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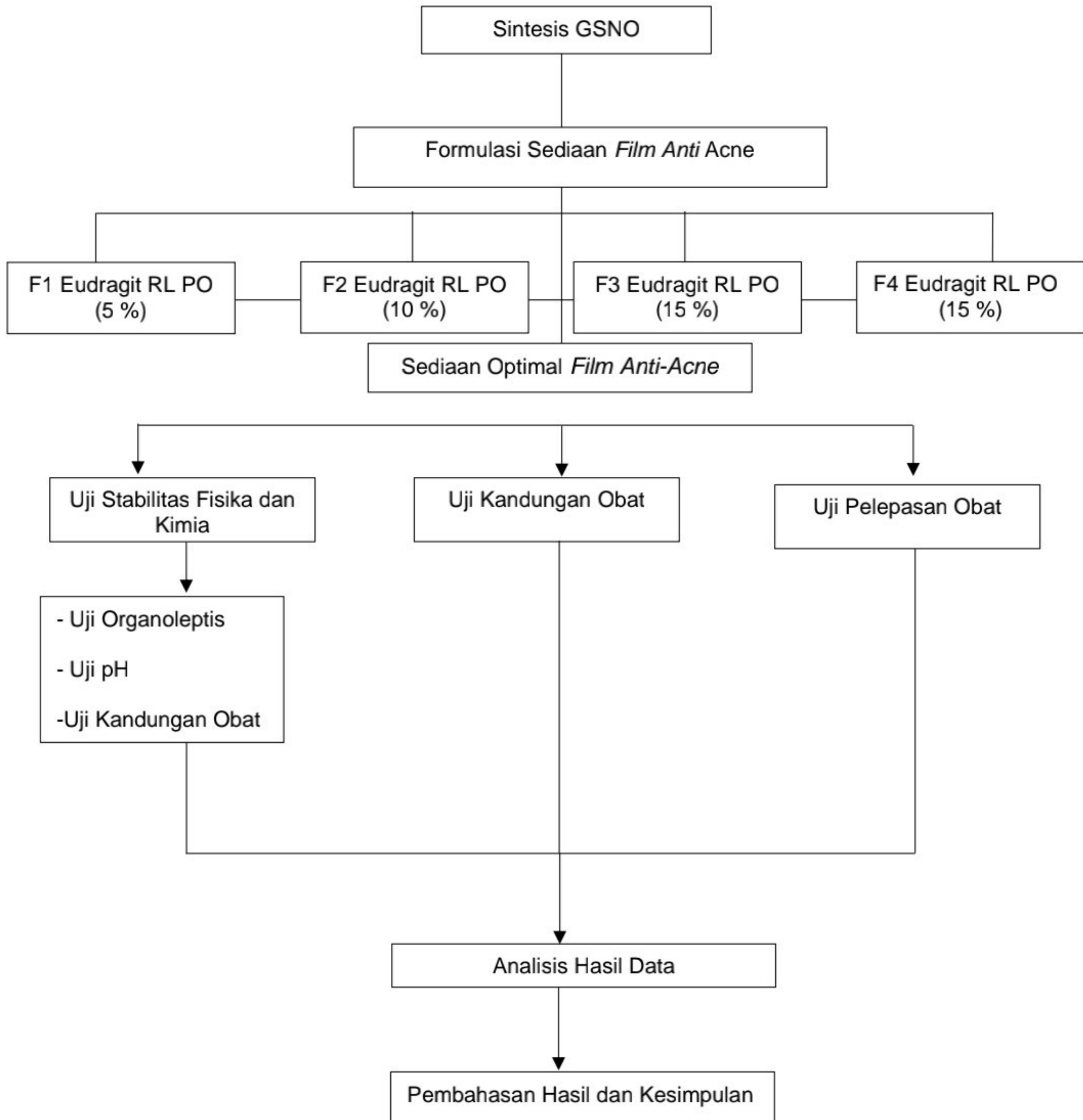
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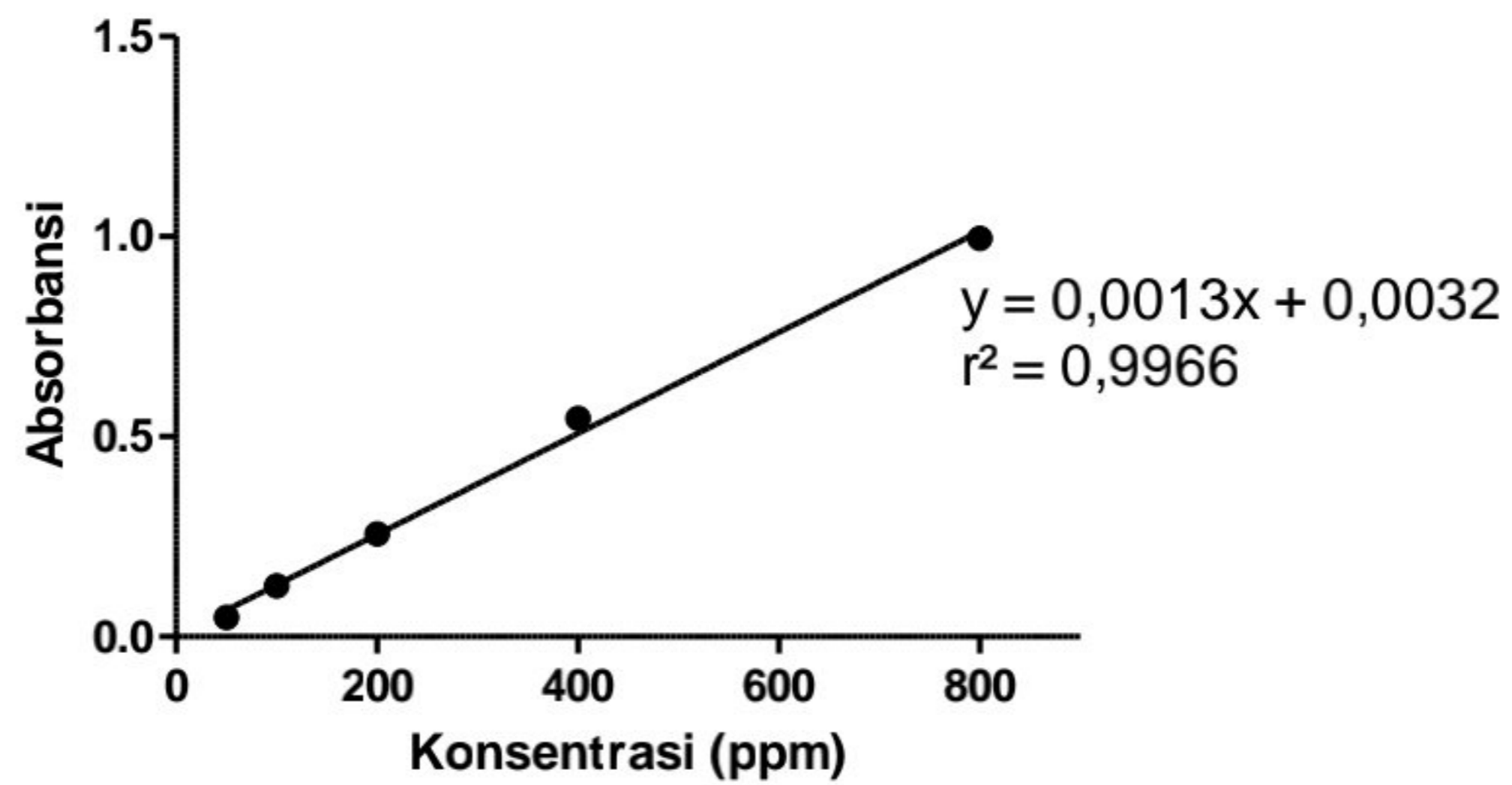
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LAMPIRAN

