897	0.527	0.888	0.00143	0.03786	0.07571
9	0.012	255	0	255	255	1	100	1.282	0.78	0.937	0.00096	0.03091	0.06182
10	0.108	255	0	255	255	0.516	100	2.43	0.411	0.824	0.0086	0.09273	0.18546
11	0.171	255	0	255	255	0.688	100	1.525	0.656	0.9	0.01361	0.11668	0.23336
12	0.009	255	0	255	255	0.888	100	1.436	0.697	0.848	0.00072	0.02677	0.05354
13	0.001	255	0	255	255	0.809	100	1.809	0.553	0.857	7.96E-05	0.00892	0.01785
14	0.006	255	0	255	255	0.836	100	1.89	0.529	0.844	0.00048	0.02186	0.04371
15	0.025	255	0	255	255	0.533	100	3.701	0.27	0.81	0.00199	0.04461	0.08923
16	0.033	255	0	255	255	0.589	100	2.693	0.371	0.775	0.00263	0.05126	0.10252
17	0.063	255	0	255	255	0.752	100	1.439	0.695	0.879	0.00502	0.07082	0.14165
18	2.24E-04	255	0	255	255	1	100	1	1	1	1.78E-05	0.00422	0.00844
19	0.158	255	0	255	255	0.548	100	1.351	0.74	0.78	0.01258	0.11216	0.22432
20	0.219	255	0	255	255	0.673	100	1.171	0.854	0.854	0.01744	0.13205	0.26409
21	2.24E-04	255	0	255	255	1	100	1	1	1	1.78E-05	0.00422	0.00844

No.	Area	Mean	StdDev	Min	Max	Circ.	%Area	AR	Round	Solidity	r^2	r	d
22	0.018	255	0	255	255	0.934	100	1.262	0.793	0.901	0.00143	0.03786	0.07571
23	0.738	252.8	23.41	0	255	0.342	99.15	2.526	0.396	0.669	0.05876	0.2424	0.4848
24	0.006	255	0	255	255	0.967	100	1.695	0.59	0.915	0.00048	0.02186	0.04371
25	0.001	255	0	255	255	1	100	1.553	0.644	0.909	7.96E-05	0.00892	0.01785
26	0.009	255	0	255	255	0.603	100	3.33	0.3	0.854	0.00072	0.02677	0.05354
27	0.109	255	0	255	255	0.518	100	3.682	0.272	0.822	0.00868	0.09316	0.18632
28	0.132	255	0	255	255	0.778	100	1.748	0.572	0.922	0.01051	0.10252	0.20503
29	0.013	255	0	255	255	0.804	100	1.696	0.59	0.896	0.00104	0.03217	0.06434
30	0.122	255	0	255	255	0.762	100	1.474	0.679	0.896	0.00971	0.09856	0.19711
31	0.047	255	0	255	255	0.726	100	1.695	0.59	0.886	0.00374	0.06117	0.12234
32	0.009	255	0	255	255	0.924	100	1.533	0.652	0.905	0.00072	0.02677	0.05354
33	0.001	255	0	255	255	0.809	100	2.237	0.447	0.857	7.96E-05	0.00892	0.01785
34	0.174	255	0	255	255	0.761	100	1.311	0.763	0.897	0.01385	0.1177	0.2354
35	0.034	255	0	255	255	0.522	100	1.933	0.517	0.807	0.00271	0.05203	0.10406
36	0.007	255	0	255	255	0.585	100	3.25	0.308	0.767	0.00056	0.02361	0.04722
37	0.243	255	0	255	255	0.288	100	4.539	0.22	0.738	0.01935	0.13909	0.27819
38	8.96E-04	255	0	255	255	1	100	2.031	0.492	0.8	7.13E-05	0.00844	0.01689
39	0.002	255	0	255	255	1	100	1.327	0.753	0.909	0.00016	0.01262	0.02524
40	2.24E-04	255	0	255	255	1	100	1	1	1	1.78E-05	0.00422	0.00844

