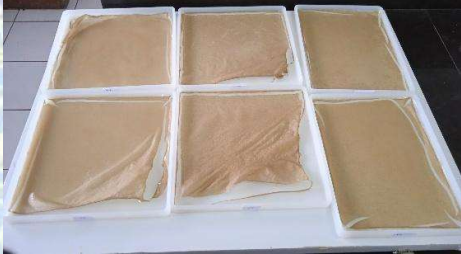
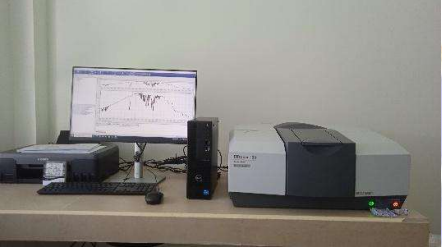
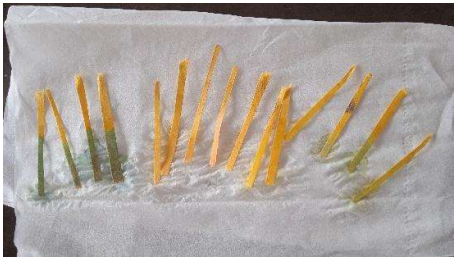


LAMPIRAN

Lampiran 01 Dokumentasi

	
Homogenisasi campuran	Campuran setelah diaduk dan dituang ke cetakan
	
Proses pemanasan	Hasil bioplastik setelah kering
	
Preparasi sampel untuk uji kuat tarik	Uji kuat tarik

	
Preparasi sampel untuk uji SEM	Preparasi sampel untuk uji FTIR
	
Uji FTIR	Preparasi sampel untuk uji titik leleh
	
Uji titik leleh	Uji berat jenis
	
Uji biodegradasi	Uji biodegradasi

	
Test pH larutan untuk uji kelarutan	Uji kelarutan bioplastik



Lampiran 02a Hasil Uji Kuat Tarik

a) Hasil Uji Kuat Tarik

Variasi		Maximum point load (N)	Maximum point stress (MPa)
V1	1	4,2274	1,691
	2	4,2276	1,6888
	3	4,2264	1,7093
V2	1	3,9892	1,5957
	2	3,9873	1,5998
	3	3,9888	1,6006
V3	1	3,565	1,426
	2	3,555	1,4887
	3	3,543	1,4961
V4	1	3,5001	1,4
	2	3,5014	1,4108
	3	3,5019	1,4454
V5	1	4,1607	1,6643
	2	4,16	1,6783
	3	4,1605	1,678
V6	1	4,9519	1,9808
	2	4,9498	1,9906
	3	4,9528	1,9913

b) ANOVA dan LSD Kuat Tarik

ANOVA

Kuat Tarik

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	231946489.78	5	46389297.956	.983	.467
Within Groups	566041595.33	12	47170132.944		
Total	797988085.11	17			

ANOVA Effect Sizes^{a,b}

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Kuat Tarik	Eta-squared	.291	.000	.427
	Epsilon-squared	-.005	-.417	.188
	Omega-squared Fixed-effect	-.005	-.385	.179
	Omega-squared Random-effect	-.001	-.059	.042

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.



Multiple Comparisons

Dependent Variable: Kuat Tarik

LSD

(I) Variasi	(J) Variasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
V1	V2	-4029.66667	5607.74066	.486	-16247.8840	8188.5506
	V3	1532.66667	5607.74066	.789	-10685.5506	13750.8840
	V4	2432.00000	5607.74066	.672	-9786.2173	14650.2173
	V5	256.00000	5607.74066	.964	-11962.2173	12474.2173
	V6	-7918.33333	5607.74066	.183	-20136.5506	4299.8840
V2	V1	4029.66667	5607.74066	.486	-8188.5506	16247.8840
	V3	5562.33333	5607.74066	.341	-6655.8840	17780.5506
	V4	6461.66667	5607.74066	.272	-5756.5506	18679.8840
	V5	4285.66667	5607.74066	.459	-7932.5506	16503.8840
	V6	-3888.66667	5607.74066	.501	-16106.8840	8329.5506
V3	V1	-1532.66667	5607.74066	.789	-13750.8840	10685.5506
	V2	-5562.33333	5607.74066	.341	-17780.5506	6655.8840
	V4	899.33333	5607.74066	.875	-11318.8840	13117.5506
	V5	-1276.66667	5607.74066	.824	-13494.8840	10941.5506
	V6	-9451.00000	5607.74066	.118	-21669.2173	2767.2173
V4	V1	-2432.00000	5607.74066	.672	-14650.2173	9786.2173
	V2	-6461.66667	5607.74066	.272	-18679.8840	5756.5506
	V3	-899.33333	5607.74066	.875	-13117.5506	11318.8840
	V5	-2176.00000	5607.74066	.705	-14394.2173	10042.2173
	V6	-10350.33333	5607.74066	.090	-22568.5506	1867.8840
V5	V1	-256.00000	5607.74066	.964	-12474.2173	11962.2173
	V2	-4285.66667	5607.74066	.459	-16503.8840	7932.5506
	V3	1276.66667	5607.74066	.824	-10941.5506	13494.8840
	V4	2176.00000	5607.74066	.705	-10042.2173	14394.2173
	V6	-8174.33333	5607.74066	.171	-20392.5506	4043.8840
V6	V1	7918.33333	5607.74066	.183	-4299.8840	20136.5506
	V2	3888.66667	5607.74066	.501	-8329.5506	16106.8840
	V3	9451.00000	5607.74066	.118	-2767.2173	21669.2173
	V4	10350.33333	5607.74066	.090	-1867.8840	22568.5506
	V5	8174.33333	5607.74066	.171	-4043.8840	20392.5506

Lampiran 02b Hasil Uji Titik Leleh

a) Hasil Uji Titik Leleh

Kode Sampel		Mulai Meleleh	Meleleh
V1	1	180	200
	2	180	200
	3	178	200
V2	1	180	200
	2	180	200
	3	180	200
V3	1	190	204
	2	188	204
	3	190	204
V4	1	194	208
	2	194	208
	3	195	208
V5	1	196	211
	2	196	211
	3	195	211
V6	1	198	214
	2	198	215
	3	197	215

b) ANOVA dan LSD

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Mulai Meleleh	Between Groups	964.944	5	192.989	315.800	<,.001
	Within Groups	7.333	12	.611		
	Total	972.278	17			
Meleleh	Between Groups	538.944	5	107.789	1940.200	<,.001
	Within Groups	.667	12	.056		
	Total	539.611	17			

ANOVA Effect Sizes ^a				
		Point Estimate	95% Confidence Interval	
			Lower	Upper
Mulai Meleleh	Eta-squared	.992	.969	.994
	Epsilon-squared	.989	.957	.992
	Omega-squared Fixed-effect	.989	.954	.991
	Omega-squared Random-effect	.946	.806	.958
Meleleh	Eta-squared	.999	.995	.999
	Epsilon-squared	.998	.993	.999
	Omega-squared Fixed-effect	.998	.992	.999
	Omega-squared Random-effect	.991	.963	.993

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.



Multiple Comparisons

LSD

Dependent Variable	(I) Variasi	(J) Variasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Mulai Meleleh	V1	V2	-.66667	.63828	.317	-2.0574	.7240
		V3	-10.00000*	.63828	<.001	-11.3907	-8.6093
		V4	-15.00000*	.63828	<.001	-16.3907	-13.6093
		V5	-16.33333*	.63828	<.001	-17.7240	-14.9426
		V6	-18.33333*	.63828	<.001	-19.7240	-16.9426
	V2	V1	.66667	.63828	.317	-.7240	2.0574
		V3	-9.33333*	.63828	<.001	-10.7240	-7.9426
		V4	-14.33333*	.63828	<.001	-15.7240	-12.9426
		V5	-15.66667*	.63828	<.001	-17.0574	-14.2760
		V6	-17.66667*	.63828	<.001	-19.0574	-16.2760
	V3	V1	10.00000*	.63828	<.001	8.6093	11.3907
		V2	9.33333*	.63828	<.001	7.9426	10.7240
		V4	-5.00000*	.63828	<.001	-6.3907	-3.6093
		V5	-6.33333*	.63828	<.001	-7.7240	-4.9426
		V6	-8.33333*	.63828	<.001	-9.7240	-6.9426
	V4	V1	15.00000*	.63828	<.001	13.6093	16.3907
		V2	14.33333*	.63828	<.001	12.9426	15.7240
		V3	5.00000*	.63828	<.001	3.6093	6.3907
		V5	-1.33333	.63828	.059	-2.7240	.0574
		V6	-3.33333*	.63828	<.001	-4.7240	-1.9426
	V5	V1	16.33333*	.63828	<.001	14.9426	17.7240
		V2	15.66667*	.63828	<.001	14.2760	17.0574
		V3	6.33333*	.63828	<.001	4.9426	7.7240
		V4	1.33333	.63828	.059	-.0574	2.7240
		V6	-2.00000*	.63828	.009	-3.3907	-.6093
	V6	V1	18.33333*	.63828	<.001	16.9426	19.7240
		V2	17.66667*	.63828	<.001	16.2760	19.0574
		V3	8.33333*	.63828	<.001	6.9426	9.7240
		V4	3.33333*	.63828	<.001	1.9426	4.7240
		V5	2.00000*	.63828	.009	.6093	3.3907
Meleleh	V1	V2	.00000	.19245	1.000	-.4193	.4193
		V3	-4.00000*	.19245	<.001	-4.4193	-3.5807
		V4	-8.00000*	.19245	<.001	-8.4193	-7.5807
		V5	-11.00000*	.19245	<.001	-11.4193	-10.5807
		V6	-14.66667*	.19245	<.001	-15.0860	-14.2474
	V2	V1	.00000	.19245	1.000	-.4193	.4193
		V3	-4.00000*	.19245	<.001	-4.4193	-3.5807
		V4	-8.00000*	.19245	<.001	-8.4193	-7.5807
		V5	-11.00000*	.19245	<.001	-11.4193	-10.5807
		V6	-14.66667*	.19245	<.001	-15.0860	-14.2474
	V3	V1	4.00000*	.19245	<.001	3.5807	4.4193
		V2	4.00000*	.19245	<.001	3.5807	4.4193
		V4	-4.00000*	.19245	<.001	-4.4193	-3.5807
		V5	-7.00000*	.19245	<.001	-7.4193	-6.5807
		V6	-10.66667*	.19245	<.001	-11.0860	-10.2474
	V4	V1	8.00000*	.19245	<.001	7.5807	8.4193
		V2	8.00000*	.19245	<.001	7.5807	8.4193
		V3	4.00000*	.19245	<.001	3.5807	4.4193
		V5	-3.00000*	.19245	<.001	-3.4193	-2.5807
		V6	-6.66667*	.19245	<.001	-7.0860	-6.2474
	V5	V1	11.00000*	.19245	<.001	10.5807	11.4193
		V2	11.00000*	.19245	<.001	10.5807	11.4193
		V3	7.00000*	.19245	<.001	6.5807	7.4193
		V4	3.00000*	.19245	<.001	2.5807	3.4193
		V6	-3.66667*	.19245	<.001	-4.0860	-3.2474
	V6	V1	14.66667*	.19245	<.001	14.2474	15.0860
		V2	14.66667*	.19245	<.001	14.2474	15.0860
		V3	10.66667*	.19245	<.001	10.2474	11.0860
		V4	6.66667*	.19245	<.001	6.2474	7.0860
		V5	3.66667*	.19245	<.001	3.2474	4.0860

*. The mean difference is significant at the 0.05 level.