Lampiran 1. Skema Kerja Umum



Lampiran 2. Penetapan Kurva Baku dan Pengukuran kandungan GSNO dalam sediaan film *anti-acne*



Gambar 17. Kurva baku GSNO

Tabel 7. Pembuatan kurva baku

Konsentrasi ($\mu\text{g/mL}$)	Abs
800	0,996
400	0,545
200	0,257
100	0,127
50	0,048

Tabel 8. Hasil Uji Kandungan GSNO sebelum penyimpanan dalam sediaan film *anti-acne*

Formula	Abs	Konsentrasi ($\mu\text{g/mL}$)	Jumlah GSNO (mg/mg film)	Rata-rata \pm SD
F1	0,719	550,615	1,101	1,099 \pm 0,004
	0,719	550,615	1,101	
	0,715	547,538	1,095	
F2	1,112	852,923	1,706	1,571 \pm 0,117
	0,987	756,769	1,514	
	0,975	747,538	1,495	
F3	1,545	1186,000	2,372	2,376 \pm 0,004
	1,549	1189,077	2,378	
	1,549	1189,077	2,378	

Contoh perhitungan kandungan GSNO dalam sediaan film *anti-acne*

10 mg sediaan *Film* GSNO

↓ dilarutkan

10 mL metanol

↓ dicuplik

0,5 mL

dicukupkan dengan PBS

→ 1 mL (diukur absorbansinya)

Diketahui:

Abs F1 replikasi 1 = 0,719

Persamaan kurva baku $y = 0,0013x + 0,0032$

Faktor Pengenceran (FP) = 2

Maka,

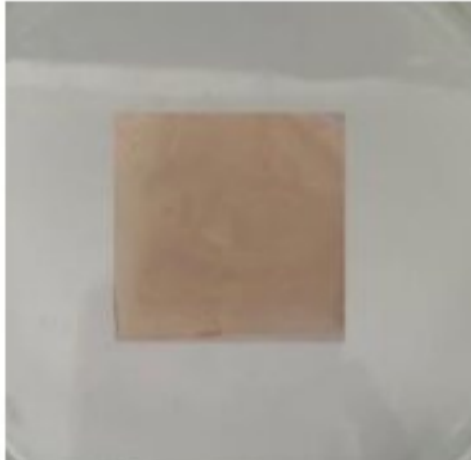
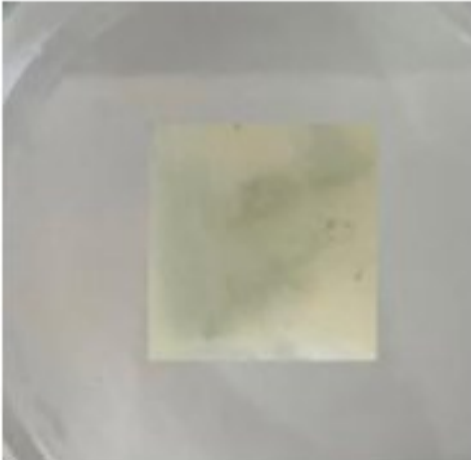