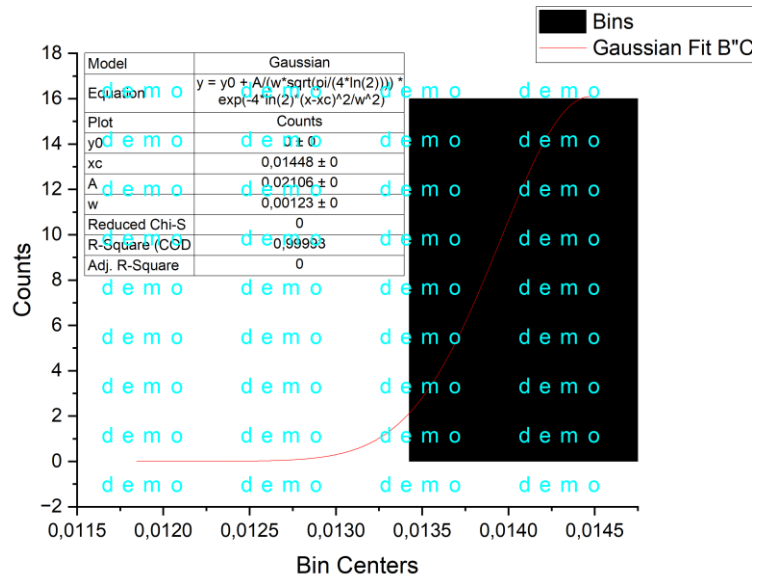
➤ Pengukuran Partikel Nano ZnO-Ag suhu 600°C

No.	Area	Mean	StdDev	Min	Max	Circ.	%Area	AR	Round	Solidity	r^2	r	d
1	0.569	250.53	33.464	0	255	0.541	98.248	1.342	0.745	0.793	0.0453	0.21284	0.42569
2	1.313	255	0	255	255	0.068	100	1.535	0.651	0.352	0.10454	0.32332	0.64665
3	0.641	247.07	44.285	0	255	0.182	96.888	4.681	0.214	0.511	0.05104	0.22591	0.45182
4	0.569	255	0	255	255	0.238	100	2.671	0.374	0.534	0.0453	0.21284	0.42569
5	0.004	255	0	255	255	1	100	1.263	0.792	0.919	0.00032	0.01785	0.03569
6	0.351	255	0	255	255	0.403	100	2.004	0.499	0.697	0.02795	0.16717	0.33434
7	0.003	255	0	255	255	0.883	100	1.61	0.621	0.889	0.00024	0.01545	0.03091
8	7.136	211.55	95.88	0	255	0.059	82.959	1.464	0.683	0.42	0.56815	0.75376	1.50752
9	0.011	255	0	255	255	0.907	100	1.347	0.742	0.874	0.00088	0.02959	0.05919
10	0.339	255	0	255	255	0.445	100	1.59	0.629	0.749	0.02699	0.16429	0.32858
11	0.076	255	0	255	255	0.49	100	2.007	0.498	0.725	0.00605	0.07779	0.15558
12	0.14	255	0	255	255	0.705	100	1.93	0.518	0.881	0.01115	0.10558	0.21115
13	0.041	255	0	255	255	0.315	100	5.807	0.172	0.651	0.00326	0.05713	0.11427
14	0.457	255	0	255	255	0.285	100	1.715	0.583	0.6	0.03639	0.19075	0.3815
15	0.265	255	0	255	255	0.525	100	3.415	0.293	0.815	0.0211	0.14525	0.29051
16	0.076	255	0	255	255	0.509	100	3.257	0.307	0.828	0.00605	0.07779	0.15558
17	0.201	255	0	255	255	0.358	100	1.881	0.532	0.612	0.016	0.1265	0.25301
18	0.048	255	0	255	255	0.482	100	3.936	0.254	0.862	0.00382	0.06182	0.12364
19	1.277	250.22	34.582	0	255	0.078	98.126	1.282	0.78	0.46	0.10167	0.31886	0.63772
20	0.071	255	0	255	255	0.596	100	2.942	0.34	0.881	0.00565	0.07519	0.15037
21	0.005	255	0	255	255	0.922	100	1.57	0.637	0.863	0.0004	0.01995	0.0399

