

## DAFTAR PUSTAKA

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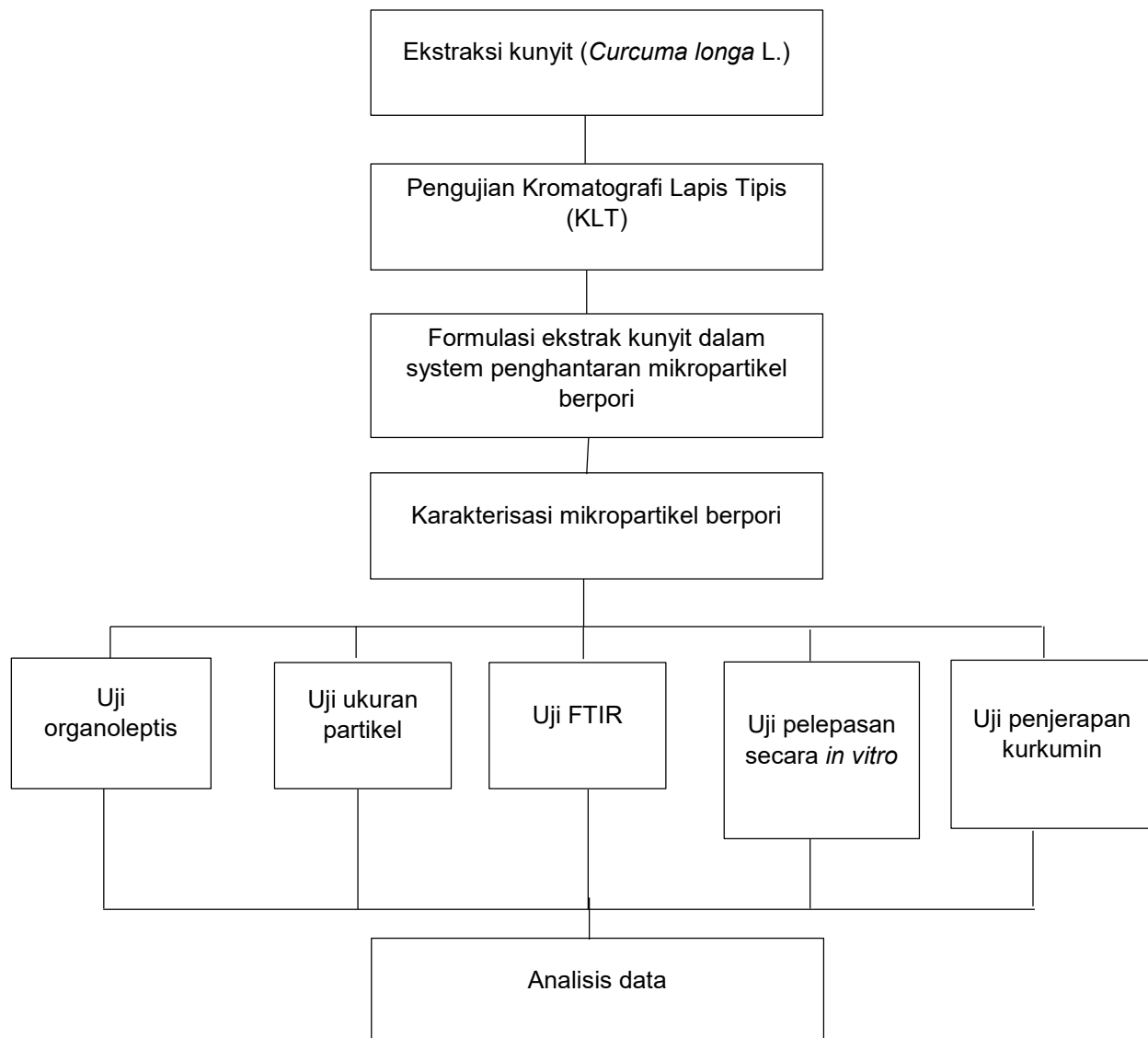
Yenying, A., Tangamatakul, K., Supanchart, C., Jenvoraphot, T., Manokruang, K., Worajittiphon, P., ... & Daranarong, D. (2022). Preparation and Characterization of PLG Microparticles by the Multiple Emulsion Method for the Sustained Release of Proteins. *Micromachines*, 13(10), 1761.