$$0,719 = 0,0013x + 0,0032$$

$$x = \frac{0,719 - 0,0032}{0,0013} = 550,615 \mu\text{g/mL}$$

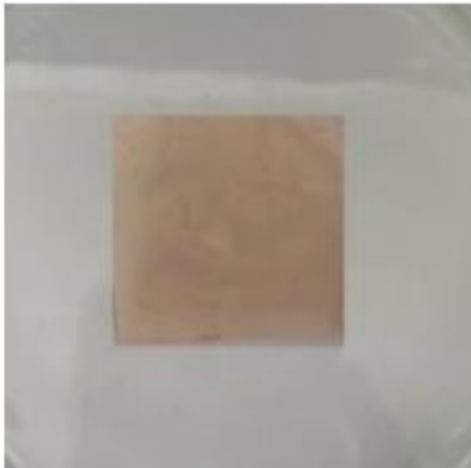
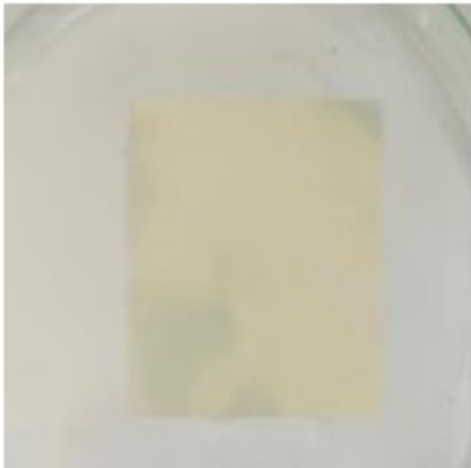
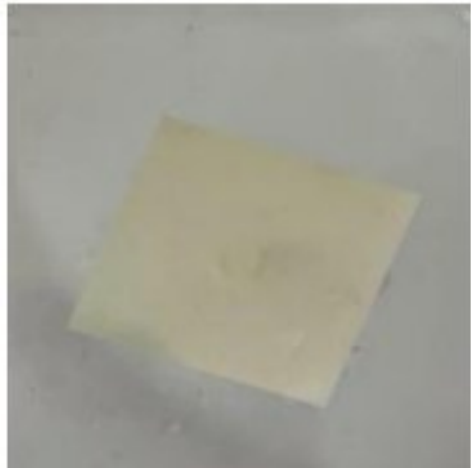
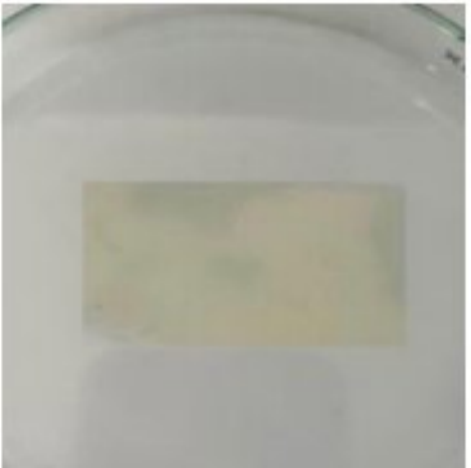
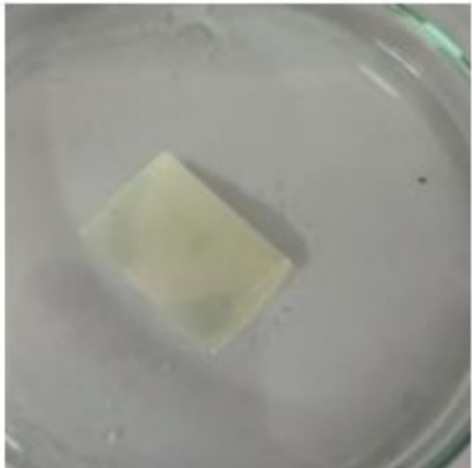










$$\text{Kandungan GSNO} = \frac{x \cdot fp \times 10 \text{ ml}}{\text{berat film yang ditimbang}}$$

$$\text{Kandungan GSNO} = \frac{550,615 \mu\text{g/mL} \times 2 \times 10 \text{ mL}}{10 \text{ mg film}} = 1,101 \text{ mg/mg film}$$


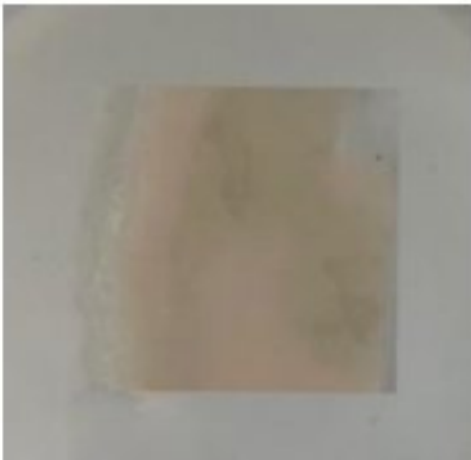

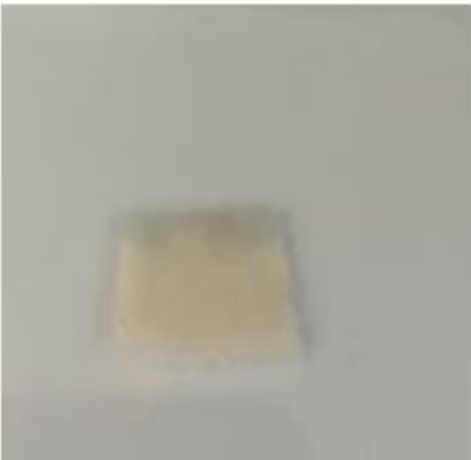











Lampiran 3. Hasil Uji Stabilitas Pengamatan Organoleptis**Tabel 9. Hasil uji organoleptis GSNO pada suhu 25 ± 3 °C**

Formula	Hari Ke-				
	0	3	6	9	12
F1					
F2					
F3					

Tabel 10. Hasil Uji Organoleptis GSNO pada Suhu 8 °C

Formula	Hari Ke-				
	0	3	6	9	12
F1					
F2					
F3					

Tabel 11. Hasil uji organoleptis GSNO pada suhu $-20\text{ }^{\circ}\text{C}$

Formula	Hari Ke-				
	0	3	6	9	12
F1					
F2					
F3					

Lampiran 4. Hasil Uji Stabilitas Pengukuran pH

Tabel 12. Hasil uji stabilitas pH pada suhu 25 ± 3 °C

Hari ke-	Kontrol		F1		F2		F3	
	pH	Rata-Rata \pm SD	pH	Rata-Rata \pm SD	pH	Rata-Rata \pm SD	pH	Rata-Rata \pm SD
0	7,45		6,12		6,95		6,88	
	7,59	7,55 \pm 0,09	6,09	6,10 \pm 0,02	6,88	6,89 \pm 0,05	6,75	6,78 \pm 0,09
	7,61		6,09		6,85		6,72	
3	7,30		5,96		6,87		6,64	
	7,37	7,35 \pm 0,04	5,94	5,94 \pm 0,02	6,72	6,75 \pm 0,11	6,72	6,71 \pm 0,07
	7,38		5,92		6,65		6,77	
6	6,73		5,98		6,41		6,62	
	6,84	6,82 \pm 0,09	5,92	5,92 \pm 0,06	6,46	6,45 \pm 0,04	6,62	6,61 \pm 0,02
	6,90		5,87		6,49		6,59	
9	6,71		5,88		6,17		6,58	
	6,71	6,72 \pm 0,01	5,83	5,78 \pm 0,13	6,25	6,24 \pm 0,07	6,52	6,53 \pm 0,04
	6,73		5,64		6,30		6,50	
12	6,65		5,95		6,05		6,21	
	6,68	6,68 \pm 0,04	5,67	5,75 \pm 0,17	6,10	6,10 \pm 0,05	6,41	6,40 \pm 0,18
	6,72		5,64		6,14		6,57	