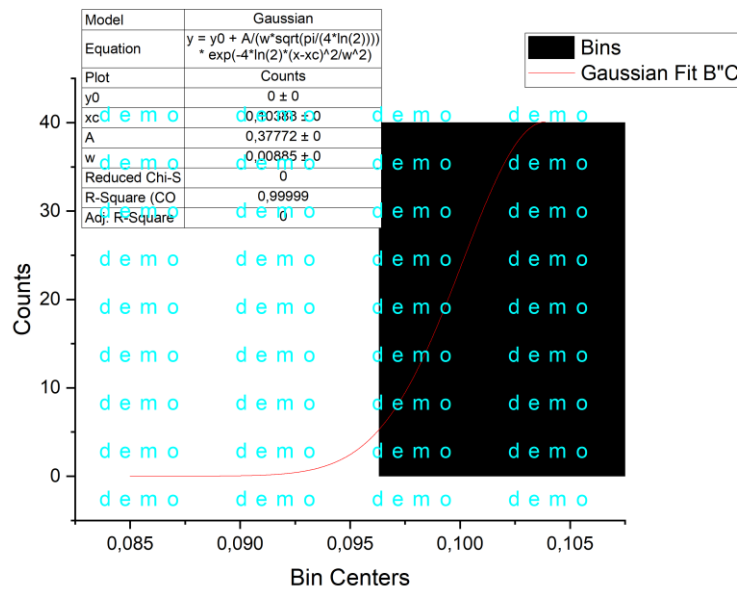
No.	Area	Mean	StdDev	Min	Max	Circ.	%Area	AR	Round	Solidity	r^2	r	d
22	0.71	255	0	255	255	0.224	100	1.207	0.829	0.611	0.05653	0.23776	0.47552
23	0.005	255	0	255	255	0.922	100	1.856	0.539	0.898	0.0004	0.01995	0.0399
24	0.081	255	0	255	255	0.672	100	1.608	0.622	0.832	0.00645	0.08031	0.16061
25	0.004	255	0	255	255	1	100	1.257	0.795	0.857	0.00032	0.01785	0.03569
26	2.49E-04	255	0	255	255	1	100	1	1	1	1.98E-05	0.00446	0.00891
27	0.075	255	0	255	255	0.714	100	1.536	0.651	0.874	0.00597	0.07727	0.15455
28	0.011	255	0	255	255	0.887	100	1.836	0.545	0.898	0.00088	0.02959	0.05919
29	0.086	255	0	255	255	0.849	100	1.539	0.65	0.937	0.00685	0.08275	0.16549
30	0.023	255	0	255	255	0.9	100	1.552	0.644	0.912	0.00183	0.04279	0.08559
31	0.045	255	0	255	255	0.76	100	1.769	0.565	0.888	0.00358	0.05986	0.11971
32	0.001	255	0	255	255	1	100	1.5	0.667	1	7.96E-05	0.00892	0.01785
33	0.03	255	0	255	255	0.664	100	1.728	0.579	0.869	0.00239	0.04887	0.09775