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## LAMPIRAN

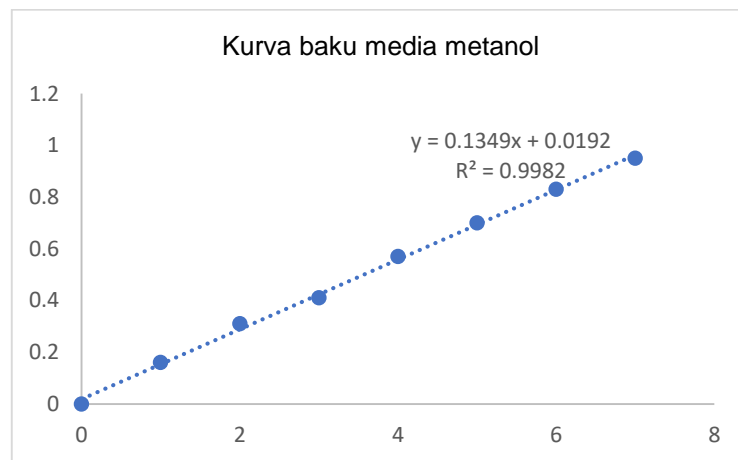
### Lampiran 1. Skema Kerja



## Lampiran 2. Hasil panjang gelombang maksimum dan kurva baku



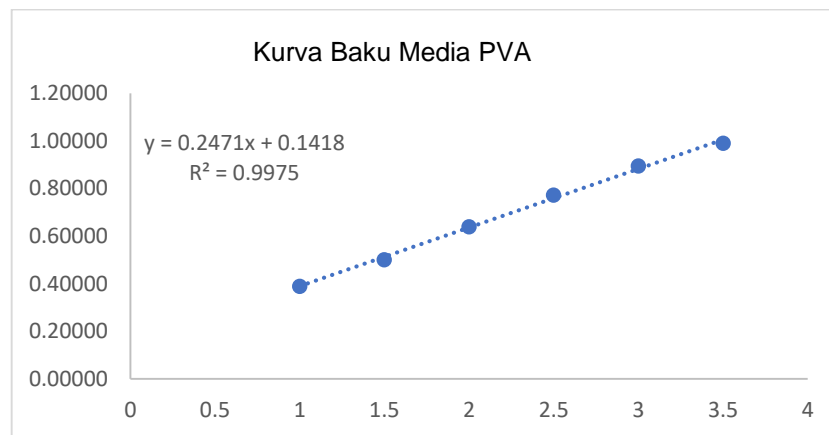
Gambar 13. Panjang gelombang maksimum kurkumin dalam metanol



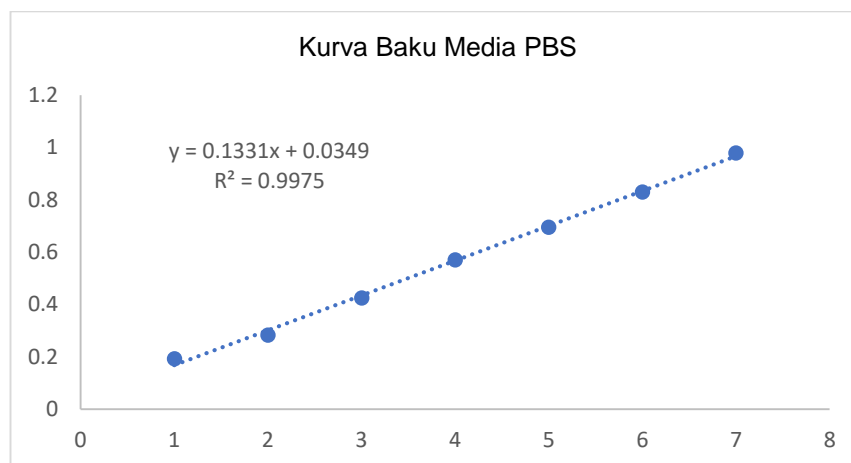
Gambar 14. Kurva baku kurkumin dalam metanol



Gambar 15. Panjang gelombang maksimum kurkumin dalam PVA 1%



**Gambar 16. Kurva baku kurkumin dalam PVA 1%**



**Gambar 17. Kurva baku kurkumin dalam PBS**

### Lampiran 3. Data LOD dan LOQ

Tabel 7. Data Penentuan LOD dan LOQ

Penentuan LOD dan LOQ				
b	0,1349	a	0,0192	
kons,	y avg	y'	y avg - y'	(y avg - y')^2
7	0,96	0,96	0,004	0,0000
6	0,83	0,82	0,002	0,0000
5	0,70	0,69	0,007	0,0000
4	0,57	0,55	0,013	0,0001
3	0,40	0,42	-0,015	0,0000
2	0,30	0,28	0,0116	0,0001
1	0,17	0,15	0,0159	0,0002
0	0	0,019	-0,019	0,0003
<b>avg</b>	3,5			0,0001
				0,00005
<b>Sy</b>	0,005			
<b>LOD</b>	0,125			
<b>LOQ</b>	0,380			
<b>Sxo</b>	0,038			
<b>Vxo</b>	1,085			
<b>LQC</b>	1,140			
<b>MQC</b>	3,5			
<b>HQC</b>	5,25			

### Lampiran 4. Analisis Statistik Ukuran Partikel dan Efisiensi Penjerapan

#### Lampiran 4.1 Analisis Statistik Ukuran Partikel

		Tests of Normality					
		Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Formulasi	Statistic	df	Sig.	Statistic	df	Sig.
Ukuran partikel	Formulasi 1 (0,3 PCL)	.160	10	.200*	.951	10	683
	Formulasi 2 (0,4 PCL)	.165	10	.200*	.949	10	653
	Formulasi 3 (0,5 PCL)	.189	10	.200*	.954	10	.710

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

### Test of Homogeneity of Variances

		Levene			
		Statistic	df1	df2	Sig.
Ukuran partikel	Based on Mean	9.047	2	27	.001
	Based on Median	9.006	2	27	.001
	Based on Median and with adjusted df	9.006	2	14.874	.003
	Based on trimmed mean	9.148	2	27	.001

### ANOVA

Ukuran partikel

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	202.091	2	101.045	149.638	.000
Within Groups	18.232	27	.675		
Total	220.323	29			

### Multiple Comparisons

Dependent Variable: Ukuran partikel

	(I) Formulasi	(J) Formulasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Formulasi 1 (0,3 PCL)	Formulasi 2 (0,4 PCL)	-2.10252*	.36750	.000	-3.0137	-1.1913
		Formulasi 3 (0,5 PCL)	-6.24724*	.36750	.000	-7.1584	-5.3361
	Formulasi 2 (0,4 PCL)	Formulasi 1 (0,3 PCL)	2.10252*	.36750	.000	1.1913	3.0137
		Formulasi 3 (0,5 PCL)	-4.14472*	.36750	.000	-5.0559	-3.2335
	Formulasi 3 (0,5 PCL)	Formulasi 1 (0,3 PCL)	6.24724*	.36750	.000	5.3361	7.1584
		Formulasi 2 (0,4 PCL)	4.14472*	.36750	.000	3.2335	5.0559