Tabel 13. Hasil uji stabilitas pH pada suhu 8 °C

Hari ke-	Kontrol		F1		F2		F3	
	pH	Rata-Rata \pm SD	pH	Rata-Rata \pm SD	pH	Rata-Rata \pm SD	pH	Rata-Rata \pm SD
0	7,45		6,12		6,95		6,88	
	7,59	7,55 \pm 0,09	6,09	6,10 \pm 0,02	6,88	6,89 \pm 0,05	6,75	6,78 \pm 0,09
	7,61		6,09		6,85		6,72	
3	7,19		5,95		6,85		6,74	
	7,25	7,24 \pm 0,04	5,90	5,91 \pm 0,04	6,79	6,80 \pm 0,04	6,82	6,80 \pm 0,05
	7,27		5,88		6,77		6,84	
6	6,66		5,88		6,45		6,50	
	6,81	6,77 \pm 0,10	5,86	5,87 \pm 0,01	6,65	6,62 \pm 0,15	6,54	6,56 \pm 0,07
	6,84		5,86		6,75		6,63	
9	6,72		5,87		6,33		6,56	
	6,73	6,74 \pm 0,03	5,83	5,84 \pm 0,03	6,42	6,41 \pm 0,08	6,41	6,46 \pm 0,09
	6,77		5,82		6,48		6,40	
12	6,66		5,88		5,89		6,35	
	6,72	6,71 \pm 0,05	5,79	5,80 \pm 0,08	5,90	5,92 \pm 0,04	6,28	6,29 \pm 0,06
	6,76		5,72		5,96		6,23	

Tabel 14. Hasil uji stabilitas pH pada suhu $-20\text{ }^{\circ}\text{C}$

Hari ke-	Kontrol		F1		F2		F3	
	pH	Rata-Rata \pm SD	pH	Rata-Rata \pm SD	pH	Rata-Rata \pm SD	pH	Rata-Rata \pm SD
0	7,45		6,12		6,95		6,88	
	7,59	7,55 \pm 0,09	6,09	6,10 \pm 0,02	6,88	6,89 \pm 0,05	6,75	6,78 \pm 0,09
	7,61		6,09		6,85		6,72	
3	6,90		6,14		6,61		6,68	
	6,94	6,93 \pm 0,03	6,25	6,23 \pm 0,08	6,59	6,57 \pm 0,06	6,74	6,74 \pm 0,07
	6,95		6,30		6,50		6,81	
6	6,89		6,20		6,51		6,65	
	6,90	6,91 \pm 0,03	6,19	6,19 \pm 0,01	6,55	6,54 \pm 0,03	6,64	6,64 \pm 0,02
	6,94		6,19		6,57		6,62	
9	6,84		6,13		6,45		6,45	
	6,86	6,84 \pm 0,02	6,06	6,09 \pm 0,04	6,50	6,48 \pm 0,03	6,50	6,48 \pm 0,03
	6,82		6,08		6,50		6,50	
12	6,72		6,15		6,20		6,58	
	6,75	6,75 \pm 0,03	6,07	6,09 \pm 0,06	6,38	6,38 \pm 0,18	6,45	6,47 \pm 0,10
	6,77		6,04		6,56		6,38	

Lampiran 5. Hasil Uji Stabilitas Pengukuran Kandungan Obat

Tabel 15. Hasil uji kandungan obat F1 pada suhu $25\pm 3\text{ }^{\circ}\text{C}$

Hari ke-	Absorbansi	Jumlah Kandungan Obat (mg)	Rata-Rata \pm SD (mg)
0	0,719	1,101	
	0,719	1,101	1,099 \pm 0,004
	0,715	1,095	
3	0,705	1,080	
	0,718	1,100	1,095 \pm 0,013
	0,721	1,104	
6	0,444	0,678	
	0,442	0,675	0,676 \pm 0,002
	0,442	0,675	
9	0,366	0,558	
	0,342	0,521	0,531 \pm 0,023
	0,338	0,515	
12	0,243	0,369	
	0,239	0,363	0,365 \pm 0,004
	0,239	0,363	

Tabel 16. Hasil uji kandungan obat F2 pada suhu 25 ± 3 °C

Hari ke-	Absorbansi	Jumlah Kandungan Obat (mg/ mg film)	Rata-Rata± SD (mg/mg film)
0	1,112	1,706	1,571±0,117
	0,987	1,514	
	0,975	1,495	
3	0,9	1,380	1,410±0,032
	0,919	1,409	
	0,941	1,443	
6	0,682	1,044	1,050±0,005
	0,688	1,054	
	0,688	1,054	
9	0,594	0,909	0,917±0,010
	0,597	0,914	
	0,607	0,929	
12	0,458	0,700	0,688±0,013
	0,453	0,692	
	0,441	0,674	

Tabel 17. Hasil uji kandungan obat F3 pada suhu 25 ± 3 °C

Hari ke-	Absorbansi	Jumlah Kandungan Obat (mg/ mg film)	Rata-Rata± SD (mg/mg film)
0	1,545	2,372	2,376±0,004
	1,549	2,378	
	1,549	2,378	
3	1,523	2,338	2,336±0,018
	1,521	2,335	
	1,521	2,335	
6	1,351	2,074	2,096±0,036
	1,392	2,137	
	1,353	2,077	
9	0,853	1,307	1,293±0,012
	0,839	1,286	
	0,839	1,286	
12	0,585	0,895	0,901±0,005
	0,591	0,904	
	0,591	0,904	

Tabel 18. Hasil uji kandungan obat F1 pada suhu 8 °C

Hari ke-	Absorbansi	Jumlah Kandungan Obat (mg/ mg film)	Rata-Rata± SD (mg/mg film)
0	0,719	1,101	1,099±0,004
	0,719	1,101	
	0,715	1,095	
3	0,591	0,904	0,905±0,002
	0,591	0,904	
	0,593	0,907	
6	0,395	0,603	0,601±0,010
	0,4	0,610	
	0,387	0,590	
9	0,377	0,575	0,573±0,002
	0,375	0,572	
	0,375	0,572	
12	0,338	0,515	0,505±0,011
	0,333	0,507	
	0,324	0,494	

Tabel 19. Hasil uji kandungan obat F2 pada suhu 8 °C

Hari ke-	Absorbansi	Jumlah Kandungan Obat (mg/ mg film)	Rata-Rata± SD (mg/mg film)
0	1,112	1,706	1,571±0,117
	0,987	1,514	
	0,975	1,495	
3	0,878	1,346	1,343±0,003
	0,875	1,341	
	0,875	1,341	
6	0,71	1,087	1,094±0,005
	0,716	1,097	
	0,716	1,097	
9	0,725	1,110	1,067±0,041
	0,693	1,061	
	0,672	1,029	
12	0,418	0,638	0,680±0,069
	0,497	0,760	
	0,42	0,641	