➤ Hasil Pengukuran rata-rata partikel dengan OriginLab

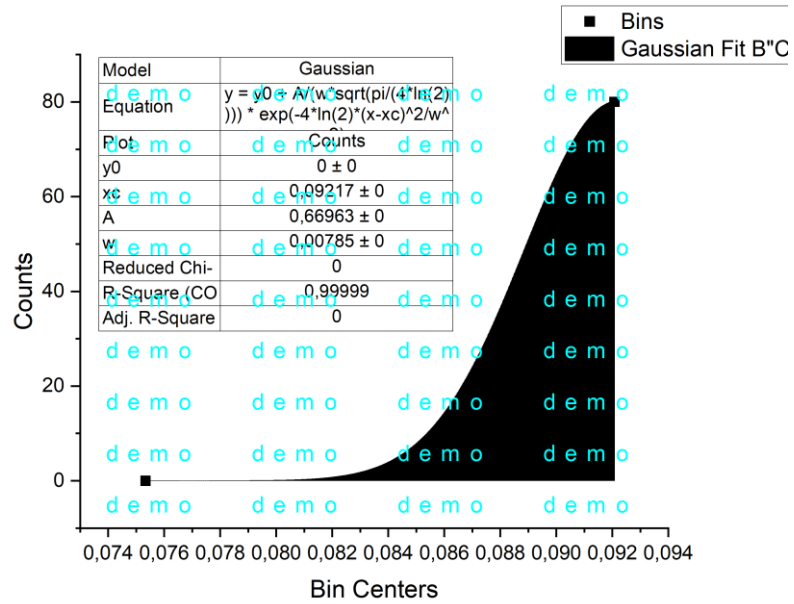
- Nano ZnO



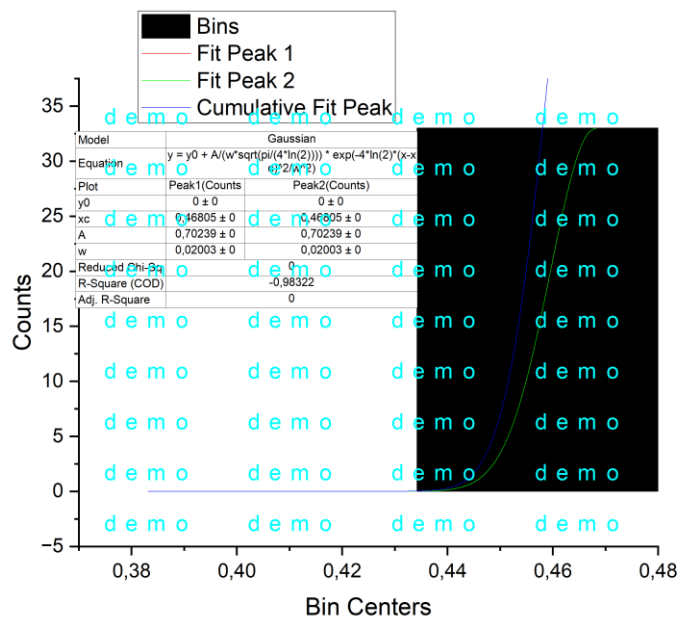
- Nano ZnO-Ag Suhu 400°C



- Nano ZnO-Ag Suhu 500°C



- Nano ZnO-Ag Suhu 600°C

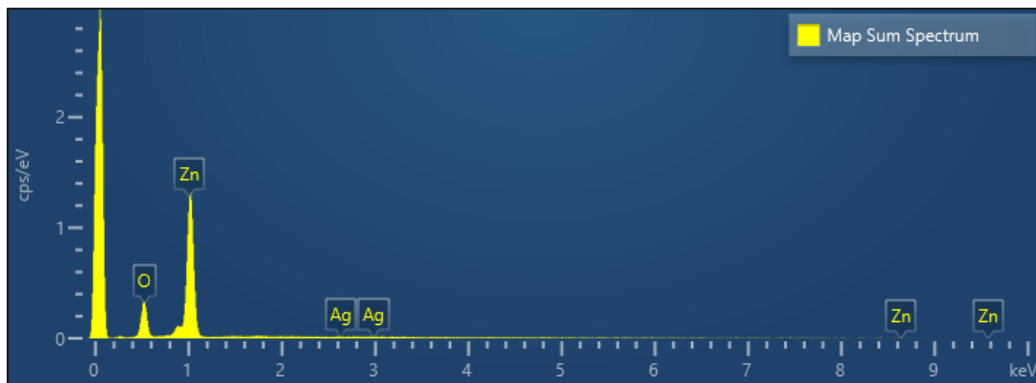


➤ Rekap Hasil Pengukuran rata-rata partikel

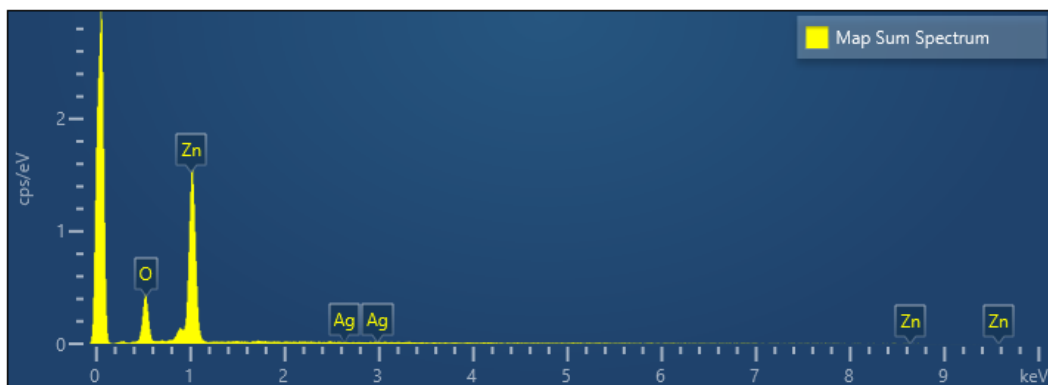
No.	Sampel	Ukuran (μm)	nm
1	Nano ZnO-Ag 400	0.09217 ± 0	92.2
2	Nano ZnO-Ag 500	0.10388 ± 0	104
3	Nano ZnO-Ag 600	0.46805 ± 0	468