Lampiran 02c Hasil Uji Berat Jenis

a) Perhitungan dan Tabel Berat Jenis

Adapun rumus untuk menghitung berat jenis dari bioplastik sebagai berikut.

$$\rho_{\text{sampel}} = \rho_{\text{air}} \times \frac{m_2 - m_0}{m_1 - m_0}$$

Keterangan:

M_0 = massa piknometer kosong (gram)

M_1 = massa piknometer + air (gram)

M_2 = massa piknometer + sampel (gram)

ρ_{air} = massa jenis air 0,996513 (g/mL) pada suhu 27°C (Usnaa., 2020)

ρ_{sampel} = berat jenis sampel (g/mL)

Contoh perhitungan:

a) V1

$$\begin{aligned}\rho_{\text{sampel}} &= 0,9965 \times \frac{45,8266 - 21,2696}{45,8019 - 21,2696} \\ &= 0,9975 \text{ g/mL}\end{aligned}$$

b) V6

$$\rho_{\text{sampel}} = 0,9965 \times \frac{45,8204 - 21,238}{45,8049 - 21,238}$$

$$= 0,9971 \text{ g/m}$$

Kode Sampel	Massa Awal Sampel	Massa Awal Piknometer	Massa Piknometer + Air	Massa Piknometer + Air + Sampel	Massa Air	Massa Jenis
V1	1	0,0928	21,2696	45,8019	45,8266	0,997516325
	2	0,0898	21,2606	45,7982	45,8174	0,997292744
	3	0,0818	21,2245	45,7675	45,8064	0,998092447
V2	1	0,0654	21,1208	45,7857	45,8006	0,997114991
	2	0,067	21,2068	45,7826	45,8106	0,997648359
	3	0,0686	21,1864	45,7776	45,7939	0,997173527
V3	1	0,09	21,2183	45,7864	45,7926	0,99676448
	2	0,093	21,2511	45,7614	45,8001	0,998086422
	3	0,096	21,2078	45,7584	45,8293	0,999390843
V4	1	0,0851	21,1868	45,7663	45,7967	0,99774549
	2	0,0957	21,2626	45,7884	45,8172	0,997683179
	3	0,091	21,2536	45,7538	45,8025	0,998493808
V5	1	0,1204	21,1651	45,7791	45,7854	0,996768059
	2	0,1284	21,1828	45,7552	45,8982	1,002312245
	3	0,1249	21,2146	45,7696	45,8215	0,998619252
V6	1	0,1213	21,238	45,8049	45,8204	0,99714173
	2	0,1227	21,2835	45,7762	45,8158	0,99812417
	3	0,1208	21,2815	45,8062	45,8199	0,997069673

b) ANOVA dan LSD Berat Jenis

ANOVA

Berat Jenis

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.000	5	.000	90.756	<.001
Within Groups	.000	12	.000		
Total	.000	17			

ANOVA Effect Sizes^a

			95% Confidence Interval	
Point Estimate			Lower	Upper
Berat Jenis	Eta-squared	.974	.897	.980
	Epsilon-squared	.964	.854	.972
	Omega-squared Fixed-effect	.961	.846	.970
	Omega-squared Random-effect	.833	.524	.867

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.



Multiple Comparisons

Dependent Variable: Berat Jenis

LSD

(I) Variasi	(J) Variasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
V1	V2	.00087 [*]	.00013	<.001	.0006	.0012
	V3	-.00020	.00013	.159	-.0005	.0001
	V4	-.00010	.00013	.456	-.0004	.0002
	V5	-.00149 [*]	.00013	<.001	-.0018	-.0012
	V6	-.00137 [*]	.00013	<.001	-.0017	-.0011
V2	V1	-.00087 [*]	.00013	<.001	-.0012	-.0006
	V3	-.00107 [*]	.00013	<.001	-.0014	-.0008
	V4	-.00097 [*]	.00013	<.001	-.0013	-.0007
	V5	-.00236 [*]	.00013	<.001	-.0026	-.0021
	V6	-.00224 [*]	.00013	<.001	-.0025	-.0019
V3	V1	.00020	.00013	.159	-.0001	.0005
	V2	.00107 [*]	.00013	<.001	.0008	.0014
	V4	.00010	.00013	.479	-.0002	.0004
	V5	-.00129 [*]	.00013	<.001	-.0016	-.0010
	V6	-.00117 [*]	.00013	<.001	-.0015	-.0009
V4	V1	.00010	.00013	.456	-.0002	.0004
	V2	.00097 [*]	.00013	<.001	.0007	.0013
	V3	-.00010	.00013	.479	-.0004	.0002
	V5	-.00138 [*]	.00013	<.001	-.0017	-.0011
	V6	-.00126 [*]	.00013	<.001	-.0016	-.0010
V5	V1	.00149 [*]	.00013	<.001	.0012	.0018
	V2	.00236 [*]	.00013	<.001	.0021	.0026
	V3	.00129 [*]	.00013	<.001	.0010	.0016
	V4	.00138 [*]	.00013	<.001	.0011	.0017
	V6	.00012	.00013	.386	-.0002	.0004
V6	V1	.00137 [*]	.00013	<.001	.0011	.0017
	V2	.00224 [*]	.00013	<.001	.0019	.0025
	V3	.00117 [*]	.00013	<.001	.0009	.0015
	V4	.00126 [*]	.00013	<.001	.0010	.0016
	V5	-.00012	.00013	.386	-.0004	.0002

*. The mean difference is significant at the 0.05 level.

Lampiran 02d Hasil Uji Kelarutan

a) Tabel Kelarutan Bioplastik

00.00 20 Feb		pH 5.0		
Variasi		Ulangan		
		1	2	3
V1		730	728	730
V2		734	734	731
V3		739	736	736
V4		738	738	734
V5		740	739	737
V6		740	740	740
		Jumlah		
		Rerata		

12.00 20 Feb		pH 5.0		
Variasi		Ulangan		
		1	2	3
V1		994	995	995
V2		973	977	964
V3		1032	1030	1030
V4		995	998	995
V5		1513	1511	1511
V6		1592	1590	1590
		Jumlah		
		Rerata		

00.00 21 Feb		pH 5.0		
Variasi		Ulangan		
		1	2	3
V1		1029	1028	1030
V2		975	978	974
V3		1230	1233	1230
V4		1136	1132	1133
V5		1701	1711	1708
V6		1790	1794	1798
		Jumlah		
		Rerata		

00.00 20 Feb		pH 7.0		
Variasi		Ulangan		
		1	2	3
V1		548	544	547
V2		571	570	571
V3		545	544	543
V4		548	548	546
V5		557	557	555
V6		582	579	580
		Jumlah		
		Rerata		

12.00 20 Feb		pH 7.0		
Variasi		Ulangan		
		1	2	3
V1		898	899	897
V2		910	909	906
V3		920	928	930
V4		933	933	935
V5		1262	1260	1260
V6		1284	1283	1285
		Jumlah		
		Rerata		

00.00 21 Feb		pH 7.0		
Variasi		Ulangan		
		1	2	3
V1		904	909	901
V2		913	913	910
V3		938	936	935
V4		944	943	942
V5		1318	1319	1318
V6		1343	1344	1342
		Jumlah		
		Rerata		

00.00 20 Feb		pH 9.0		
Variasi		Ulangan		
		1	2	3
V1		408	416	414
V2		420	419	421
V3		433	424	429
V4		435	434	435
V5		436	438	436
V6		451	452	451
		Jumlah		
		Rerata		

12.00 20 Feb		pH 9.0		
Variasi		Ulangan		
		1	2	3
V1		820	822	819
V2		783	783	788
V3		910	920	920
V4		933	935	930
V5		1060	1066	1062
V6		1081	1083	1086
		Jumlah		
		Rerata		

00.00 21 Feb		pH 9.0		
Variasi		Ulangan		
		1	2	3
V1		821	840	844
V2		792	750	796
V3		922	926	923
V4		980	984	988
V5		1111	1120	1117
V6		1138	1134	1140
		Jumlah		
		Rerata		

b) ANOVA dan LSD Kelarutan Bioplastik

Kelarutan pada pH 5.0

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Kelarutan pH 5 a	Between Groups	233.111	5	46.622	18.649	<,001
	Within Groups	30.000	12	2.500		
	Total	263.111	17			
Kelarutan pH 5 b	Between Groups	1237977.167	5	247595.433	28753.018	<,001
	Within Groups	103.333	12	8.611		
	Total	1238080.500	17			
Kelarutan pH c	Between Groups	1858974.000	5	371794.800	40559.433	<,001
	Within Groups	110.000	12	9.167		
	Total	1859084.000	17			

ANOVA Effect Sizes^a

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Kelarutan pH 5 a	Eta-squared	.886	.578	.913
	Epsilon-squared	.838	.402	.877
	Omega-squared Fixed-effect	.831	.389	.871
	Omega-squared Random-effect	.495	.113	.574
Kelarutan pH 5 b	Eta-squared	1.000	1.000	1.000
	Epsilon-squared	1.000	1.000	1.000
	Omega-squared Fixed-effect	1.000	.999	1.000
	Omega-squared Random-effect	.999	.997	1.000
Kelarutan pH c	Eta-squared	1.000	1.000	1.000
	Epsilon-squared	1.000	1.000	1.000
	Omega-squared Fixed-effect	1.000	1.000	1.000
	Omega-squared Random-effect	1.000	.998	1.000