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



## Lampiran 4.2 Analisis Statistik Efisiensi Penjerapan

Tests of Normality							
	Formulasi	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Efisiensi Penjerapan	1.00	.356	3	.	.818	3	.157
	2.00	.328	3	.	.871	3	.298
	3.00	.314	3	.	.893	3	.363

a. Lilliefors Significance Correction

Test of Homogeneity of Variances					
		Levene	df1	df2	Sig.
		Statistic			
Efisiensi Penjerapan	Based on Mean	2.739	2	6	.143
	Based on Median	.248	2	6	.788
	Based on Median and with adjusted df	.248	2	3.516	.793
	Based on trimmed mean	2.283	2	6	.183

### Multiple Comparisons

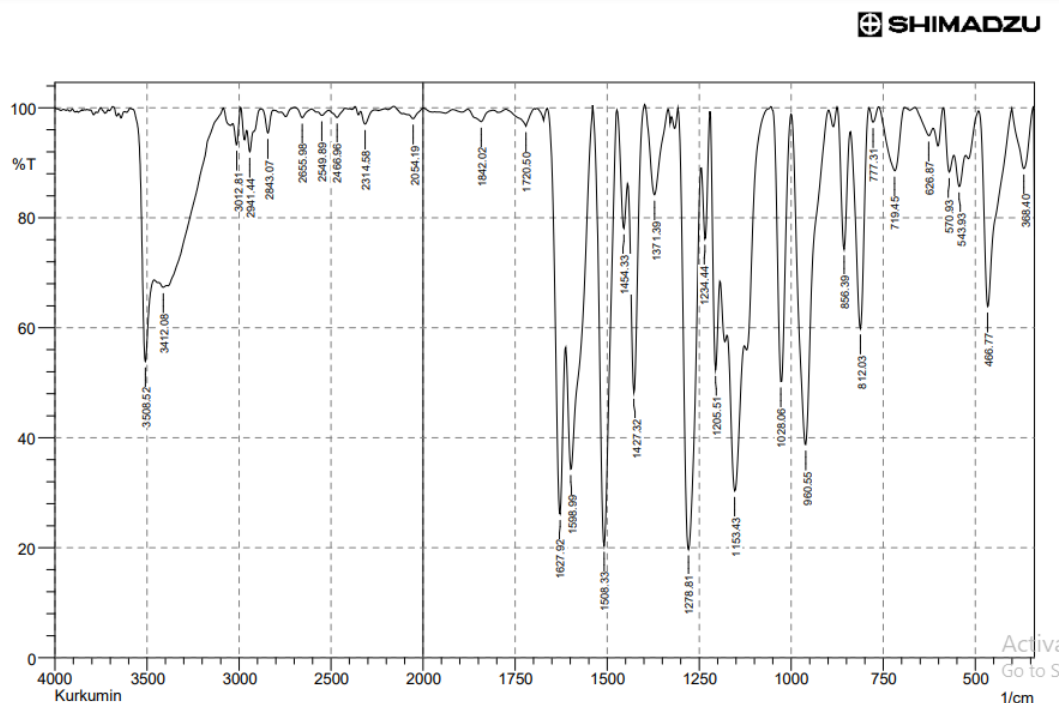
Dependent Variable: Efisiensi Penjerapan

	(I) Formulasi	(J) Formulasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	1.00	2.00	-2.25094*	.02145	.000	-2.3168	-2.1851
		3.00	-2.74680*	.02145	.000	-2.8126	-2.6810
	2.00	1.00	2.25094*	.02145	.000	2.1851	2.3168
		3.00	-.49586*	.02145	.000	-.5617	-.4301
	3.00	1.00	2.74680*	.02145	.000	2.6810	2.8126
		2.00	.49586*	.02145	.000	.4301	.5617

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

### Lampiran 5. Hasil Analisis FTIR

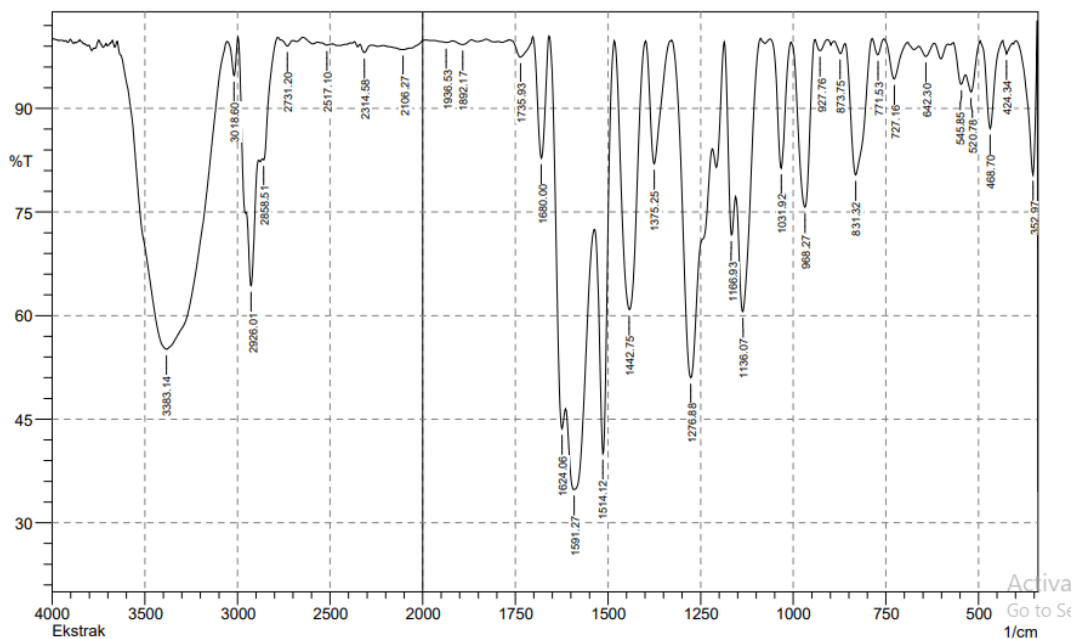
#### Lampiran 5.1 Hasil Analisis FTIR Kurkumin