Tabel 20. Hasil uji kandungan obat F3 pada suhu 8 °C

Hari ke-	Absorbansi	Jumlah Kandungan Obat (mg/ mg film)	Rata-Rata± SD (mg/mg film)
0	1,545	2,372	2,372±0,004
	1,549	2,378	
	1,549	2,378	
3	1,418	2,177	2,218±0,069
	1,497	2,298	
	1,42	2,180	
6	0,967	1,483	1,481±0,002
	0,965	1,480	
	0,965	1,480	
9	0,798	1,223	1,313±0,092
	0,853	1,307	
	0,918	1,407	
12	0,355	0,541	0,546±0,004
	0,36	0,549	
	0,36	0,549	

Tabel 21. Hasil uji kandungan obat F1 pada suhu -20 °C

Hari ke-	Absorbansi	Jumlah Kandungan Obat (mg/ mg film)	Rata-Rata± SD (mg/mg film)
0	0,719	1,101	1,099±0,004
	0,719	1,101	
	0,715	1,095	
3	0,595	0,910	0,908±0,006
	0,589	0,901	
	0,596	0,912	
6	0,593	0,907	0,903±0,004
	0,589	0,901	
	0,588	0,900	
9	0,585	0,895	0,890±0,017
	0,569	0,870	
	0,591	0,904	
12	0,564	0,863	0,875±0,012
	0,572	0,875	
	0,579	0,886	

Tabel 22. Hasil uji kandungan obat F2 pada suhu $-20\text{ }^{\circ}\text{C}$

Hari ke-	Absorbansi	Jumlah Kandungan Obat (mg/ mg film)	Rata-Rata \pm SD (mg/mg film)
0	1,112	1,706	1,571 \pm 0,117
	0,987	1,514	
	0,975	1,495	
3	0,785	1,203	1,205 \pm 0,007
	0,792	1,214	
	0,783	1,200	
6	0,76	1,164	1,162 \pm 0,002
	0,758	1,161	
	0,758	1,161	
9	0,749	1,147	1,148 \pm 0,004
	0,747	1,144	
	0,752	1,152	
12	0,756	1,158	1,146 \pm 0,010
	0,743	1,138	
	0,746	1,143	

Tabel 23. Hasil uji kandungan obat F3 pada suhu $-20\text{ }^{\circ}\text{C}$

Hari ke-	Absorbansi	Jumlah Kandungan Obat (mg/ mg film)	Rata-Rata \pm SD (mg/mg film)
0	1,545	2,372	2,376 \pm 0,004
	1,549	2,378	
	1,549	2,378	
3	0,815	1,249	1,251 \pm 0,004
	0,815	1,249	
	0,82	1,257	
6	0,785	1,203	1,164 \pm 0,038
	0,759	1,163	
	0,736	1,127	
9	0,769	1,178	1,158 \pm 0,023
	0,758	1,161	
	0,74	1,134	
12	0,741	1,135	1,149 \pm 0,015
	0,76	1,164	
	0,749	1,147	

Lampiran 6. Hasil Uji Pelepasan GSNO terhadap Sediaan Film Anti-Acne

Tabel 24. Hasil Uji Pelepasan GSNO pada F1

Waktu (jam)	Absorbansi	Konsentrasi ($\mu\text{g/mL}$)	Faktor pengenceran	Jumlah yang terukur (mg) dalam 100 mL	Faktor koreksi	Total GSNO yang terlepas (mg) per interval	Rata-rata \pm SD (mg)
0,25	0,002	2,154	1	0,215	0	0,215	0,113 \pm 0,089
	0,004	0,615	1	0,062	0	0,062	
	0,004	0,615	1	0,062	0	0,062	
0,5	0,012	6,769	1	0,677	0,002	0,679	0,934 \pm 0,234
	0,018	11,385	1	1,138	0,001	1,139	
	0,016	9,846	1	0,985	0,001	0,985	
1	0,048	34,462	1	3,446	0,011	3,457	3,714 \pm 0,235
	0,052	37,538	1	3,754	0,013	3,766	
	0,054	39,077	1	3,908	0,011	3,919	
2	0,056	40,615	1	4,062	0,054	4,116	4,069 \pm 0,086
	0,054	39,077	1	3,908	0,062	3,970	
	0,056	40,615	1	4,062	0,061	4,122	
3	0,068	49,846	1	4,985	0,138	5,123	5,234 \pm 0,181
	0,068	49,846	1	4,985	0,151	5,135	
	0,072	52,923	1	5,292	0,151	5,443	
4	0,079	58,308	1	5,831	0,272	6,103	6,244 \pm 0,230
	0,079	58,308	1	5,831	0,289	6,120	
	0,084	62,154	1	6,215	0,294	6,509	

Lanjutan Tabel 24

Waktu (jam)	Absorbansi	Konsentrasi ($\mu\text{g/mL}$)	Faktor pengenceran	Jumlah yang terukur (mg) dalam 100 mL	Faktor koreksi	Total GSNO yang terlepas (mg) per interval	Rata-rata \pm SD (mg)
5	0,082	60,615	1	6,062	0,464	6,526	6,647 \pm 0,192
	0,082	60,615	1	6,062	0,486	6,548	
	0,086	63,692	1	6,369	0,499	6,868	
6	0,123	92,154	1	9,215	0,717	9,933	10,266 \pm 0,322
	0,131	98,308	1	9,831	0,743	10,574	
	0,127	95,231	1	9,523	0,768	10,291	
7	0,156	117,538	1	11,754	1,062	12,816	13,057 \pm 0,250
	0,162	122,154	1	12,215	1,099	13,314	
	0,158	119,077	1	11,908	1,132	13,040	
8	0,185	139,846	1	13,985	1,525	15,509	15,659 \pm 0,217
	0,185	139,846	1	13,985	1,577	15,562	
	0,189	142,923	1	14,292	1,615	15,908	
24	0,239	181,385	1	18,138	2,127	20,265	20,326 \pm 0,185
	0,237	179,846	1	17,985	2,195	20,179	
	0,241	182,923	1	18,292	2,242	20,534	