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Multiple Comparisons

LSD

Dependent Variable	(I) Variasi	(J) Variasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Kelarutan pH 5 a	V1	V2	-3.66667*	1.29099	.015	-6.4795	-.8538
		V3	-7.66667*	1.29099	<.001	-10.4795	-4.8538
		V4	-7.33333*	1.29099	<.001	-10.1462	-4.5205
		V5	-9.33333*	1.29099	<.001	-12.1462	-6.5205
		V6	-10.66667*	1.29099	<.001	-13.4795	-7.8538
	V2	V1	3.66667*	1.29099	.015	.8538	6.4795
		V3	-4.00000*	1.29099	.009	-6.8128	-1.1872
		V4	-3.66667*	1.29099	.015	-6.4795	-.8538
		V5	-5.66667*	1.29099	<.001	-8.4795	-2.8538
		V6	-7.00000*	1.29099	<.001	-9.8128	-4.1872
	V3	V1	7.66667*	1.29099	<.001	4.8538	10.4795
		V2	4.00000*	1.29099	.009	1.1872	6.8128
		V4	.33333	1.29099	.801	-2.4795	3.1462
		V5	-1.66667	1.29099	.221	-4.4795	1.1462
		V6	-3.00000*	1.29099	.039	-5.8128	-.1872
	V4	V1	7.33333*	1.29099	<.001	4.5205	10.1462
		V2	3.66667*	1.29099	.015	.8538	6.4795
		V3	-.33333	1.29099	.801	-3.1462	2.4795
		V5	-2.00000	1.29099	.147	-4.8128	.8128
		V6	-3.33333*	1.29099	.024	-6.1462	-.5205
	V5	V1	9.33333*	1.29099	<.001	6.5205	12.1462
		V2	5.66667*	1.29099	<.001	2.8538	8.4795
		V3	1.66667	1.29099	.221	-1.1462	4.4795
		V4	2.00000	1.29099	.147	-.8128	4.8128
		V6	-1.33333	1.29099	.322	-4.1462	1.4795
	V6	V1	10.66667*	1.29099	<.001	7.8538	13.4795
		V2	7.00000*	1.29099	<.001	4.1872	9.8128
		V3	3.00000*	1.29099	.039	.1872	5.8128
		V4	3.33333*	1.29099	.024	.5205	6.1462
		V5	1.33333	1.29099	.322	-1.4795	4.1462
Kelarutan pH 5 b	V1	V2	23.33333*	2.39598	<.001	18.1129	28.5537
		V3	-36.00000*	2.39598	<.001	-41.2204	-30.7796
		V4	-1.33333	2.39598	.588	-6.5537	3.8871
		V5	-517.00000*	2.39598	<.001	-522.2204	-511.7796
		V6	-596.00000*	2.39598	<.001	-601.2204	-590.7796
	V2	V1	-23.33333*	2.39598	<.001	-28.5537	-18.1129
		V3	-59.33333*	2.39598	<.001	-64.5537	-54.1129
		V4	-24.66667*	2.39598	<.001	-29.8871	-19.4463
		V5	-540.33333*	2.39598	<.001	-545.5537	-535.1129
		V6	-619.33333*	2.39598	<.001	-624.5537	-614.1129

	V3	V1	36.00000*	2.39598	<,001	30.7796	41.2204
		V2	59.33333*	2.39598	<,001	54.1129	64.5537
		V4	34.66667*	2.39598	<,001	29.4463	39.8871
		V5	-481.00000*	2.39598	<,001	-486.2204	-475.7796
		V6	-560.00000*	2.39598	<,001	-565.2204	-554.7796
	V4	V1	1.33333	2.39598	.588	-3.8871	6.5537
		V2	24.66667*	2.39598	<,001	19.4463	29.8871
		V3	-34.66667*	2.39598	<,001	-39.8871	-29.4463
		V5	-515.66667*	2.39598	<,001	-520.8871	-510.4463
		V6	-594.66667*	2.39598	<,001	-599.8871	-589.4463
	V5	V1	517.00000*	2.39598	<,001	511.7796	522.2204
		V2	540.33333*	2.39598	<,001	535.1129	545.5537
		V3	481.00000*	2.39598	<,001	475.7796	486.2204
		V4	515.66667*	2.39598	<,001	510.4463	520.8871
		V6	-79.00000*	2.39598	<,001	-84.2204	-73.7796
	V6	V1	596.00000*	2.39598	<,001	590.7796	601.2204
		V2	619.33333*	2.39598	<,001	614.1129	624.5537
		V3	560.00000*	2.39598	<,001	554.7796	565.2204
		V4	594.66667*	2.39598	<,001	589.4463	599.8871
		V5	79.00000*	2.39598	<,001	73.7796	84.2204
Kelarutan pH c	V1	V2	53.33333*	2.47207	<,001	47.9472	58.7195
		V3	-202.00000*	2.47207	<,001	-207.3862	-196.6138
		V4	-104.66667*	2.47207	<,001	-110.0528	-99.2805
		V5	-677.66667*	2.47207	<,001	-683.0528	-672.2805
		V6	-765.00000*	2.47207	<,001	-770.3862	-759.6138
	V2	V1	-53.33333*	2.47207	<,001	-58.7195	-47.9472
		V3	-255.33333*	2.47207	<,001	-260.7195	-249.9472
		V4	-158.00000*	2.47207	<,001	-163.3862	-152.6138
		V5	-731.00000*	2.47207	<,001	-736.3862	-725.6138
		V6	-818.33333*	2.47207	<,001	-823.7195	-812.9472
	V3	V1	202.00000*	2.47207	<,001	196.6138	207.3862
		V2	255.33333*	2.47207	<,001	249.9472	260.7195
		V4	97.33333*	2.47207	<,001	91.9472	102.7195
		V5	-475.66667*	2.47207	<,001	-481.0528	-470.2805
		V6	-563.00000*	2.47207	<,001	-568.3862	-557.6138
	V4	V1	104.66667*	2.47207	<,001	99.2805	110.0528
		V2	158.00000*	2.47207	<,001	152.6138	163.3862
		V3	-97.33333*	2.47207	<,001	-102.7195	-91.9472
		V5	-573.00000*	2.47207	<,001	-578.3862	-567.6138
		V6	-660.33333*	2.47207	<,001	-665.7195	-654.9472
	V5	V1	677.66667*	2.47207	<,001	672.2805	683.0528
		V2	731.00000*	2.47207	<,001	725.6138	736.3862
		V3	475.66667*	2.47207	<,001	470.2805	481.0528
		V4	573.00000*	2.47207	<,001	567.6138	578.3862
		V6	-87.33333*	2.47207	<,001	-92.7195	-81.9472
	V6	V1	765.00000*	2.47207	<,001	759.6138	770.3862
		V2	818.33333*	2.47207	<,001	812.9472	823.7195
		V3	563.00000*	2.47207	<,001	557.6138	568.3862
		V4	660.33333*	2.47207	<,001	654.9472	665.7195
		V5	87.33333*	2.47207	<,001	81.9472	92.7195

*. The mean difference is significant at the 0.05 level.

Kelarutan pada pH 7.0

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Kelarutan pH 7 a	Between Groups	3319.167	5	663.833	373.406	<.,001
	Within Groups	21.333	12	1.778		
	Total	3340.500	17			
Kelarutan pH 7 b	Between Groups	509667.778	5	101933.556	16529.766	<.,001
	Within Groups	74.000	12	6.167		
	Total	509741.778	17			
Kelarutan ph 7 c	Between Groups	665516.444	5	133103.289	33275.822	<.,001
	Within Groups	48.000	12	4.000		
	Total	665564.444	17			

ANOVA Effect Sizes^a

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Kelarutan pH 7 a	Eta-squared	.994	.974	.995
	Epsilon-squared	.991	.963	.993
	Omega-squared Fixed-effect	.990	.961	.993
	Omega-squared Random-effect	.954	.832	.964
Kelarutan pH 7 b	Eta-squared	1.000	.999	1.000
	Epsilon-squared	1.000	.999	1.000
	Omega-squared Fixed-effect	1.000	.999	1.000
	Omega-squared Random-effect	.999	.996	.999
Kelarutan ph 7 c	Eta-squared	1.000	1.000	1.000
	Epsilon-squared	1.000	1.000	1.000
	Omega-squared Fixed-effect	1.000	1.000	1.000
	Omega-squared Random-effect	.999	.998	1.000

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Multiple Comparisons

LSD

Dependent Variable	(I) Variasi	(J) Variasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Kelarutan pH 7 a	V1	V2	-24.33333 [*]	1.08866	<,001	-26.7053	-21.9613
		V3	2.33333	1.08866	.053	-.0387	4.7053
		V4	-1.00000	1.08866	.376	-3.3720	1.3720
		V5	-10.00000 [*]	1.08866	<,001	-12.3720	-7.6280
		V6	-34.00000 [*]	1.08866	<,001	-36.3720	-31.6280
	V2	V1	24.33333 [*]	1.08866	<,001	21.9613	26.7053
		V3	26.66667 [*]	1.08866	<,001	24.2947	29.0387
		V4	23.33333 [*]	1.08866	<,001	20.9613	25.7053
		V5	14.33333 [*]	1.08866	<,001	11.9613	16.7053
		V6	-9.66667 [*]	1.08866	<,001	-12.0387	-7.2947
	V3	V1	-2.33333	1.08866	.053	-4.7053	.0387
		V2	-26.66667 [*]	1.08866	<,001	-29.0387	-24.2947
		V4	-3.33333 [*]	1.08866	.010	-5.7053	-.9613
		V5	-12.33333 [*]	1.08866	<,001	-14.7053	-9.9613
		V6	-36.33333 [*]	1.08866	<,001	-38.7053	-33.9613
	V4	V1	1.00000	1.08866	.376	-1.3720	3.3720
		V2	-23.33333 [*]	1.08866	<,001	-25.7053	-20.9613
		V3	3.33333 [*]	1.08866	.010	.9613	5.7053
		V5	-9.00000 [*]	1.08866	<,001	-11.3720	-6.6280
		V6	-33.00000 [*]	1.08866	<,001	-35.3720	-30.6280
	V5	V1	10.00000 [*]	1.08866	<,001	7.6280	12.3720
		V2	-14.33333 [*]	1.08866	<,001	-16.7053	-11.9613
		V3	12.33333 [*]	1.08866	<,001	9.9613	14.7053
		V4	9.00000 [*]	1.08866	<,001	6.6280	11.3720
		V6	-24.00000 [*]	1.08866	<,001	-26.3720	-21.6280
	V6	V1	34.00000 [*]	1.08866	<,001	31.6280	36.3720
		V2	9.66667 [*]	1.08866	<,001	7.2947	12.0387
		V3	36.33333 [*]	1.08866	<,001	33.9613	38.7053
		V4	33.00000 [*]	1.08866	<,001	30.6280	35.3720
		V5	24.00000 [*]	1.08866	<,001	21.6280	26.3720
Kelarutan pH 7 b	V1	V2	-10.33333 [*]	2.02759	<,001	-14.7511	-5.9156
		V3	-28.00000 [*]	2.02759	<,001	-32.4177	-23.5823
		V4	-35.66667 [*]	2.02759	<,001	-40.0844	-31.2489
		V5	-362.66667 [*]	2.02759	<,001	-367.0844	-358.2489
		V6	-386.00000 [*]	2.02759	<,001	-390.4177	-381.5823
	V2	V1	10.33333 [*]	2.02759	<,001	5.9156	14.7511
		V3	-17.66667 [*]	2.02759	<,001	-22.0844	-13.2489
		V4	-25.33333 [*]	2.02759	<,001	-29.7511	-20.9156
		V5	-352.33333 [*]	2.02759	<,001	-356.7511	-347.9156
		V6	-375.66667 [*]	2.02759	<,001	-380.0844	-371.2489