No.	Peak	Intensity	Corr. Intensity	Base (H)	Base (L)	Area	Corr. Area
1	368.4	88.94	11.044	401.19	343.33	1.612	1.606
2	466.77	63.842	35.478	489.92	403.12	7.083	6.807
3	543.93	85.677	5.661	557.43	526.57	1.64	0.426
4	570.93	88.309	6.715	586.36	559.36	1.018	0.446
5	626.87	94.931	2.249	663.51	615.29	0.627	0.236
6	719.45	88.567	11.459	761.88	694.37	1.918	1.932
7	777.31	97.365	2.708	788.89	763.81	0.143	0.151
8	812.03	59.869	38.117	839.03	788.89	5.23	4.763
9	856.39	74.247	23.217	873.75	840.96	2.269	1.899
10	960.55	38.744	60.307	999.13	898.83	15.77	15.4
11	1028.06	50.255	49.249	1053.13	1001.06	6.226	6.102
12	1153.43	30.304	27.37	1172.72	1128.36	16.546	5.889
13	1205.51	52.34	29.903	1219.01	1193.94	4.791	2.483
14	1234.44	76.185	17.162	1244.09	1220.94	1.637	1.068
15	1278.81	19.707	74.84	1305.81	1246.02	20.166	18.493
16	1371.39	84.199	15.905	1396.46	1334.74	2.245	2.255
17	1427.32	48.194	42.737	1442.75	1398.39	6.102	4.752
18	1454.33	78.064	12.569	1473.62	1444.68	1.89	0.874
19	1508.33	20.322	78.775	1537.27	1475.54	17.005	16.76
20	1598.99	34.313	30.252	1612.49	1539.2	17.763	8.979
21	1627.92	26.137	42.231	1662.64	1614.42	12.606	6.545
22	1720.50	96.665	3.172	1774.51	1697.36	0.512	0.447
23	1842.02	97.48	2.17	1878.67	1811.16	0.406	0.305
24	2054.19	98.016	1.164	2083.12	2000.18	0.422	0.19
25	2314.58	97.037	2.396	2339.65	2260.57	0.528	0.351
26	2466.96	98.244	1.492	2513.25	2422.59	0.382	0.276
27	2549.89	98.61	0.744	2573.04	2513.25	0.251	0.093
28	2655.98	98.2	1.741	2698.41	2605.83	0.304	0.275
29	2843.07	95.405	4.269	2877.79	2814.14	0.565	0.477
30	2941.44	92	4.618	2956.87	2877.79	1.319	0.598
31	3012.81	93.252	5.337	3034.03	2991.59	0.758	0.494
32	3412.08	67.359	0.543	3435.22	3394.72	6.874	0.072
33	3508.52	53.86	26.001	3591.46	3462.22	14.795	5.437

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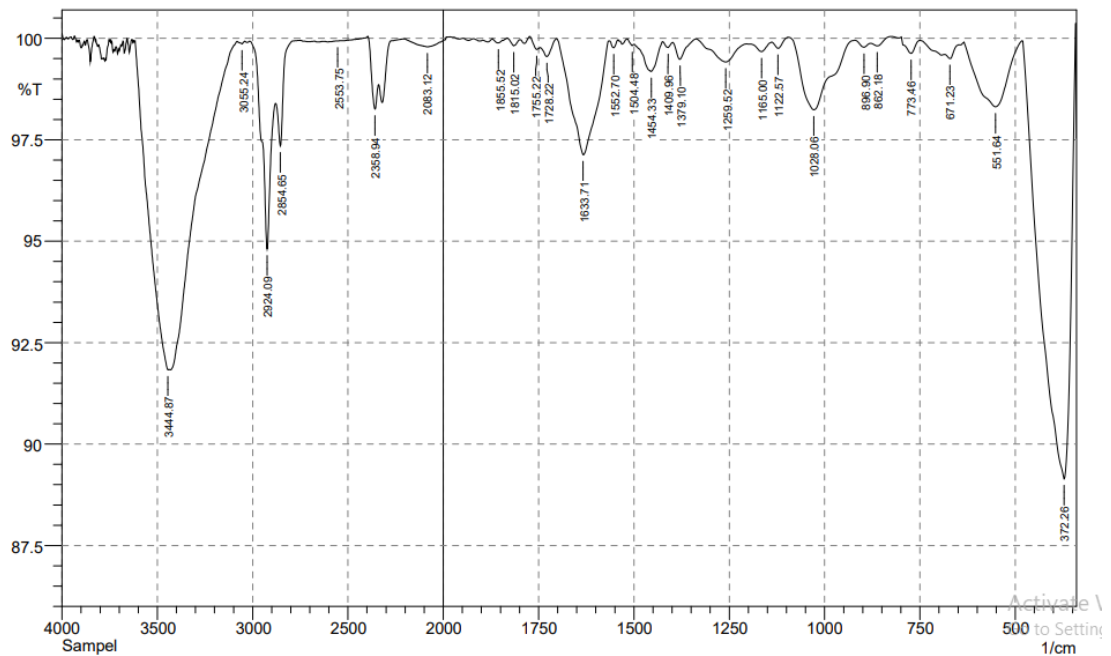