➤ Hasil Pengukuran Kandungan Unsur dengan EDX

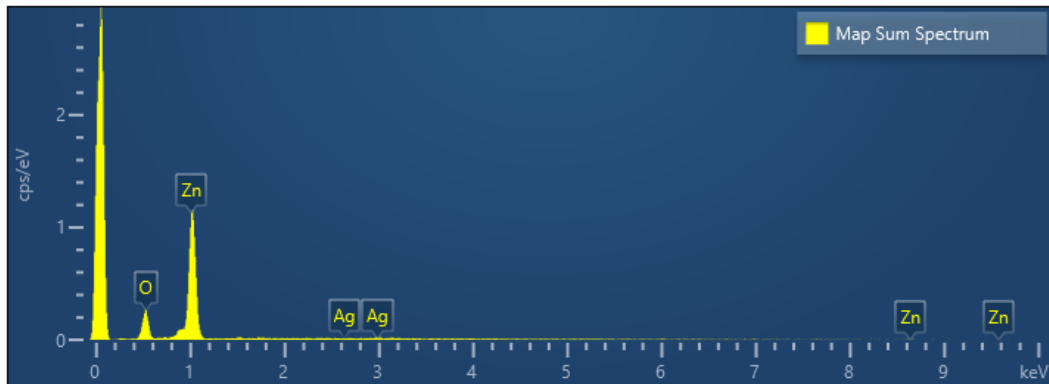
- Nano ZnO-Ag suhu 400°C



- Nano ZnO-Ag suhu 500°C



- Nano ZnO-Ag suhu 600°C



No.	Sampel	Persentase Kandungan (%)		
		Zn	O	Ag
1	Nano ZnO-Ag 400	81.6	18.1	0.27
2	Nano ZnO-Ag 500	80.3	19.4	0.33
3	Nano ZnO-Ag 600	81.39	16.5	2.09