	V3	V1	28.00000*	2.02759	<,001	23.5823	32.4177
		V2	17.66667*	2.02759	<,001	13.2489	22.0844
		V4	-7.66667*	2.02759	.003	-12.0844	-3.2489
		V5	-334.66667*	2.02759	<,001	-339.0844	-330.2489
		V6	-358.00000*	2.02759	<,001	-362.4177	-353.5823
	V4	V1	35.66667*	2.02759	<,001	31.2489	40.0844
		V2	25.33333*	2.02759	<,001	20.9156	29.7511
		V3	7.66667*	2.02759	.003	3.2489	12.0844
		V5	-327.00000*	2.02759	<,001	-331.4177	-322.5823
		V6	-350.33333*	2.02759	<,001	-354.7511	-345.9156
	V5	V1	362.66667*	2.02759	<,001	358.2489	367.0844
		V2	352.33333*	2.02759	<,001	347.9156	356.7511
		V3	334.66667*	2.02759	<,001	330.2489	339.0844
		V4	327.00000*	2.02759	<,001	322.5823	331.4177
		V6	-23.33333*	2.02759	<,001	-27.7511	-18.9156
	V6	V1	386.00000*	2.02759	<,001	381.5823	390.4177
		V2	375.66667*	2.02759	<,001	371.2489	380.0844
		V3	358.00000*	2.02759	<,001	353.5823	362.4177
		V4	350.33333*	2.02759	<,001	345.9156	354.7511
		V5	23.33333*	2.02759	<,001	18.9156	27.7511
Kelarutan ph 7 c	V1	V2	-7.33333*	1.63299	<,001	-10.8913	-3.7753
		V3	-31.66667*	1.63299	<,001	-35.2247	-28.1087
		V4	-38.33333*	1.63299	<,001	-41.8913	-34.7753
		V5	-413.66667*	1.63299	<,001	-417.2247	-410.1087
		V6	-438.33333*	1.63299	<,001	-441.8913	-434.7753
	V2	V1	7.33333*	1.63299	<,001	3.7753	10.8913
		V3	-24.33333*	1.63299	<,001	-27.8913	-20.7753
		V4	-31.00000*	1.63299	<,001	-34.5580	-27.4420
		V5	-406.33333*	1.63299	<,001	-409.8913	-402.7753
		V6	-431.00000*	1.63299	<,001	-434.5580	-427.4420
	V3	V1	31.66667*	1.63299	<,001	28.1087	35.2247
		V2	24.33333*	1.63299	<,001	20.7753	27.8913
		V4	-6.66667*	1.63299	.002	-10.2247	-3.1087
		V5	-382.00000*	1.63299	<,001	-385.5580	-378.4420
		V6	-406.66667*	1.63299	<,001	-410.2247	-403.1087
	V4	V1	38.33333*	1.63299	<,001	34.7753	41.8913
		V2	31.00000*	1.63299	<,001	27.4420	34.5580
		V3	6.66667*	1.63299	.002	3.1087	10.2247
		V5	-375.33333*	1.63299	<,001	-378.8913	-371.7753
		V6	-400.00000*	1.63299	<,001	-403.5580	-396.4420
	V5	V1	413.66667*	1.63299	<,001	410.1087	417.2247
		V2	406.33333*	1.63299	<,001	402.7753	409.8913
		V3	382.00000*	1.63299	<,001	378.4420	385.5580
		V4	375.33333*	1.63299	<,001	371.7753	378.8913
		V6	-24.66667*	1.63299	<,001	-28.2247	-21.1087
	V6	V1	438.33333*	1.63299	<,001	434.7753	441.8913
		V2	431.00000*	1.63299	<,001	427.4420	434.5580
		V3	406.66667*	1.63299	<,001	403.1087	410.2247
		V4	400.00000*	1.63299	<,001	396.4420	403.5580
		V5	24.66667*	1.63299	<,001	21.1087	28.2247

*. The mean difference is significant at the 0.05 level.

Kelarutan pada pH 9.0

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Kelarutan pH 9 a	Between Groups	2762.667	5	552.533	81.521	<.,001
	Within Groups	81.333	12	6.778		
	Total	2844.000	17			
Kelarutan pH 9 b	Between Groups	223128.278	5	44625.656	4056.878	<.,001
	Within Groups	132.000	12	11.000		
	Total	223260.278	17			
Kelarutan pH 9 c	Between Groups	317716.444	5	63543.289	448.014	<.,001
	Within Groups	1702.000	12	141.833		
	Total	319418.444	17			



ANOVA Effect Sizes^a

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Kelarutan pH 9 a	Eta-squared	.971	.886	.978
	Epsilon-squared	.959	.838	.969
	Omega-squared Fixed-effect	.957	.830	.967
	Omega-squared Random-effect	.817	.494	.855
Kelarutan pH 9 b	Eta-squared	.999	.998	1.000
	Epsilon-squared	.999	.997	.999
	Omega-squared Fixed-effect	.999	.996	.999
	Omega-squared Random-effect	.996	.982	.997
Kelarutan pH 9 c	Eta-squared	.995	.978	.996
	Epsilon-squared	.992	.969	.994
	Omega-squared Fixed-effect	.992	.968	.994
	Omega-squared Random-effect	.961	.856	.970

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Multiple Comparisons

LSD

Dependent Variable	(I) Variasi	(J) Variasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Kelarutan pH 9 a	V1	V2	-7.33333 ^a	2.12568	.005	-11.9648	-2.7019
		V3	-16.00000 ^a	2.12568	<.001	-20.6315	-11.3685
		V4	-22.00000 ^a	2.12568	<.001	-26.6315	-17.3685
		V5	-24.00000 ^a	2.12568	<.001	-28.6315	-19.3685
		V6	-38.66667 ^a	2.12568	<.001	-43.2981	-34.0352
	V2	V1	7.33333 ^a	2.12568	.005	2.7019	11.9648
		V3	-8.66667 ^a	2.12568	.002	-13.2981	-4.0352
		V4	-14.66667 ^a	2.12568	<.001	-19.2981	-10.0352
		V5	-16.66667 ^a	2.12568	<.001	-21.2981	-12.0352
		V6	-31.33333 ^a	2.12568	<.001	-35.9648	-26.7019
	V3	V1	16.00000 ^a	2.12568	<.001	11.3685	20.6315
		V2	8.66667 ^a	2.12568	.002	4.0352	13.2981
		V4	-6.00000 ^a	2.12568	.015	-10.6315	-1.3685
		V5	-8.00000 ^a	2.12568	.003	-12.6315	-3.3685
		V6	-22.66667 ^a	2.12568	<.001	-27.2981	-18.0352
	V4	V1	22.00000 ^a	2.12568	<.001	17.3685	26.6315
		V2	14.66667 ^a	2.12568	<.001	10.0352	19.2981
		V3	6.00000 ^a	2.12568	.015	1.3685	10.6315
		V5	-2.00000	2.12568	.365	-6.6315	2.6315
		V6	-16.66667 ^a	2.12568	<.001	-21.2981	-12.0352
	V5	V1	24.00000 ^a	2.12568	<.001	19.3685	28.6315
		V2	16.66667 ^a	2.12568	<.001	12.0352	21.2981
		V3	8.00000 ^a	2.12568	.003	3.3685	12.6315
		V4	2.00000	2.12568	.365	-2.6315	6.6315
		V6	-14.66667 ^a	2.12568	<.001	-19.2981	-10.0352
	V6	V1	38.66667 ^a	2.12568	<.001	34.0352	43.2981
		V2	31.33333 ^a	2.12568	<.001	26.7019	35.9648
		V3	22.66667 ^a	2.12568	<.001	18.0352	27.2981
		V4	16.66667 ^a	2.12568	<.001	12.0352	21.2981
		V5	14.66667 ^a	2.12568	<.001	10.0352	19.2981
Kelarutan pH 9 b	V1	V2	35.66667 ^a	2.70801	<.001	29.7664	41.5669
		V3	-96.33333 ^a	2.70801	<.001	-102.2336	-90.4331
		V4	-112.33333 ^a	2.70801	<.001	-118.2336	-106.4331
		V5	-242.33333 ^a	2.70801	<.001	-248.2336	-236.4331
		V6	-263.00000 ^a	2.70801	<.001	-268.9003	-257.0997
	V2	V1	-35.66667 ^a	2.70801	<.001	-41.5669	-29.7664
		V3	-132.00000 ^a	2.70801	<.001	-137.9003	-126.0997
		V4	-148.00000 ^a	2.70801	<.001	-153.9003	-142.0997
		V5	-278.00000 ^a	2.70801	<.001	-283.9003	-272.0997
		V6	-298.66667 ^a	2.70801	<.001	-304.5669	-292.7664

	V3	V1	96.33333 [*]	2.70801	<.001	90.4331	102.2336
		V2	132.00000 [*]	2.70801	<.001	126.0997	137.9003
		V4	-16.00000 [*]	2.70801	<.001	-21.9003	-10.0997
		V5	-146.00000 [*]	2.70801	<.001	-151.9003	-140.0997
		V6	-166.66667 [*]	2.70801	<.001	-172.5669	-160.7664
	V4	V1	112.33333 [*]	2.70801	<.001	106.4331	118.2336
		V2	148.00000 [*]	2.70801	<.001	142.0997	153.9003
		V3	16.00000 [*]	2.70801	<.001	10.0997	21.9003
		V5	-130.00000 [*]	2.70801	<.001	-135.9003	-124.0997
		V6	-150.66667 [*]	2.70801	<.001	-156.5669	-144.7664
	V5	V1	242.33333 [*]	2.70801	<.001	236.4331	248.2336
		V2	278.00000 [*]	2.70801	<.001	272.0997	283.9003
		V3	146.00000 [*]	2.70801	<.001	140.0997	151.9003
		V4	130.00000 [*]	2.70801	<.001	124.0997	135.9003
		V6	-20.66667 [*]	2.70801	<.001	-26.5669	-14.7664
	V6	V1	263.00000 [*]	2.70801	<.001	257.0997	268.9003
		V2	298.66667 [*]	2.70801	<.001	292.7664	304.5669
		V3	166.66667 [*]	2.70801	<.001	160.7664	172.5669
		V4	150.66667 [*]	2.70801	<.001	144.7664	156.5669
		V5	20.66667 [*]	2.70801	<.001	14.7664	26.5669
Kelarutan pH 9 c	V1	V2	55.66667 [*]	9.72397	<.001	34.4800	76.8534
		V3	-88.66667 [*]	9.72397	<.001	-109.8534	-67.4800
		V4	-149.00000 [*]	9.72397	<.001	-170.1867	-127.8133
		V5	-281.00000 [*]	9.72397	<.001	-302.1867	-259.8133
		V6	-302.33333 [*]	9.72397	<.001	-323.5200	-281.1466
	V2	V1	-55.66667 [*]	9.72397	<.001	-76.8534	-34.4800
		V3	-144.33333 [*]	9.72397	<.001	-165.5200	-123.1466
		V4	-204.66667 [*]	9.72397	<.001	-225.8534	-183.4800
		V5	-336.66667 [*]	9.72397	<.001	-357.8534	-315.4800
		V6	-358.00000 [*]	9.72397	<.001	-379.1867	-336.8133
	V3	V1	88.66667 [*]	9.72397	<.001	67.4800	109.8534
		V2	144.33333 [*]	9.72397	<.001	123.1466	165.5200
		V4	-60.33333 [*]	9.72397	<.001	-81.5200	-39.1466
		V5	-192.33333 [*]	9.72397	<.001	-213.5200	-171.1466
		V6	-213.66667 [*]	9.72397	<.001	-234.8534	-192.4800
	V4	V1	149.00000 [*]	9.72397	<.001	127.8133	170.1867
		V2	204.66667 [*]	9.72397	<.001	183.4800	225.8534
		V3	60.33333 [*]	9.72397	<.001	39.1466	81.5200
		V5	-132.00000 [*]	9.72397	<.001	-153.1867	-110.8133
		V6	-153.33333 [*]	9.72397	<.001	-174.5200	-132.1466
	V5	V1	281.00000 [*]	9.72397	<.001	259.8133	302.1867
		V2	336.66667 [*]	9.72397	<.001	315.4800	357.8534
		V3	192.33333 [*]	9.72397	<.001	171.1466	213.5200
		V4	132.00000 [*]	9.72397	<.001	110.8133	153.1867
		V6	-21.33333 [*]	9.72397	.049	-42.5200	-1.1466
	V6	V1	302.33333 [*]	9.72397	<.001	281.1466	323.5200
		V2	358.00000 [*]	9.72397	<.001	336.8133	379.1867
		V3	213.66667 [*]	9.72397	<.001	192.4800	234.8534
		V4	153.33333 [*]	9.72397	<.001	132.1466	174.5200
		V5	21.33333 [*]	9.72397	.049	.1466	42.5200

*. The mean difference is significant at the 0.05 level.