No.	Peak	Intensity	Corr. Intensity	Base (H)	Base (L)	Area	Corr. Area
1	352.97	80.425	17.181	397.34	343.33	2.109	1.73
2	424.34	97.894	1.799	433.98	406.98	0.14	0.097
3	468.7	87.094	12.669	495.71	435.91	1.42	1.358
4	520.78	92.391	4.175	534.28	495.71	0.819	0.355
5	545.85	93.502	2.993	567.07	534.28	0.651	0.239
6	642.3	97.519	1.678	661.58	619.15	0.297	0.152
7	727.16	94.283	5.577	756.1	690.52	0.747	0.699
8	771.53	97.76	2.343	786.96	756.1	0.145	0.158
9	831.32	80.394	19.193	858.32	786.96	3.682	3.59
10	873.75	97.961	1.582	891.11	860.25	0.158	0.099
11	927.76	98.349	1.621	941.26	906.54	0.13	0.126
12	968.27	75.698	24.024	1004.91	943.19	3.82	3.74
13	1031.92	81.347	18.456	1060.85	1006.84	1.97	1.925
14	1136.07	60.577	22.633	1153.43	1089.78	7.4	3.905
15	1166.93	71.679	14.335	1184.29	1155.36	2.879	1.1
16	1276.88	51.002	41.567	1327.03	1219.01	15.995	11.846
17	1375.25	81.995	17.823	1398.39	1328.95	2.654	2.606
18	1442.75	60.869	38.739	1481.33	1400.32	9.172	9.035
19	1514.12	40.028	43.587	1535.34	1483.26	9.845	6.326
20	1591.27	34.809	19.494	1614.42	1537.27	25.981	7.97
21	1624.06	43.623	12.97	1656.85	1616.35	8.384	1.597
22	1680	82.799	17.539	1701.22	1658.78	1.752	1.815
23	1735.93	97.428	2.635	1759.08	1703.14	0.358	0.385
24	1892.17	99.263	0.604	1917.24	1869.02	0.102	0.073
25	1936.53	99.546	0.26	1969.32	1917.24	0.072	0.031
26	2106.27	98.522	0.318	2212.35	2067.69	0.78	0.101
27	2314.58	98.101	1.138	2339.65	2276	0.362	0.147
28	2517.1	99.169	0.263	2567.25	2488.17	0.218	0.034
29	2731.2	99.035	0.978	2781.35	2700.34	0.136	0.16
30	2858.51	82.558	1.392	2864.29	2783.28	2.753	0.134
31	2926.01	64.305	13.723	2953.02	2887.44	9.322	2.509
32	3018.6	94.767	5.321	3055.24	2997.38	0.596	0.597
33	3383.14	55.132	44.574	3649.32	3057.17	84.844	84.079

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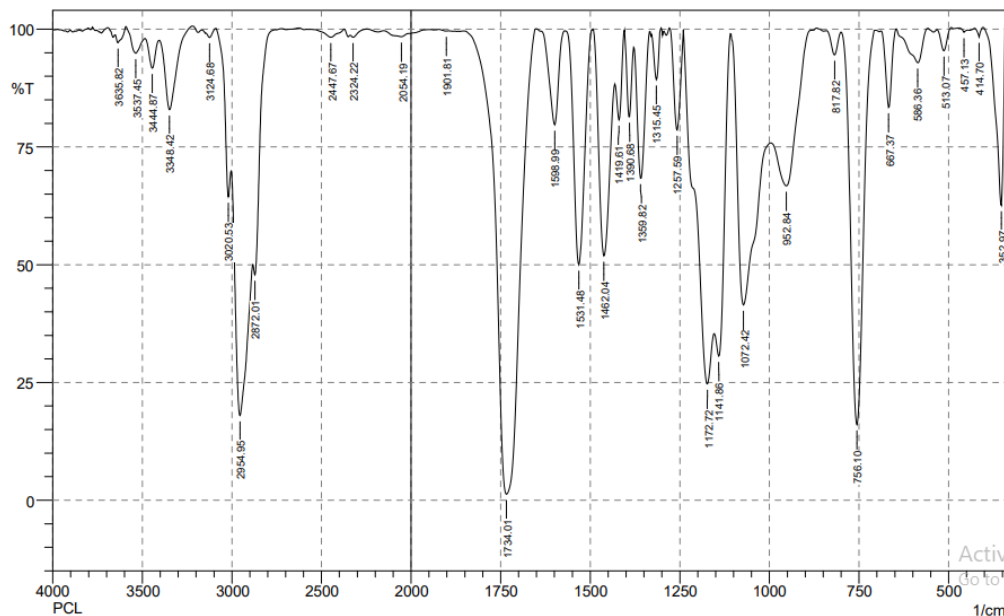


No.	Peak	Intensity	Corr. Intensity	Base (H)	Base (L)	Area	Corr. Area
1	372.26	89.146	10.525	480.28	343.33	4.176	4.036
2	551.64	98.313	1.61	634.58	482.2	0.66	0.609
3	671.23	99.5	0.189	684.73	648.08	0.057	0.013
4	773.46	99.626	0.363	798.53	750.31	0.044	0.042
5	862.18	99.813	0.119	879.54	825.53	0.021	0.012
6	896.9	99.781	0.129	920.05	879.54	0.026	0.011
7	1028.06	98.242	1.757	1095.57	920.05	0.641	0.634
8	1122.57	99.755	0.196	1139.93	1095.57	0.024	0.017
9	1165	99.673	0.21	1197.79	1139.93	0.054	0.023
10	1259.52	99.419	0.496	1336.67	1203.58	0.185	0.142
11	1379.1	99.486	0.44	1398.39	1336.67	0.065	0.05
12	1409.96	99.775	0.132	1425.4	1398.39	0.019	0.008
13	1454.33	99.182	0.713	1500.62	1425.4	0.153	0.116
14	1504.48	99.822	0.06	1517.98	1500.62	0.009	0.002
15	1552.7	99.766	0.186	1566.2	1541.12	0.015	0.01
16	1633.71	97.13	2.835	1703.14	1566.2	0.93	0.91
17	1728.22	99.553	0.31	1745.58	1703.14	0.05	0.028
18	1755.22	99.723	0.139	1774.51	1745.58	0.02	0.008
19	1815.02	99.818	0.167	1832.38	1799.59	0.014	0.012
20	1855.52	99.886	0.11	1870.95	1832.38	0.01	0.01
21	2083.12	99.792	0.221	2208.49	1992.47	0.121	0.129
22	2358.94	98.256	1.013	2395.59	2339.65	0.255	0.121
23	2553.75	99.934	0.005	2561.47	2542.18	0.005	0
24	2854.65	97.348	1.458	2879.72	2785.21	0.429	0.084
25	2924.09	94.81	4.07	3014.74	2881.65	1.266	0.778
26	3055.24	99.865	0.061	3082.25	3041.74	0.018	0.005
27	3444.87	91.828	0.273	3616.53	3439.08	3.975	0.632