Tabel 25. Hasil Uji Pelepasan GSNO pada F2

Waktu (jam)	Absorbansi	Konsentrasi ($\mu\text{g/mL}$)	Faktor pengenceran	Jumlah yang terukur (mg) dalam 100 mL	Faktor koreksi	Total GSNO yang terlepas (mg) per interval	Rata-rata \pm SD (mg)
0,25	0,004	0,615	1	0,062	0	0,062	0,113 \pm 0,044
	0,005	1,385	1	0,138	0	0,138	
	0,005	1,385	1	0,138	0	0,138	
0,5	0,012	6,769	1	0,677	0,001	0,678	0,575 \pm 0,177
	0,008	3,692	1	0,369	0,001	0,371	
	0,012	6,769	1	0,677	0,001	0,678	
1	0,032	22,154	1	2,215	0,008	2,223	2,377 \pm 0,265
	0,038	26,769	1	2,677	0,006	2,683	
	0,032	22,154	1	2,215	0,010	2,225	
2	0,042	29,846	1	2,985	0,038	3,022	3,151 \pm 0,223
	0,042	29,846	1	2,985	0,038	3,023	
	0,047	33,692	1	3,369	0,040	3,409	
3	0,058	42,154	1	4,215	0,097	4,312	4,264 \pm 0,086
	0,058	42,154	1	4,215	0,100	4,315	
	0,056	40,615	1	4,062	0,104	4,165	
4	0,067	49,077	1	4,908	0,198	5,106	5,060 \pm 0,232
	0,069	50,615	1	5,062	0,204	5,265	
	0,063	46,000	1	4,600	0,208	4,808	

Lanjutan Tabel 25

Waktu (jam)	Absorbansi	Konsentrasi ($\mu\text{g/mL}$)	Faktor pengenceran	Jumlah yang terukur (mg) dalam 100 mL	Faktor koreksi	Total GSNO yang terlepas (mg) per interval	Rata-rata \pm SD (mg)
5	0,075	55,231	1	5,523	0,349	5,872	5,725 \pm 0,128
	0,072	52,923	1	5,292	0,358	5,651	
	0,072	52,923	1	5,292	0,359	5,651	
6	0,084	62,154	1	6,215	0,555	6,770	6,751 \pm 0,195
	0,086	63,692	1	6,369	0,566	6,935	
	0,081	59,846	1	5,985	0,563	6,547	
7	0,094	69,846	1	6,985	0,823	7,808	7,916 \pm 0,176
	0,094	69,846	1	6,985	0,837	7,821	
	0,098	72,923	1	7,292	0,826	8,118	
8	0,111	82,923	1	8,292	1,161	9,453	9,485 \pm 0,187
	0,109	81,385	1	8,138	1,178	9,316	
	0,114	85,231	1	8,523	1,162	9,685	
24	0,129	96,769	1	9,677	1,582	11,258	11,573 \pm 0,317
	0,137	102,923	1	10,292	1,600	11,892	
	0,133	99,846	1	9,985	1,584	11,568	

Tabel 26. Hasil Uji Pelepasan GSNO pada F3

Waktu (jam)	Absorbansi	Konsentrasi ($\mu\text{g/mL}$)	Faktor pengenceran	Jumlah yang terukur (mg) dalam 100 mL	Faktor koreksi	Total GSNO yang terlepas (mg) per interval	Rata-rata \pm SD (mg)
0,25	0,004	0,615	1	0,062	0	0,062	0,087 \pm 0,044
	0,004	0,615	1	0,062	0	0,062	
	0,005	1,385	1	0,138	0	0,138	
0,5	0,018	11,385	1	1,138	0,001	1,139	1,088 \pm 0,089
	0,016	9,846	1	0,985	0,001	0,985	
	0,018	11,385	1	1,138	0,001	1,140	
1	0,021	13,692	1	1,369	0,013	1,382	1,510 \pm 0,223
	0,021	13,692	1	1,369	0,011	1,380	
	0,026	17,538	1	1,754	0,014	1,768	
2	0,036	25,231	1	2,523	0,038	2,561	2,306 \pm 0,233
	0,032	22,154	1	2,215	0,035	2,251	
	0,03	20,615	1	2,062	0,044	2,106	
3	0,042	29,846	1	2,985	0,089	3,074	3,330 \pm 0,232
	0,048	34,462	1	3,446	0,082	3,528	
	0,046	32,923	1	3,292	0,095	3,388	
4	0,057	41,385	1	4,138	0,170	4,308	4,078 \pm 0,205
	0,052	37,538	1	3,754	0,162	3,916	
	0,053	38,308	1	3,831	0,179	4,010	

Lanjutan Tabel 26

Waktu (jam)	Absorbansi	Konsentrasi ($\mu\text{g/mL}$)	Faktor pengenceran	Jumlah yang terukur (mg) dalam 100 mL	Faktor koreksi	Total GSNO yang terlepas (mg) per interval	Rata-rata \pm SD (mg)
5	0,06	43,692	1	4,369	0,292	4,661	4,814 \pm 0,148
	0,064	46,769	1	4,677	0,281	4,958	
	0,062	45,231	1	4,523	0,301	4,824	
6	0,076	56,000	1	5,600	0,458	6,058	6,211 \pm 0,133
	0,079	58,308	1	5,831	0,446	6,276	
	0,079	58,308	1	5,831	0,469	6,300	
7	0,086	63,692	1	6,369	0,680	7,049	7,050 \pm 0,167
	0,084	62,154	1	6,215	0,669	6,884	
	0,088	65,231	1	6,523	0,694	7,218	
8	0,094	69,846	1	6,985	0,965	7,950	8,209 \pm 0,333
	0,096	71,385	1	7,138	0,955	8,093	
	0,102	76,000	1	7,600	0,985	8,585	
24	0,112	83,692	1	8,369	1,321	9,690	9,851 \pm 0,141
	0,115	86,000	1	8,600	1,312	9,912	
	0,115	86,000	1	8,600	1,352	9,952	

Lampiran 7. Contoh perhitungan pelepasan dan kinetika pelepasan obat
Lampiran 7.1 Contoh perhitungan pelepasan obat

Persamaan: $y = 0,0013x + 0,0032$

Keterangan:

$y =$ serapan $a = 0,0032$

$x =$ konsentrasi $b = 0,0013$

F1 Replikasi ke-1, jam ke-1 diperoleh serapan = 0,048. Sehingga, untuk mendapatkan konsentrasi:

$$x = \frac{y - a}{b}$$

$$x = \frac{0,048 - 0,0032}{0,0013}$$

$x = 34,462 \mu\text{g} / \text{mL}$

Konsentrasi obat jam ke-1 dalam media pelepasan

= kadar terukur x media pelepasan x faktor pengenceran

= $34,462 \mu\text{g}/\text{ml} \times 100 \text{ mL} \times 1$

= 3,446 mg

Faktor koreksi = $\frac{\text{Konsentrasi Obat sebelumnya}}{1000} +$ faktor koreksi jam sebelumnya