Lampiran 02e Hasil Uji Biodegradasi

a) Tabel Biodegradasi

Kode Sampel	Massa Awal (gram)	Massa Setelah Biodegradasi (gram)												
		Hari 8	%Berat hilang hari ke 8	Hari 10	%Berat hilang hari ke 10	Hari 12	%Berat hilang hari ke 12	Hari 14	%Berat hilang hari ke 14	Hari 16	%Berat hilang hari ke 16	Hari 18	%Berat hilang hari ke 18	
V1	1	3	1,48	51%	1,04	65%	0,51	83%	0,06	98%	0	100%	0	100%
	2	3	1,5	50%	1,04	65%	0,52	83%	0,06	98%	0	100%	0	100%
	3	3	1,49	50%	1,06	65%	0,53	82%	0,07	98%	0	100%	0	100%
V2	1	3	1,56	48%	1,08	64%	0,54	82%	0,07	98%	0	100%	0	100%
	2	3	1,58	47%	1,09	64%	0,54	82%	0,08	97%	0	100%	0	100%
	3	3	1,55	48%	1,08	64%	0,54	82%	0,07	98%	0	100%	0	100%
V3	1	3	1,58	47%	1,09	64%	0,56	81%	0,08	97%	0	100%	0	100%
	2	3	1,6	47%	1,1	63%	0,55	82%	0,07	98%	0	100%	0	100%
	3	3	1,6	47%	1,12	63%	0,56	81%	0,08	97%	0	100%	0	100%
V4	1	3	1,61	46%	1,12	63%	0,59	80%	0,09	97%	0	100%	0	100%
	2	3	1,61	46%	1,13	62%	0,6	80%	0,09	97%	0	100%	0	100%
	3	3	1,63	46%	1,13	62%	0,6	80%	0,09	97%	0	100%	0	100%
V5	1	3	1,6	47%	1,12	63%	0,63	79%	0,1	97%	0,04	99%	0	100%
	2	3	1,63	46%	1,14	62%	0,63	79%	0,1	97%	0,04	99%	0	100%
	3	3	1,65	45%	1,15	62%	0,65	78%	0,11	96%	0,04	99%	0	100%
V6	1	3	1,68	44%	1,18	61%	0,69	77%	0,15	95%	0,05	98%	0	100%
	2	3	1,66	45%	1,14	62%	0,65	78%	0,11	96%	0,05	98%	0	100%
	3	3	1,68	44%	1,16	61%	0,67	78%	0,13	96%	0,06	98%	0	100%

b) Hasil Uji ANOVA dan LSD

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Hari ke 8	Between Groups	25256.444	5	5051.289	1.518	.256
	Within Groups	39939.333	12	3328.278		
	Total	65195.778	17			
Hari ke 10	Between Groups	3091.111	5	618.222	1.120	.400
	Within Groups	6621.333	12	551.778		
	Total	9712.444	17			
Hari ke 12	Between Groups	3536.000	5	707.200	4.500	.015
	Within Groups	1886.000	12	157.167		
	Total	5422.000	17			
Hari ke 14	Between Groups	128.278	5	25.656	4.016	.023
	Within Groups	76.667	12	6.389		
	Total	204.944	17			
Hari ke 16	Between Groups	89.778	5	17.956	323.200	<.001
	Within Groups	.667	12	.056		
	Total	90.444	17			
Hari ke 18	Between Groups	.000	5	.000		
	Within Groups	.000	12	.000		
	Total	.000	17			



ANOVA Effect Sizes^{a,b}

			95% Confidence Interval	
Point Estimate			Lower	Upper
Hari ke 8	Eta-squared	.387	.000	.520
	Epsilon-squared	.132	-.417	.321
	Omega-squared Fixed-effect	.126	-.385	.308
	Omega-squared Random-effect	.028	-.059	.082
Hari ke 10	Eta-squared	.318	.000	.455
	Epsilon-squared	.034	-.417	.228
	Omega-squared Fixed-effect	.032	-.385	.218
	Omega-squared Random-effect	.007	-.059	.053
Hari ke 12	Eta-squared	.652	.043	.737
	Epsilon-squared	.507	-.356	.627
	Omega-squared Fixed-effect	.493	-.329	.614
	Omega-squared Random-effect	.163	-.052	.241
Hari ke 14	Eta-squared	.626	.009	.717
	Epsilon-squared	.470	-.404	.599
	Omega-squared Fixed-effect	.456	-.373	.585
	Omega-squared Random-effect	.143	-.057	.220
Hari ke 16	Eta-squared	.993	.970	.994
	Epsilon-squared	.990	.958	.992
	Omega-squared Fixed-effect	.989	.955	.991
	Omega-squared Random-effect	.947	.810	.959
Hari ke 18	Eta-squared	.	.	.
	Epsilon-squared	.	.	.
	Omega-squared Fixed-effect	.	.	.
	Omega-squared Random-effect	.	.	.

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Multiple Comparisons

LSD

Dependent Variable	(I) Variasi	(J) Variasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Hari ke 8	V1	V2	-52.33333	47.10469	.288	-154.9656	50.2990
		V3	40.66667	47.10469	.405	-61.9656	143.2990
		V4	-57.66667	47.10469	.244	-160.2990	44.9656
		V5	-10.66667	47.10469	.825	-113.2990	91.9656
		V6	-63.33333	47.10469	.204	-165.9656	39.2990
		V6	-63.33333	47.10469	.204	-165.9656	39.2990
	V2	V1	52.33333	47.10469	.288	-50.2990	154.9656
		V3	93.00000	47.10469	.072	-9.6323	195.6323
		V4	-5.33333	47.10469	.912	-107.9656	97.2990
		V5	41.66667	47.10469	.394	-60.9656	144.2990
		V6	-11.00000	47.10469	.819	-113.6323	91.6323
	V3	V1	-40.66667	47.10469	.405	-143.2990	61.9656
		V2	-93.00000	47.10469	.072	-195.6323	9.6323
		V4	-98.33333	47.10469	.059	-200.9656	4.2990
		V5	-51.33333	47.10469	.297	-153.9656	51.2990
		V6	-104.00000*	47.10469	.047	-206.6323	-1.3677
	V4	V1	57.66667	47.10469	.244	-44.9656	160.2990
		V2	5.33333	47.10469	.912	-97.2990	107.9656
		V3	98.33333	47.10469	.059	-4.2990	200.9656
		V5	47.00000	47.10469	.338	-55.6323	149.6323
		V6	-5.66667	47.10469	.906	-108.2990	96.9656
	V5	V1	10.66667	47.10469	.825	-91.9656	113.2990
		V2	-41.66667	47.10469	.394	-144.2990	60.9656
		V3	51.33333	47.10469	.297	-51.2990	153.9656
		V4	-47.00000	47.10469	.338	-149.6323	55.6323
		V6	-52.66667	47.10469	.285	-155.2990	49.9656
	V6	V1	63.33333	47.10469	.204	-39.2990	165.9656
		V2	11.00000	47.10469	.819	-91.6323	113.6323
		V3	104.00000*	47.10469	.047	1.3677	206.6323
		V4	5.66667	47.10469	.906	-96.9656	108.2990
		V5	52.66667	47.10469	.285	-49.9656	155.2990
Hari ke 10	V1	V2	-3.66667	19.17946	.852	-45.4551	38.1218
		V3	27.33333	19.17946	.180	-14.4551	69.1218
		V4	-8.00000	19.17946	.684	-49.7885	33.7885
		V5	-9.00000	19.17946	.647	-50.7885	32.7885
		V6	-11.33333	19.17946	.566	-53.1218	30.4551
		V6	-11.33333	19.17946	.566	-53.1218	30.4551
	V2	V1	3.66667	19.17946	.852	-38.1218	45.4551
		V3	31.00000	19.17946	.132	-10.7885	72.7885
		V4	-4.33333	19.17946	.825	-46.1218	37.4551
		V5	-5.33333	19.17946	.786	-47.1218	36.4551
		V6	-7.66667	19.17946	.696	-49.4551	34.1218
	V3	V1	-27.33333	19.17946	.180	-69.1218	14.4551
		V2	-31.00000	19.17946	.132	-72.7885	10.7885
		V4	-35.33333	19.17946	.090	-77.1218	6.4551
		V5	-36.33333	19.17946	.083	-78.1218	5.4551
		V6	-38.66667	19.17946	.067	-80.4551	3.1218