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Lampiran 5.4 Hasil Analisis FTIR Polikaprolakton



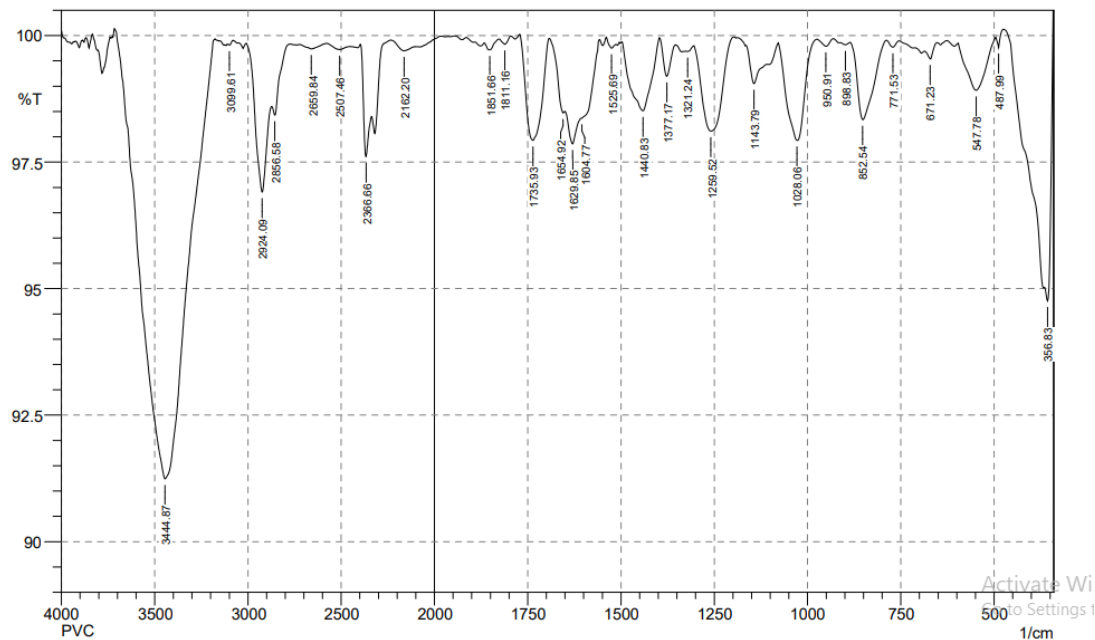
No.	Peak	Intensity	Corr. Intensity	Base (H)	Base (L)	Area	Corr. Area
1	352.97	62.605	34.211	403.12	343.33	4.438	3.958
2	414.7	98.347	1.941	426.27	403.12	0.041	0.07
3	457.13	99.32	0.663	472.56	447.49	0.016	0.02
4	513.07	95.407	4.705	532.35	493.78	0.36	0.379
5	586.36	92.875	7.251	646.15	559.36	1.398	1.437
6	667.37	83.38	16.379	686.66	648.08	1.418	1.379
7	756.1	16.084	83.413	798.53	707.88	23.672	23.48
8	817.82	94.535	4.967	840.96	800.46	0.502	0.418
9	952.84	66.725	17.38	995.27	869.9	11.602	4.63
10	1072.42	41.452	50.191	1107.14	997.2	23.224	16.26
11	1141.86	30.587	21.379	1153.43	1109.07	12.946	3.532
12	1172.72	24.676	23.799	1240.23	1155.36	27.082	7.411
13	1257.59	78.642	19.777	1276.88	1242.16	2.06	1.831
14	1315.45	89.306	10.272	1328.95	1301.95	0.677	0.627
15	1359.82	68.354	28.945	1377.17	1334.74	3.747	3.318
16	1390.68	81.384	16.435	1404.18	1379.1	1.311	1.069
17	1419.61	80.747	12.648	1431.18	1406.11	1.511	0.846
18	1462.04	51.884	41.937	1490.97	1433.11	9.145	7.438
19	1531.48	49.998	49.854	1570.06	1492.9	8.872	8.824
20	1598.99	79.717	19.898	1635.64	1571.99	2.71	2.602
21	1734.01	1.267	98.63	1851.66	1651.07	76.858	76.734
22	1901.81	99.619	0.097	1923.03	1896.03	0.03	0.006
23	2054.19	98.415	0.824	2154.49	2015.61	0.687	0.309
24	2324.22	98.287	0.634	2339.65	2245.14	0.312	0.052
25	2447.67	98.29	1.681	2555.68	2372.44	0.618	0.591
26	2872.01	47.859	5.952	2881.65	2760.14	11.289	0.668
27	2954.95	17.971	43.782	3003.17	2883.58	57.702	30.181
28	3020.53	64.419	11.091	3088.03	3005.1	6.591	1.181
29	3124.68	98.24	1.327	3147.83	3089.96	0.241	0.157
30	3348.42	82.917	15.66	3406.29	3221.12	5.618	4.927
31	3444.87	91.712	6.104	3485.37	3408.22	1.726	0.988
32	3537.45	94.893	4.326	3591.46	3487.3	1.356	1.008
33	3635.82	97.148	2.154	3653.18	3593.38	0.459	0.372