6. Hasil Pengukuran Absorbansi Degradasi Zat Warna

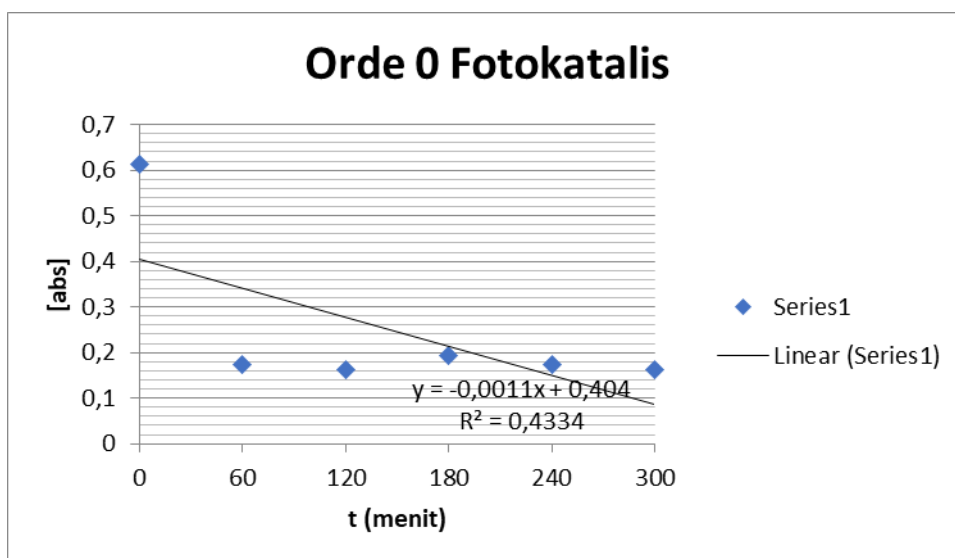
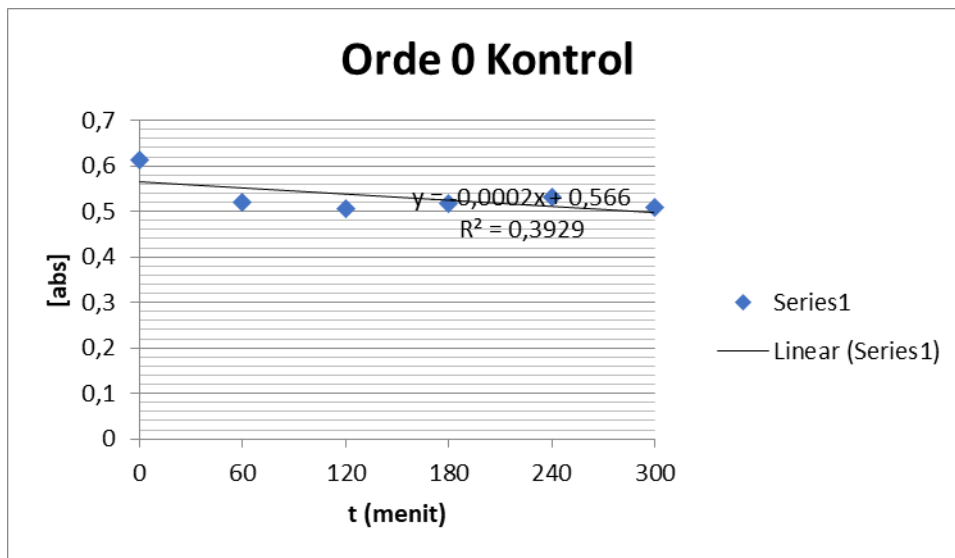
No.	Sampel	Abs	Persen Degradasi ((C0-Ct)/C0)x100
1	Inlet (C0)	0.612	
	Percobaan 1 (Ct)		
1	A-400-1	0.189	69.11764706
2	A-400-2	0.167	72.7124183
3	A-400-3	0.203	66.83006536
4	A-400-4	0.17	72.22222222
5	A-400-5	0.161	73.69281046
	Percobaan 2 (Ct)		
1	B-400-1	0.156	
	B-400-1 (2)	0.156	
2	B-400-2	0.158	
	B-400-2 (2)	0.153	
3	B-400-3	0.199	
	B-400-3 (2)	0.17	
4	B-400-4	0.176	
	B-400-4 (2)	0.175	
5	B-400-5	0.164	
	B-400-5 (2)	0.164	