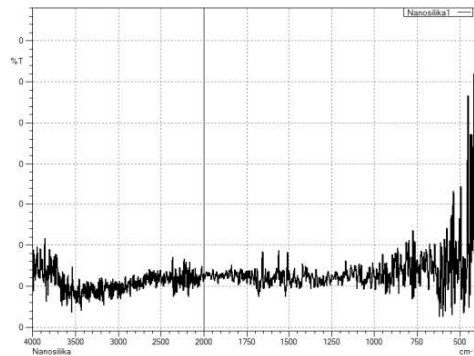
	V3	V1	-27.33333	19.17946	.180	-69.1218	14.4551
		V2	-31.00000	19.17946	.132	-72.7885	10.7885
		V4	-35.33333	19.17946	.090	-77.1218	6.4551
		V5	-36.33333	19.17946	.083	-78.1218	5.4551
		V6	-38.66667	19.17946	.067	-80.4551	3.1218
	V4	V1	8.00000	19.17946	.684	-33.7885	49.7885
		V2	4.33333	19.17946	.825	-37.4551	46.1218
		V3	35.33333	19.17946	.090	-6.4551	77.1218
		V5	-1.00000	19.17946	.959	-42.7885	40.7885
		V6	-3.33333	19.17946	.865	-45.1218	38.4551
	V5	V1	9.00000	19.17946	.647	-32.7885	50.7885
		V2	5.33333	19.17946	.786	-36.4551	47.1218
		V3	36.33333	19.17946	.083	-5.4551	78.1218
		V4	1.00000	19.17946	.959	-40.7885	42.7885
		V6	-2.33333	19.17946	.905	-44.1218	39.4551
	V6	V1	11.33333	19.17946	.566	-30.4551	53.1218
		V2	7.66667	19.17946	.696	-34.1218	49.4551
		V3	38.66667	19.17946	.067	-3.1218	80.4551
		V4	3.33333	19.17946	.865	-38.4551	45.1218
		V5	2.33333	19.17946	.905	-39.4551	44.1218
Hari ke 12	V1	V2	-2.00000	10.23610	.848	-24.3025	20.3025
		V3	-3.66667	10.23610	.726	-25.9692	18.6359
		V4	28.33333*	10.23610	.017	6.0308	50.6359
		V5	-11.66667	10.23610	.277	-33.9692	10.6359
		V6	-15.00000	10.23610	.169	-37.3025	7.3025
	V2	V1	2.00000	10.23610	.848	-20.3025	24.3025
		V3	-1.66667	10.23610	.873	-23.9692	20.6359
		V4	30.33333*	10.23610	.012	8.0308	52.6359
		V5	-9.66667	10.23610	.364	-31.9692	12.6359
		V6	-13.00000	10.23610	.228	-35.3025	9.3025
	V3	V1	3.66667	10.23610	.726	-18.6359	25.9692
		V2	1.66667	10.23610	.873	-20.6359	23.9692
		V4	32.00000*	10.23610	.009	9.6975	54.3025
		V5	-8.00000	10.23610	.450	-30.3025	14.3025
		V6	-11.33333	10.23610	.290	-33.6359	10.9692
	V4	V1	-28.33333*	10.23610	.017	-50.6359	-6.0308
		V2	-30.33333*	10.23610	.012	-52.6359	-8.0308
		V3	-32.00000*	10.23610	.009	-54.3025	-9.6975
		V5	-40.00000*	10.23610	.002	-62.3025	-17.6975
		V6	-43.33333*	10.23610	.001	-65.6359	-21.0308
	V5	V1	11.66667	10.23610	.277	-10.6359	33.9692
		V2	9.66667	10.23610	.364	-12.6359	31.9692
		V3	8.00000	10.23610	.450	-14.3025	30.3025
		V4	40.00000*	10.23610	.002	17.6975	62.3025
		V6	-3.33333	10.23610	.750	-25.6359	18.9692
	V6	V1	15.00000	10.23610	.169	-7.3025	37.3025
		V2	13.00000	10.23610	.228	-9.3025	35.3025
		V3	11.33333	10.23610	.290	-10.9692	33.6359
		V4	43.33333*	10.23610	.001	21.0308	65.6359
		V5	3.33333	10.23610	.750	-18.9692	25.6359

Hari ke 14	V1	V2	-1.00000	2.06380	.637	-5.4966	3.4966
		V3	-1.33333	2.06380	.530	-5.8300	3.1633
		V4	-2.66667	2.06380	.221	-7.1633	1.8300
		V5	2.00000	2.06380	.352	-2.4966	6.4966
		V6	-6.66667*	2.06380	.007	-11.1633	-2.1700
	V2	V1	1.00000	2.06380	.637	-3.4966	5.4966
		V3	-.33333	2.06380	.874	-4.8300	4.1633
		V4	-1.66667	2.06380	.435	-6.1633	2.8300
		V5	3.00000	2.06380	.172	-1.4966	7.4966
		V6	-5.66667*	2.06380	.018	-10.1633	-1.1700
	V3	V1	1.33333	2.06380	.530	-3.1633	5.8300
		V2	.33333	2.06380	.874	-4.1633	4.8300
		V4	-1.33333	2.06380	.530	-5.8300	3.1633
		V5	3.33333	2.06380	.132	-1.1633	7.8300
		V6	-5.33333*	2.06380	.024	-9.8300	-.8367
	V4	V1	2.66667	2.06380	.221	-1.8300	7.1633
		V2	1.66667	2.06380	.435	-2.8300	6.1633
		V3	1.33333	2.06380	.530	-3.1633	5.8300
		V5	4.66667*	2.06380	.043	.1700	9.1633
		V6	-4.00000	2.06380	.076	-8.4966	.4966
	V5	V1	-2.00000	2.06380	.352	-6.4966	2.4966
		V2	-3.00000	2.06380	.172	-7.4966	1.4966
		V3	-3.33333	2.06380	.132	-7.8300	1.1633
		V4	-4.66667*	2.06380	.043	-9.1633	-.1700
		V6	-8.66667*	2.06380	.001	-13.1633	-4.1700
	V6	V1	6.66667*	2.06380	.007	2.1700	11.1633
		V2	5.66667*	2.06380	.018	1.1700	10.1633
		V3	5.33333*	2.06380	.024	.8367	9.8300
		V4	4.00000	2.06380	.076	-.4966	8.4966
		V5	8.66667*	2.06380	.001	4.1700	13.1633
Hari ke 16	V1	V2	.00000	.19245	1.000	-.4193	.4193
		V3	.00000	.19245	1.000	-.4193	.4193
		V4	.00000	.19245	1.000	-.4193	.4193
		V5	-4.00000*	.19245	<.001	-4.4193	-3.5807
		V6	-5.33333*	.19245	<.001	-5.7526	-4.9140
	V2	V1	.00000	.19245	1.000	-.4193	.4193
		V3	.00000	.19245	1.000	-.4193	.4193
		V4	.00000	.19245	1.000	-.4193	.4193
		V5	-4.00000*	.19245	<.001	-4.4193	-3.5807
		V6	-5.33333*	.19245	<.001	-5.7526	-4.9140
	V3	V1	.00000	.19245	1.000	-.4193	.4193
		V2	.00000	.19245	1.000	-.4193	.4193
		V4	.00000	.19245	1.000	-.4193	.4193
		V5	-4.00000*	.19245	<.001	-4.4193	-3.5807
		V6	-5.33333*	.19245	<.001	-5.7526	-4.9140
	V4	V1	.00000	.19245	1.000	-.4193	.4193
		V2	.00000	.19245	1.000	-.4193	.4193
		V3	.00000	.19245	1.000	-.4193	.4193
		V5	-4.00000*	.19245	<.001	-4.4193	-3.5807
		V6	-5.33333*	.19245	<.001	-5.7526	-4.9140
	V5	V1	4.00000*	.19245	<.001	3.5807	4.4193
		V2	4.00000*	.19245	<.001	3.5807	4.4193
		V3	4.00000*	.19245	<.001	3.5807	4.4193
		V4	4.00000*	.19245	<.001	3.5807	4.4193
		V6	-1.33333*	.19245	<.001	-1.7526	-.9140
	V6	V1	5.33333*	.19245	<.001	4.9140	5.7526
		V2	5.33333*	.19245	<.001	4.9140	5.7526
		V3	5.33333*	.19245	<.001	4.9140	5.7526
		V4	5.33333*	.19245	<.001	4.9140	5.7526
		V5	1.33333*	.19245	<.001	.9140	1.7526

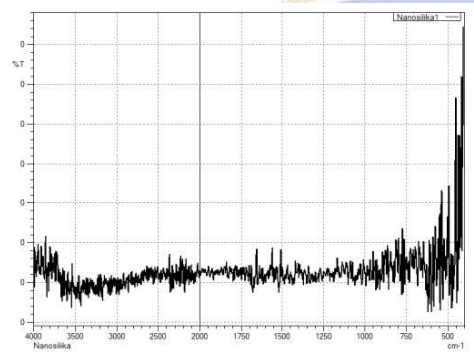
*, The mean difference is significant at the 0.05 level.