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No. of Scans:

A  
G

### Lampiran 5.5 Hasil Analisis FTIR Polivinil Alkohol



No.	Peak	Intensity	Corr. Intensity	Base (H)	Base (L)	Area	Corr. Area
1	356.83	94.757	2.452	366.48	341.4	0.435	0.196
2	487.99	99.766	0.259	495.71	474.49	0.003	0.008
3	547.78	98.92	0.986	596	495.71	0.281	0.241
4	671.23	99.54	0.226	686.66	651.94	0.048	0.014
5	771.53	99.77	0.132	788.89	754.17	0.024	0.009
6	852.54	98.34	1.539	887.26	788.89	0.368	0.319
7	898.83	99.819	0.044	914.26	887.26	0.019	0.003
8	950.91	99.79	0.146	974.05	931.62	0.026	0.014
9	1028.06	97.928	1.964	1078.21	974.05	0.489	0.441
10	1143.79	99.051	0.615	1165	1109.07	0.158	0.065
11	1259.52	98.113	1.758	1303.88	1197.79	0.503	0.451
12	1321.24	99.687	0.03	1327.03	1303.88	0.028	0.002
13	1377.17	99.194	0.694	1398.39	1354.03	0.085	0.063
14	1440.83	98.513	1.408	1496.76	1398.39	0.415	0.378
15	1525.69	99.751	0.141	1539.2	1514.12	0.02	0.009
16	1604.77	98.366	0.061	1606.7	1556.55	0.235	0.048
17	1629.85	97.857	0.58	1651.07	1606.7	0.356	0.052
18	1654.92	98.472	0.168	1691.57	1651.07	0.137	-0.001
19	1735.93	97.929	2.061	1772.58	1691.57	0.43	0.425
20	1811.16	99.828	0.134	1826.59	1795.73	0.015	0.01
21	1851.66	99.718	0.166	1867.09	1826.59	0.033	0.014
22	2162.2	99.699	0.142	2233.57	2102.41	0.128	0.04
23	2366.66	97.61	1.483	2397.52	2337.72	0.41	0.179
24	2507.46	99.726	0.083	2578.83	2455.38	0.123	0.023
25	2659.84	99.738	0.096	2723.49	2578.83	0.134	0.03
26	2856.68	98.43	0.358	2872.01	2771.71	0.336	-0.008
27	2924.09	96.907	2.154	3008.95	2873.94	1.031	0.567
28	3099.61	99.812	0.041	3109.25	3078.39	0.02	0.003
29	3444.87	91.242	8.788	3714.9	3178.69	10.894	10.965

Comment;

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### Lampiran 6. Hasil uji pelepasan secara *in vitro*

Tabel 8. Uji pelepasan formula 3 mikropartikel berpori ekstrak kunyit secara *in vitro*.

Waktu (Jam)	Abs	Konsentrasi ( $\mu\text{g/ml}$ )	1,5 ml ( $\mu\text{g}$ )	Faktor koreksi	Kurkumin yang terlepas (mg)	%Pelepasan	SD
0,25	0,129	0,931	0,931	0	0,093	1,552	0,051
	0,134	0,985	0,985	0	0,098	1,641	
	0,134	0,985	0,985	0	0,098	1,641	
0,5	0,137	1,017	1,017	0,001	0,102	1,712	0,052
	0,142	1,070	1,070	0,001	0,108	1,802	
	0,142	1,070	1,070	0,001	0,108	1,802	
0,75	0,149	1,145	1,145	0,002	0,116	1,945	0,073
	0,156	1,220	1,220	0,002	0,124	2,072	
	0,156	1,220	1,220	0,002	0,124	2,072	
1	0,163	1,295	1,295	0,003	0,133	2,216	0,032
	0,166	1,327	1,327	0,003	0,136	2,273	
	0,166	1,327	1,327	0,003	0,136	2,273	
2	0,18	1,477	1,477	0,004	0,152	2,544	0,066
	0,185	1,531	1,531	0,005	0,158	2,637	
	0,187	1,552	1,552	0,005	0,160	2,673	
3	0,193	1,616	1,616	0,006	0,168	2,803	0,054
	0,198	1,670	1,670	0,006	0,173	2,897	
	0,198	1,670	1,670	0,006	0,173	2,897	
4	0,207	1,766	1,766	0,008	0,184	3,082	0,047
	0,21	1,798	1,798	0,008	0,188	3,141	
	0,212	1,820	1,820	0,008	0,190	3,177	

<b>5</b>	0,228	1,991	1,991	0,010	0,209	3,490	0,048
	0,23	2,012	2,012	0,010	0,211	3,531	
	0,233	2,044	2,044	0,010	0,215	3,586	
<b>6</b>	0,235	2,066	2,066	0,012	0,219	3,650	0,034
	0,238	2,098	2,098	0,012	0,222	3,709	
	0,238	2,098	2,098	0,012	0,222	3,710	
<b>7</b>	0,245	2,173	2,173	0,014	0,231	3,864	0,034
	0,248	2,205	2,205	0,014	0,235	3,924	
	0,248	2,205	2,205	0,015	0,235	3,926	
<b>8</b>	0,271	2,451	2,451	0,017	0,262	4,369	0,049
	0,273	2,473	2,473	0,017	0,264	4,412	
	0,276	2,505	2,505	0,017	0,268	4,467	
<b>24</b>	0,406	3,897	3,897	0,020	0,410	6,843	0,044
	0,406	3,897	3,897	0,021	0,411	6,850	
	0,41	3,940	3,940	0,021	0,415	6,924	