Faktor koreksi = $\frac{\text{Konsentrasi Obat sebelumnya}}{1000} +$ faktor koreksi jam ke-0,5

Faktor koreksi = $\frac{6,769 + 2,154}{1000} + 0,002 = 0,011 \text{ mg}$

Jumlah obat yang terlepas = konsentrasi dalam media pelepasan + Faktor koreksi

Jumlah GSNO yang terlepas = 3,446 mg + 0,011 mg = 3,457 mg

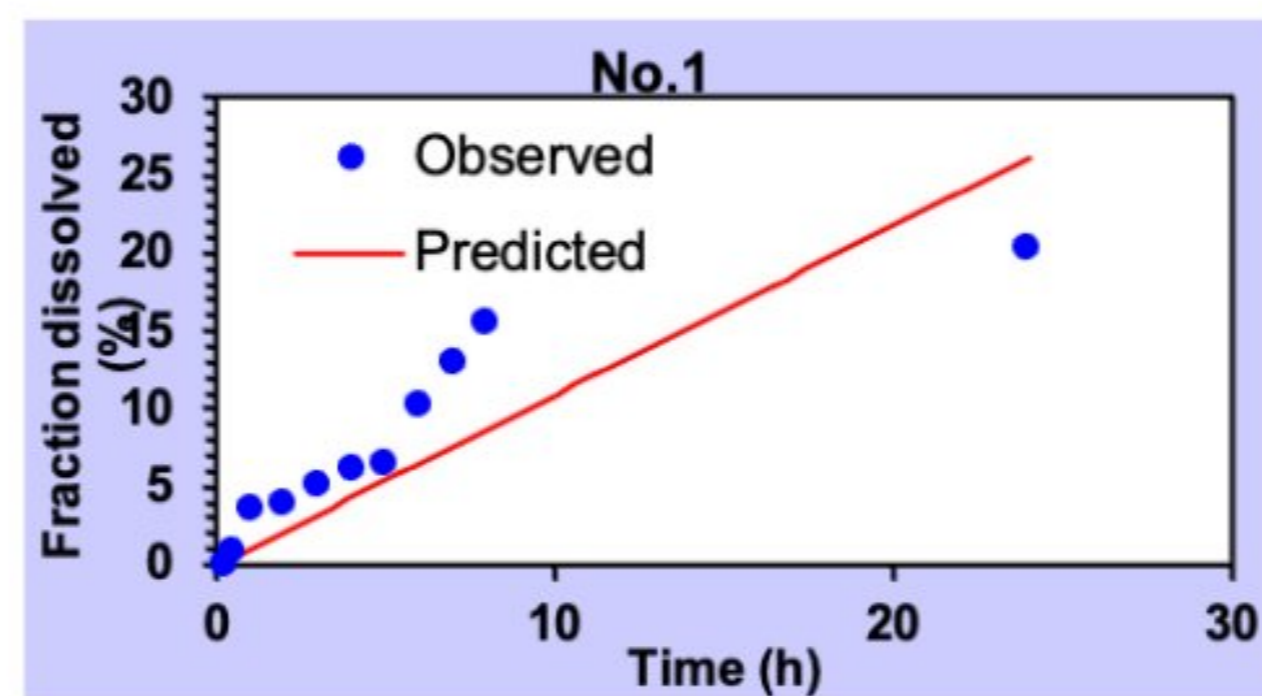
Lampiran 7.2 Perhitungan model kinetika pelepasan obat menggunakan
Software *DDsolver* untuk Pelepasan F1

DDSolver 1.0		Dissolution Data Modeling of Zero-order Model	
Time Unit	h	Analyst	Shabrina V
Model	Zero-order	Date	2023-9-10
Equation	$F=k_0*t$	Time	13.34.36

Time (h)	No.1 F(%)	Mean	SD	RSD(%)
0,25	0,11	0,11		
0,5	0,93	0,93		
1	3,71	3,71		
2	4,07	4,07		
3	5,23	5,23		
4	6,24	6,24		
5	6,65	6,65		
6	10,27	10,27		
7	13,06	13,06		
8	15,66	15,66		
24	20,33	20,33		

Best-fit Values				
Parameter	No.1	Mean	SD	RSD(%)
k0	1,092	1,092		

Goodness of Fit	
Parameter	No.1
N_observed	11
DF	10
R_obs-pre	0,8918
Rsqr	0,6371
Rsqr_adj	0,6371
MSE	14,4991
MSE_root	3,8078
Weighting	1
SS	144,9915
WSS	144,9915
AIC	56,7434
MSC	0,8318



DDSolver 1.0 *Dissolution Data Modeling of First-order Model*

Time Unit	h	Analyst	Shabrina V
Model	First-order	Date	2023-9-10
Equation	$F=100*[1-Exp(-k1*t)]$	Time	13.35.14