Lampiran 02f Hasil Uji *Fourier Transform Infrared Spectroscopy (FTIR)*

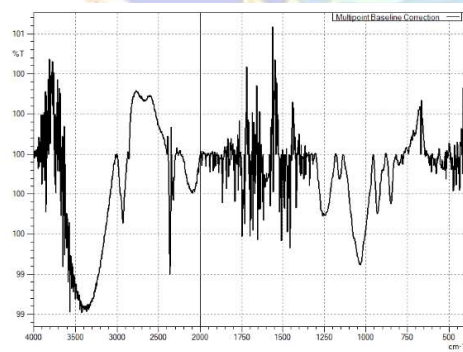
a) Nanosilika *baseline*



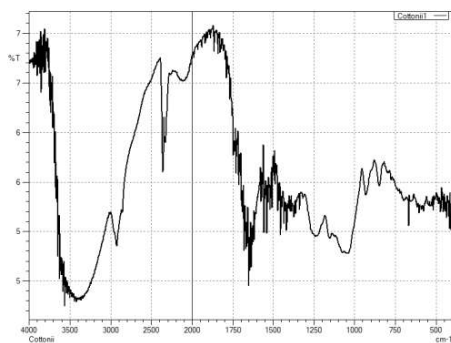
b) Nanosilika



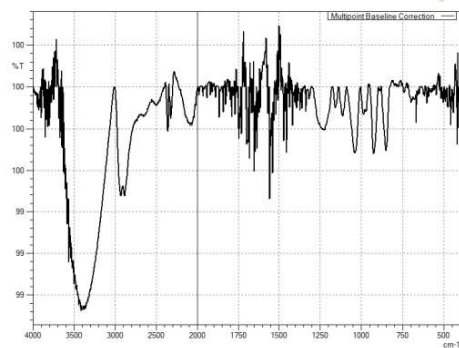
c) Tepung *Eucheumma cottonii* baseline



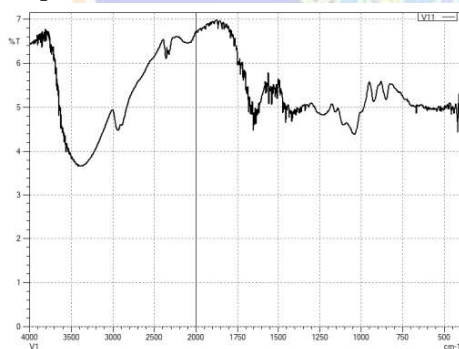
d) Tepung *Eucheumma cottonii*



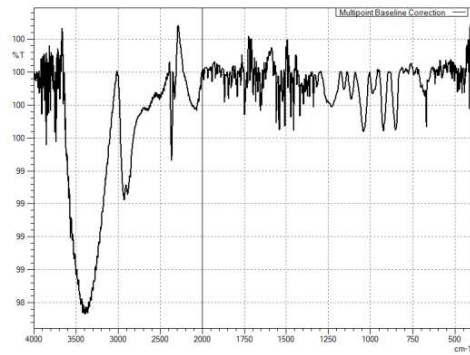
e) Bioplastik V1 *baseline*



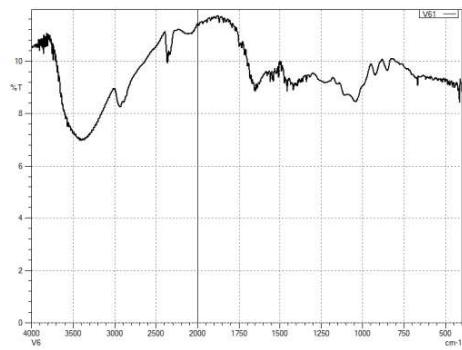
f) Bioplastik V1



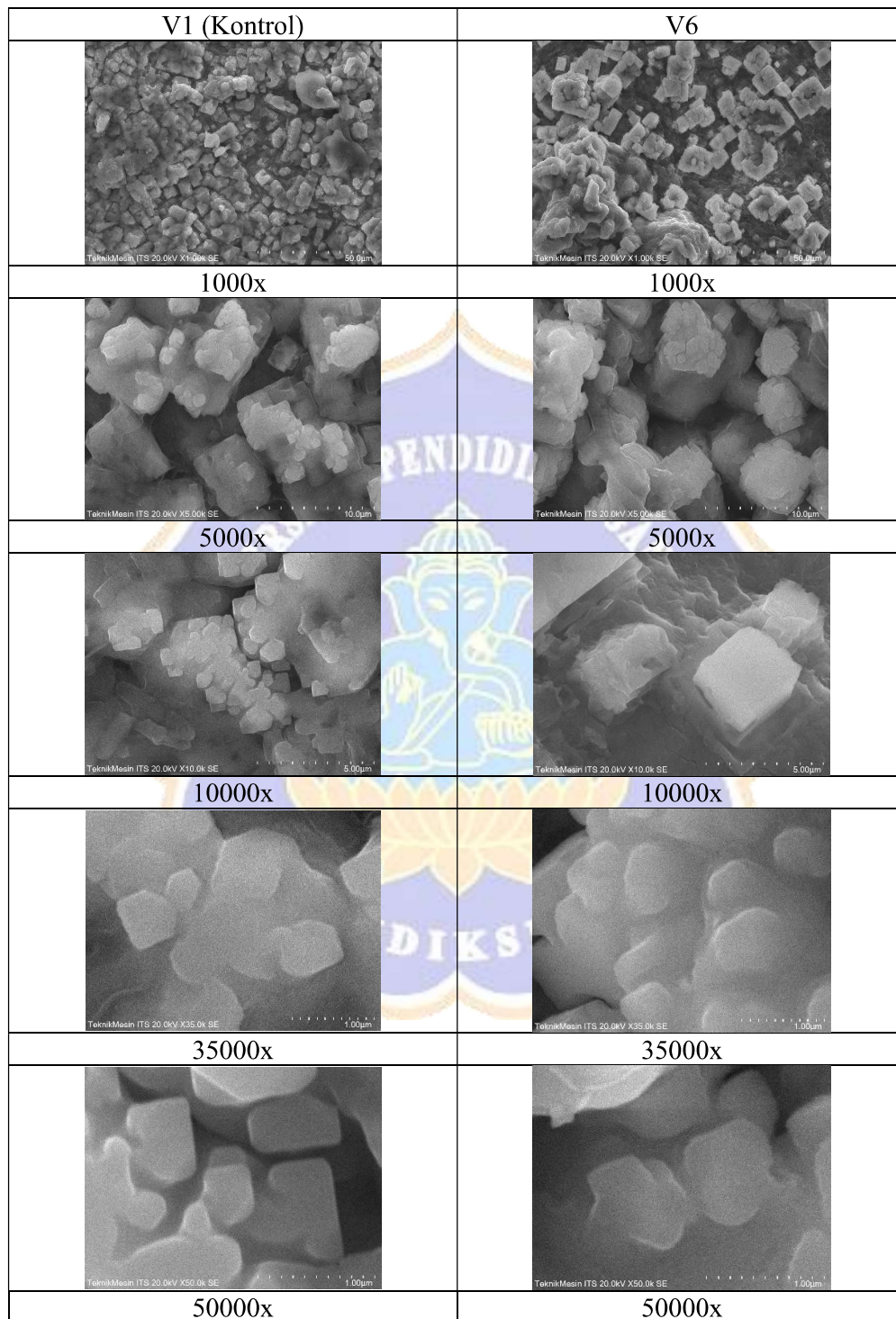
g) Bioplastik V6 *baseline*



h) Bioplastik V6



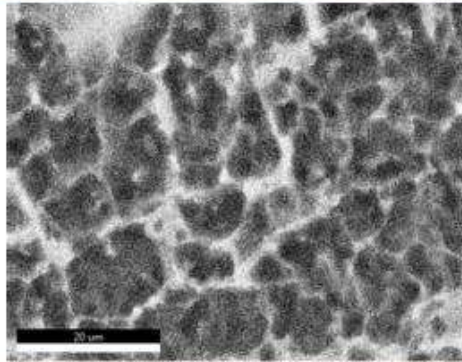
Lampiran 02g Hasil Uji *Scanning Electron Microscopy (SEM)*



03032025

Author: Teknik Mesin ITS
Creation: 03/09/2025 1:54:31 PM
Sample Name: Karyasa Undiksha

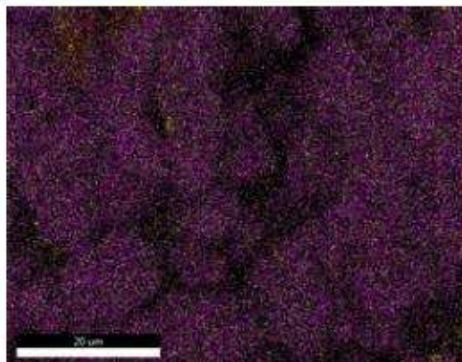
V1



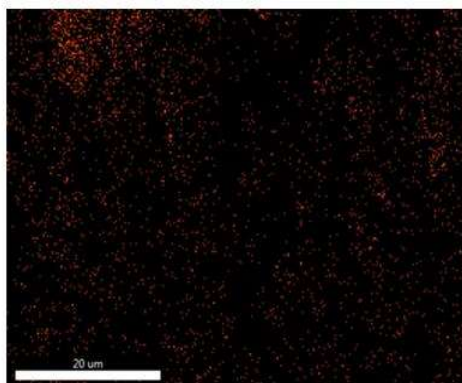
Image

PhaseROI 2

ElementOverlay

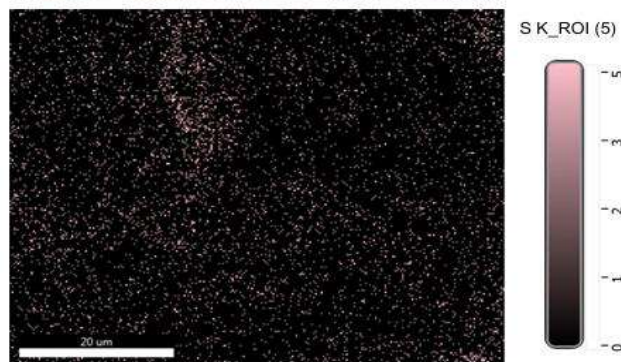
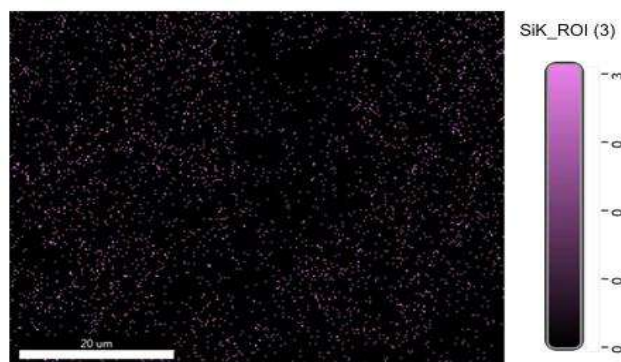
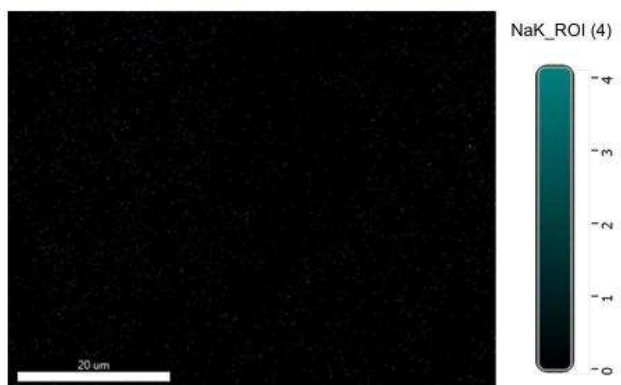
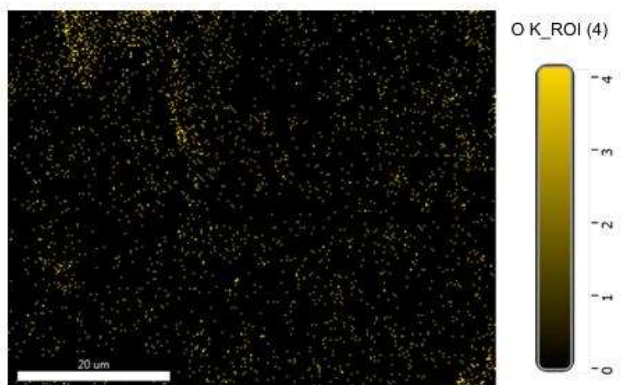


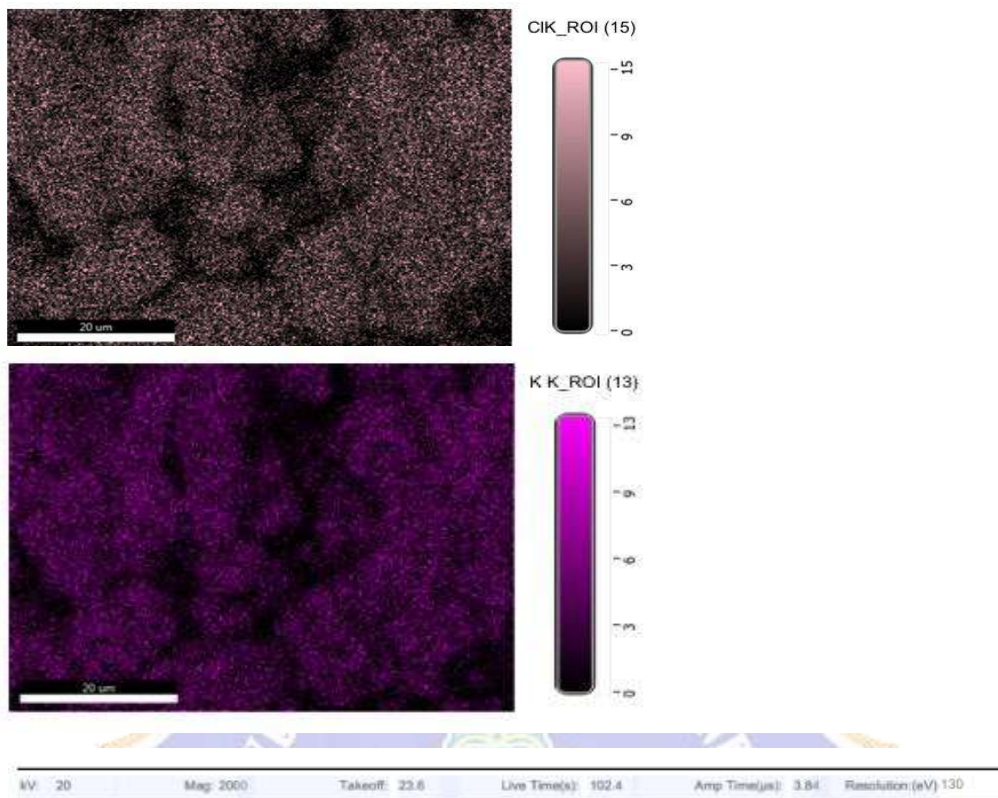
2% C K
2% O K
1% Na K
2% Si K
3% S K
52% Cl K
39% K K