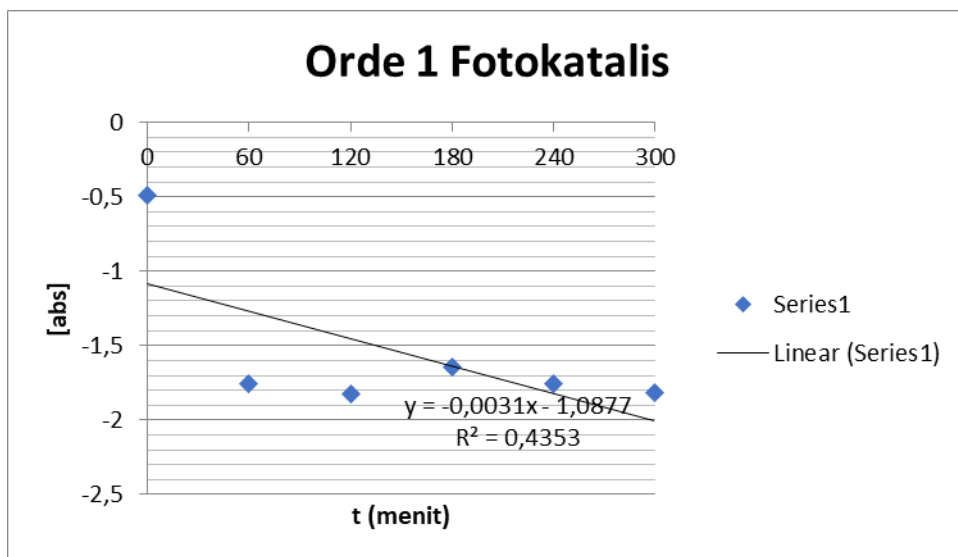
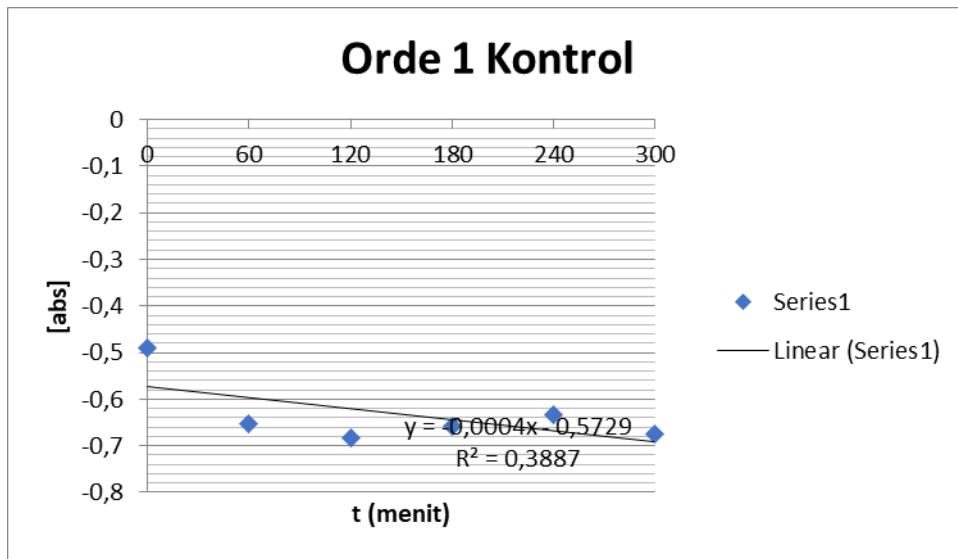
RATA -RATA Percobaan 2 (Ct)			
1	B-400-1	0.156	74.50980392
2	B-400-2	0.1555	74.59150327
3	B-400-3	0.1845	69.85294118
4	B-400-4	0.1755	71.32352941
5	B-400-5	0.164	73.20261438
Rata-Rata 2 Percobaan (A &B) (Ct)			
	AB 1	0.1725	71.81372549
	AB2	0.16125	73.65196078
	AB 3	0.19375	68.34150327
	AB 4	0.17275	71.77287582
	AB 5	0.1625	73.44771242
Kontrol			
12	K-1	0.52	15.03267974
13	K-2	0.505	17.48366013
14	K-3	0.518	15.35947712
15	K-4	0.531	13.23529412
16	K-5	0.509	16.83006536

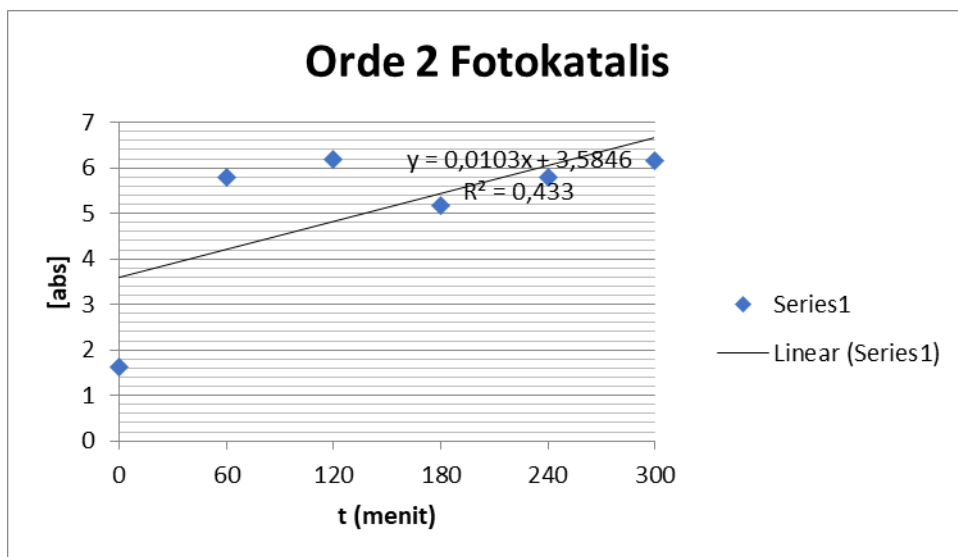
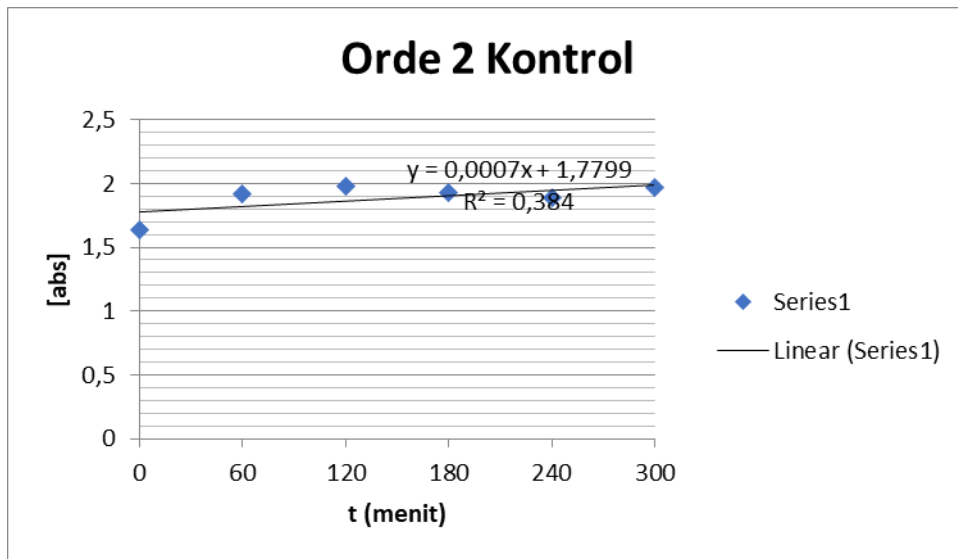
➤ Laju Reaksi