Tabel 9. Data uji pelepasan *korsmeyer-peppas*

Best-fit Values				
Parameter	No.1	Mean	SD	RSD(%)
kKP	2,038	2,038		
n	0,367	0,367		

**DD Solver 1.0**      *Dissolution Data Modeling of Korsmeyer-Peppas Model*

Time Unit	h	Analyst	Administrator
Model	Korsmeyer-Peppas	Date	2023-3-13
Equation	$F=kKP*t^n$	Time	9:24:11

**Goodness of Fit**

Parameter	No.1				
N_observed	12				
DF	10				
R_obs-pre	0.9872				
Rsqr	0.9728				
Rsqr_adj	0.9701				
MSE	0.0627				
MSE_root	0.2505				
Weighting	1				
SS	0.6273				
WSS	0.6273				
AIC	-1.5953				
MSC	3.2721				

## Lampiran 7. Contoh perhitungan

### Lampiran 7.1 Larutan stok kurkumin

Perhitungan larutan stok kurkumin konsentrasi 1000 ppm dalam 10 mL labu tentukur.

Diketahui :

Volume labu tentukur 10 mL

Konsentrasi yang akan dibuat 1000 ppm

Ditanya :

Berapa bobot (mg) kurkumin yang akan ditimbang?

Penyelesaian :

$$M \text{ (ppm)} = \frac{\text{Bobot kurkumin } (\mu\text{g})}{\text{volume pelarut (mL)}}$$

$$1000 \text{ (ppm)} = \frac{\text{Bobot kurkumin } (\mu\text{g})}{10 \text{ mL}}$$

$$\text{Bobot kurkumin} = 10.000 \mu\text{g} = 10 \text{ mg}$$

### Lampiran 7.2 Seri Pengenceran

Perhitungan pembuatan larutan 7 ppm sebanyak 1 mL dari stok 1000 ppm

Diketahui:

Konsentrasi larutan stok 1000 ppm

Konsentrasi yang ingin dibuat 7 ppm sebanyak 1 mL

Ditanyakan:

Berapa larutan yang cuplik dari stok?

Penyelesaian:

Rumus pengenceran:  $v_1m_1 = v_2m_2$

$$1000 \text{ ppm} \times v_1 = 7 \text{ ppm} \times 1 \text{ mL}$$

$$v_1 = 70 \mu\text{L} \text{ (larutan yang dicuplik dari stok)} + 930 \mu\text{L} \text{ (pelarut)}$$

### Lampiran 7.3 Perhitungan Nilai Rf

Perhitungan nilai Rf pada lempeng kromatografi lapis tipis.

Diketahui:

Jarak bercak (komponen senyawa) 2,5 cm dari batas bawah lempeng

Jarak tempuh eluen 5,5 cm

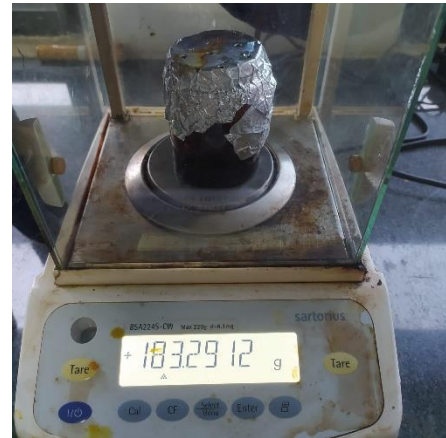
Ditanyakan:

Nilai Rf=...?

$$\begin{aligned}\text{Penyelesaian: Rf} &= \frac{\text{Jarak tempuh noda (cm)}}{\text{Jarak tempuh eluen (cm)}} \\ &= 2,5/5,5 = 0,45\end{aligned}$$

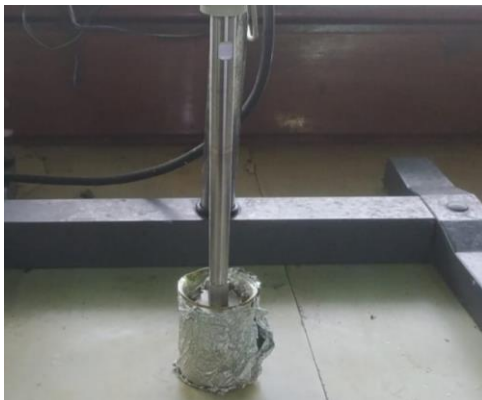
**Lampiran 8. Dokumentasi Penelitian**

(a)

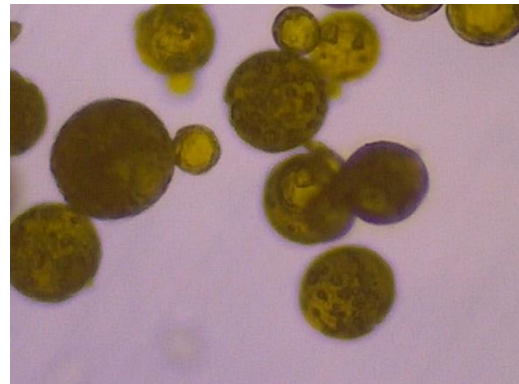


(b)

**Gambar 18. Penyiapan ekstrak kunyit (a) pengeringan rimpang kunyit (b) penimbangan bobot ekstrak kurkumin**



**Gambar 19. Formulasi mikropartikel proses pencampuran**



**Gambar 20. Mikropartikel berpori kunyit (mikroskop optik Olympus®)**