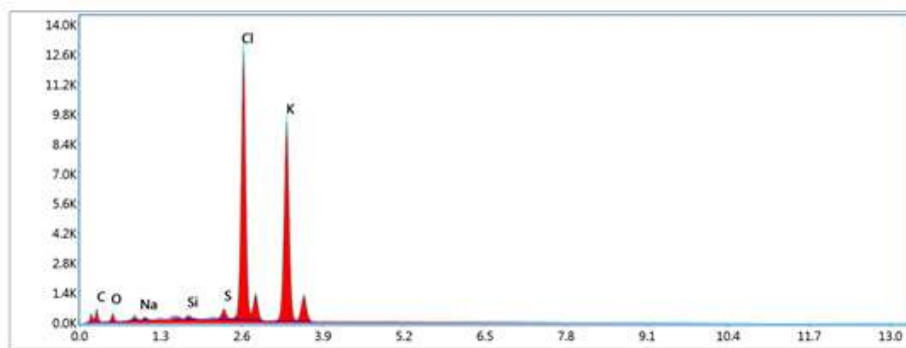
C K_ROI (5)







Sum Spectrum



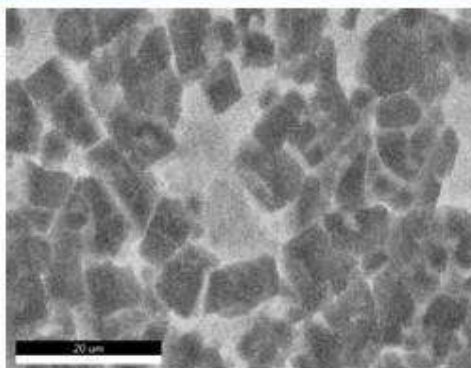
Smart Quant Results

Element	Weight %	Atomic %	Net Int.	Error %	Kratio	Z	A	F
C K	9.07	21.85	18.93	14.41	0.0102	1.1794	0.0950	1.0000
O K	6.83	12.36	23.09	13.36	0.0063	1.1325	0.0818	1.0000
Na K	0.77	0.97	11.24	16.64	0.0028	1.0320	0.3481	1.0020
Si K	0.45	0.48	18.75	11.58	0.0037	1.0354	0.7805	1.0114
S K	1.23	1.11	47.67	7.50	0.0119	1.0152	0.9305	1.0289
Cl K	37.53	30.62	1298.28	1.78	0.3538	0.9663	0.9604	1.0157
K K	44.12	32.64	1035.95	3.25	0.3451	0.9625	0.8118	1.0011

03032025

Author: Teknik Mesin ITS
Creation: 03/09/2025 1:55:07 PM
Sample Name: Karyasa Undiksha

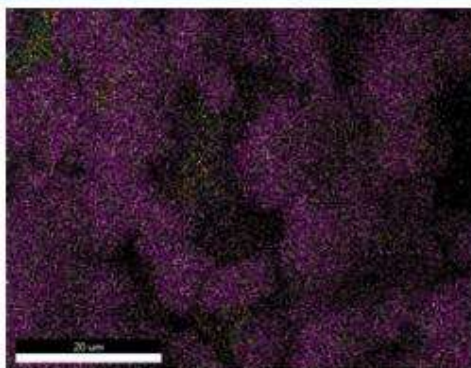
V6



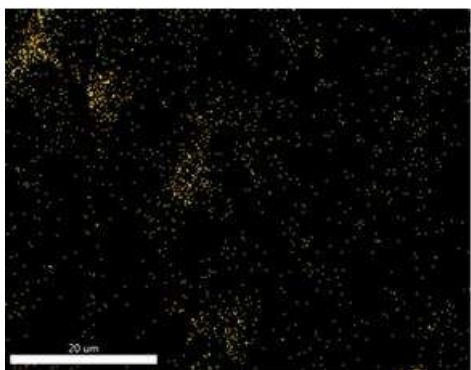
Image

PhaseROI 2

ElementOverlay

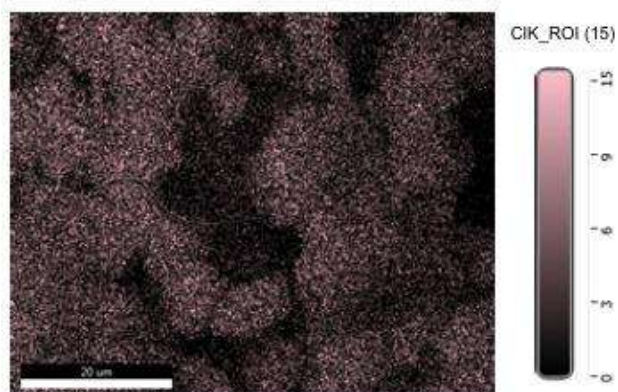
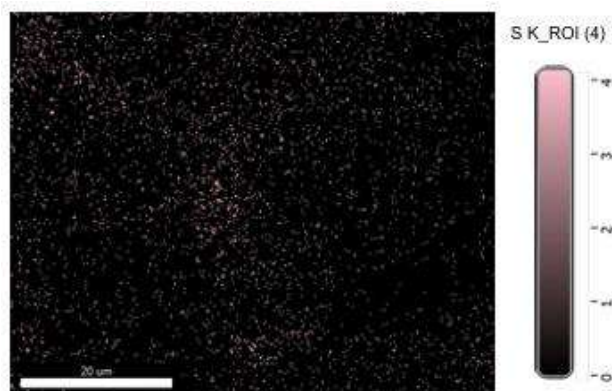
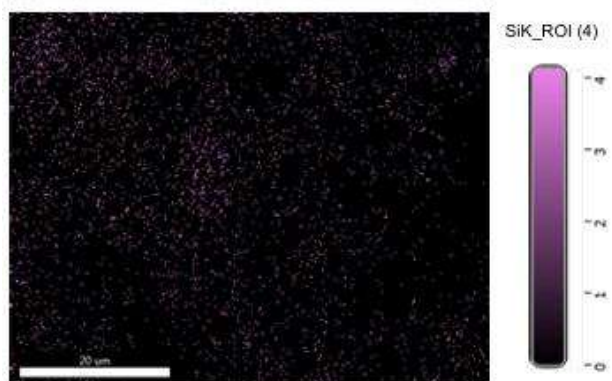
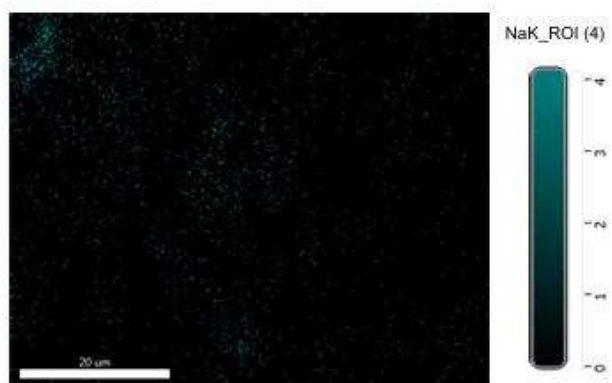


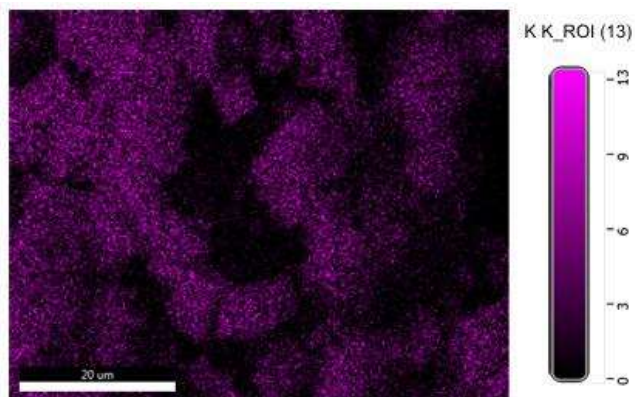
1% O K
1% NaK
2% SiK
2% S K
59% ClK
34% K K



O K_ROI (4)

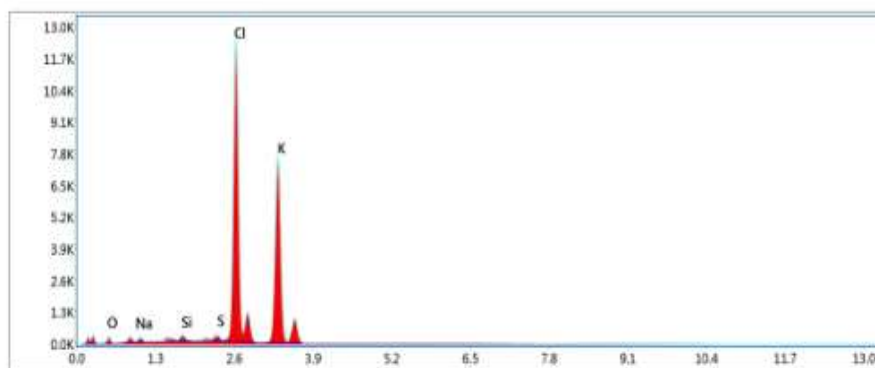






kV: 20 Mag: 3000 Takeoff: 23.6 Live Time(s): 102.4 Amp Time(μs): 3.84 Resolution(eV) 130

Sum Spectrum



Smart Quant Results

Element	Weight %	Atomic %	Net Int.	Error %	Kratio	Z	A	F
O K	5.82	12.46	15.16	15.24	0.0054	1.1585	0.0804	1.0000
NaK	0.98	1.46	11.16	15.27	0.0036	1.0562	0.3449	1.0020
SiK	0.63	0.77	20.62	10.79	0.0053	1.0600	0.7725	1.0115
S K	0.89	0.95	26.84	10.68	0.0088	1.0395	0.9229	1.0297
ClK	45.46	43.90	1228.68	1.79	0.4369	0.9894	0.9574	1.0145
K K	46.21	40.46	814.43	3.64	0.3541	0.9857	0.7766	1.0009

Lampiran 03 Riwayat Hidup

RIWAYAT HIDUP



Shallaputri Siehand lahir di Denpasar pada 06 Desember 2002. Penulis berkebangsaan Indonesia dan Beragama Islam. Saat ini penulis tinggal di Jalan Diponegoro Desa Dauh Puri, Kecamatan Denpasar Barat, Kabupaten Denpasar, Provinsi Bali.

Penulis menyelesaikan pendidikan dasar di SD Negeri 4 Kuta dan lulus pada tahun 2015. Kemudian penulis melanjutkan pendidikan sekolah menengah pertama di SMP Nasional Denpasar dan lulus pada tahun 2018. Pada tahun 2021 penulis lulus dari SMK Kesehatan PGRI Denpasar jurusan Farmasi dan melanjutkan pendidikan Sarjana di Program Studi Kimia, Jurusan Kimia, Universitas Pendidikan Ganesha. Pada semester terakhir pada tahun 2025 penulis telah menyelesaikan Skripsi yang berjudul "Pengaruh Nanosilika Abu Sekam Padi terhadap Sifat Fisika, Kimia, dan Biologi Bioplastik Berbahan Tepung Rumpun Laut dan Gliserol". Selanjutnya dimulai pada tahun 2021 hingga saat penulisan skripsi ini, penulis masih terdaftar sebagai mahasiswa Program S1 Kimia di Universitas Pendidikan Ganesha.