Orde 0			
$[abs] = -kt + [abs]_0$			
t (menit) (x)	y	t(menit) (x)	y
0	0,612	0	0,612
60	0,52	60	0,1725
120	0,505	120	0,16125
180	0,518	180	0,19375
240	0,531	240	0,17275
300	0,509	300	0,1625
Orde 1			
$\ln[abs] = -kt + \ln[abs]_0$			
t (menit) (x)	ln [abs]	t(menit) (x)	ln[abs]
0	-0,49102	0	-0,49102
60	-0,65393	60	-1,75736
120	-0,6832	120	-1,8248
180	-0,65778	180	-1,64119
240	-0,63299	240	-1,75591
300	-0,67531	300	-1,81708

Orde 2			
$1/[abs] = kt + 1/[abs]_0$			
t (menit) (x)	1/[abs]	t(menit) (x)	1/[abs]
0	1,633987	0	1,633987
60	1,923077	60	5,797101
120	1,980198	120	6,20155
180	1,930502	180	5,16129
240	1,883239	240	5,788712
300	1,964637	300	6,153846









Biodata Penulis

Aris Supriyadi merupakan nama penulis pada Tugas Akhir berjudul Sintesis Nanopartikel Seng Oksida-Perak (Nano ZnO-Ag) Sebagai Fotokatalis Untuk Mendegradasi Zat Warna Limbah Cair Batik. Penulis adalah anak ke-4 dari 4 bersaudara yang lahir dari pasangan Bapak Achmad Munawar dan Ibu Satinah di Banyumas 17 April 2001. Berdomisili di Banjarparakan RT 02 RW 11 Rawalo, Banyumas. Penulis dapat dihubungi melalui aris.soepriyadi02@gmail.com. Pendidikan formal penulis diawali di SD Negeri 3 Banjarparakan (2007-2013), dilanjutkan di SMP Negeri 1 Rawalo (2013-2016), SMA Negeri 1 Jatilawang (2016-2019) dan Politeknik Negeri Cilacap (2019-2023) pada Pendidikan Strata Sarjana Terapan Program Studi Teknik Pengendalian Pencemaran Lingkungan. Selama menjalani perkuliahan, penulis aktif dalam kegiatan organisasi dalam kampus, khususnya di Himpunan Mahasiswa Program Studi Teknik Pengendalian Pencemaran Lingkungan sebagai Divisi Kominfo. Penulisan tugas akhir ini tidak hanya ditujukan untuk menyelesaikan studi untuk mendapatkan gelar Sarjana Terapan (S. Tr), melainkan juga diharapkan dapat menjadi media untuk pengaplikasian ilmu pengetahuan yang didapat selama proses pembelajaran sehingga dapat meningkatkan kemampuan, wawasan, serta ketrampilan penulis dalam bidang pengelolaan lingkungan dan pengendalian pencemaran lingkungan.