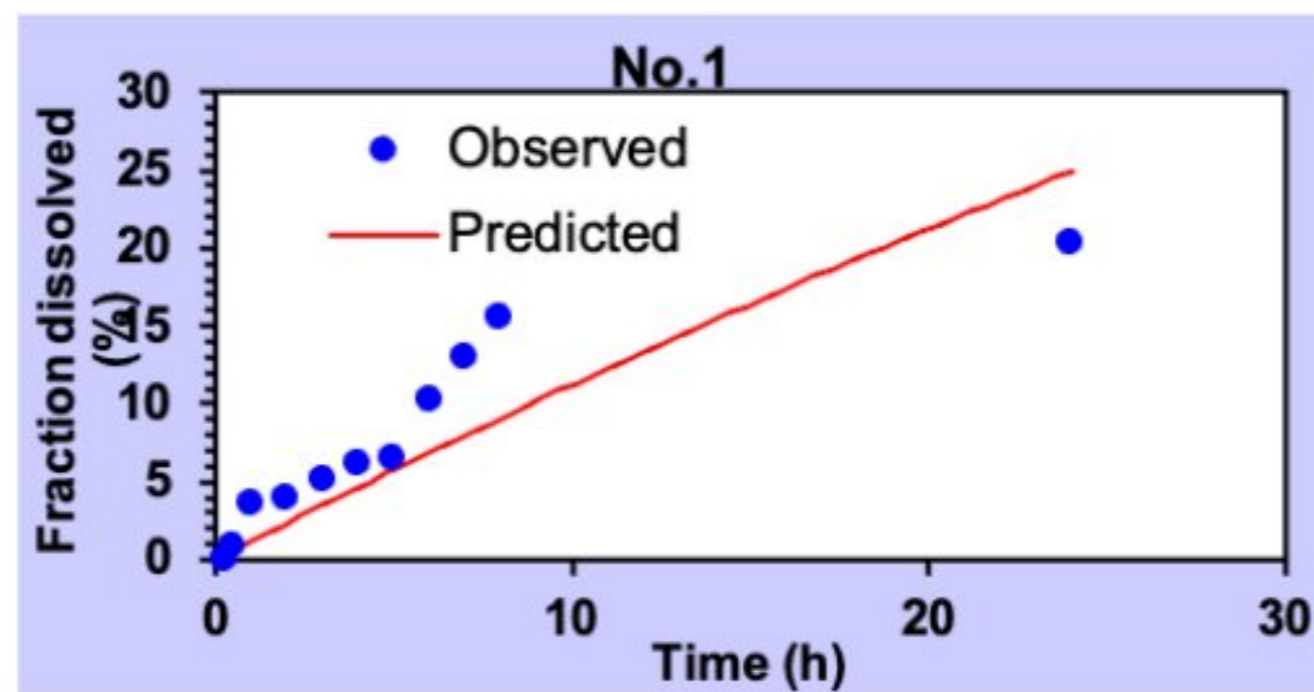
Time (h)	No.1 F(%)	Mean	SD	RSD(%)
0,25	0,11	0,11		
0,5	0,93	0,93		
1	3,71	3,71		
2	4,07	4,07		
3	5,23	5,23		
4	6,24	6,24		
5	6,65	6,65		
6	10,27	10,27		
7	13,06	13,06		
8	15,66	15,66		
24	20,33	20,33		

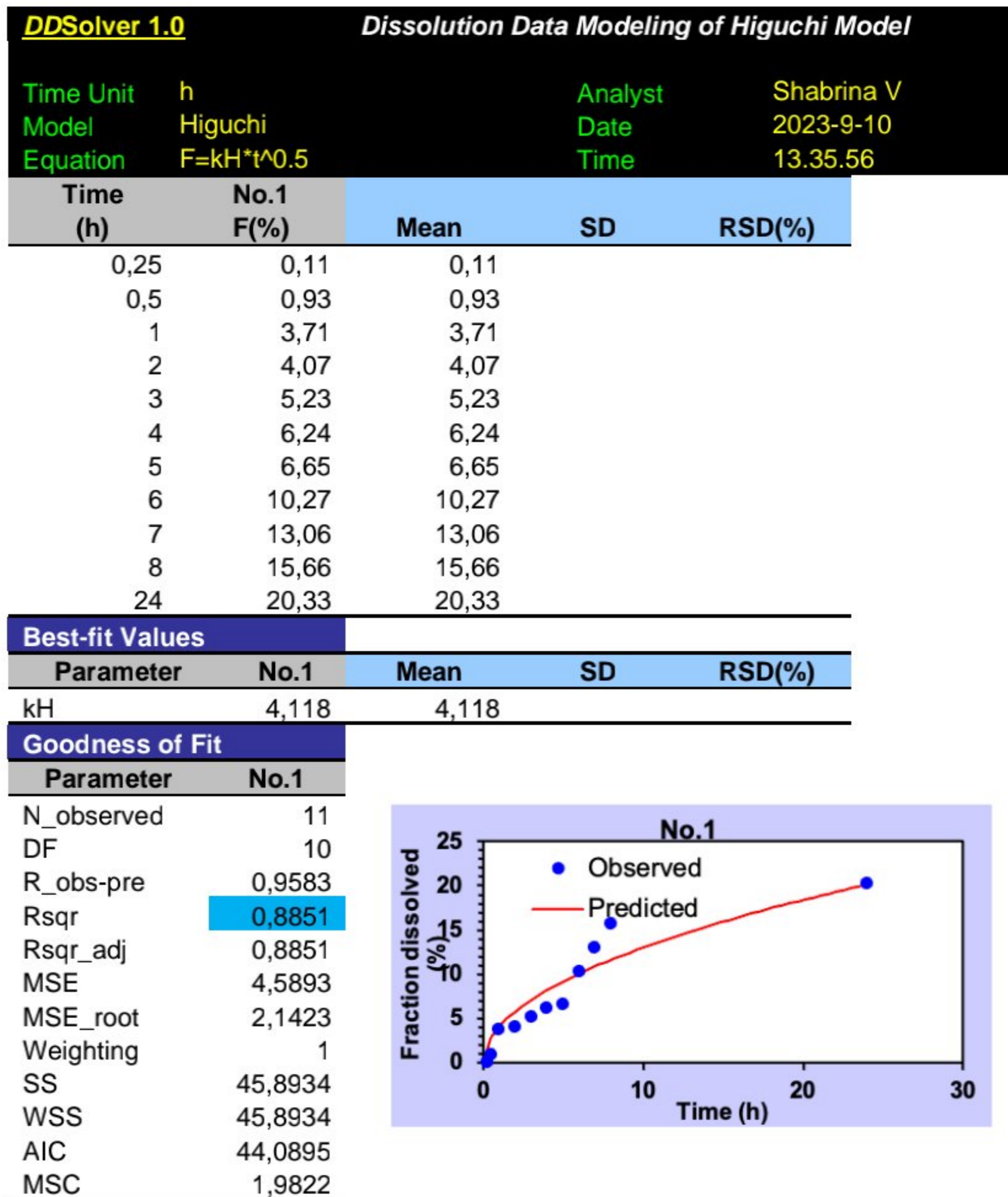
Best-fit Values

Parameter	No.1	Mean	SD	RSD(%)
k1	0,012	0,012		

Goodness of Fit

Parameter	No.1
N_observed	11
DF	10
R_obs-pre	0,9083
Rsqr	0,7095
Rsqr_adj	0,7095
MSE	11,6049
MSE_root	3,4066
Weighting	1
SS	116,0493
WSS	116,0493
AIC	54,2942
MSC	1,0545





DDSolver 1.0**Dissolution Data Modeling of Korsmeyer-Peppas Model**

Time Unit	h	Analyst	Shabrina V
Model	Korsmeyer-Peppas	Date	2023-9-10
Equation	$F=kKP*t^n$	Time	13.36.40

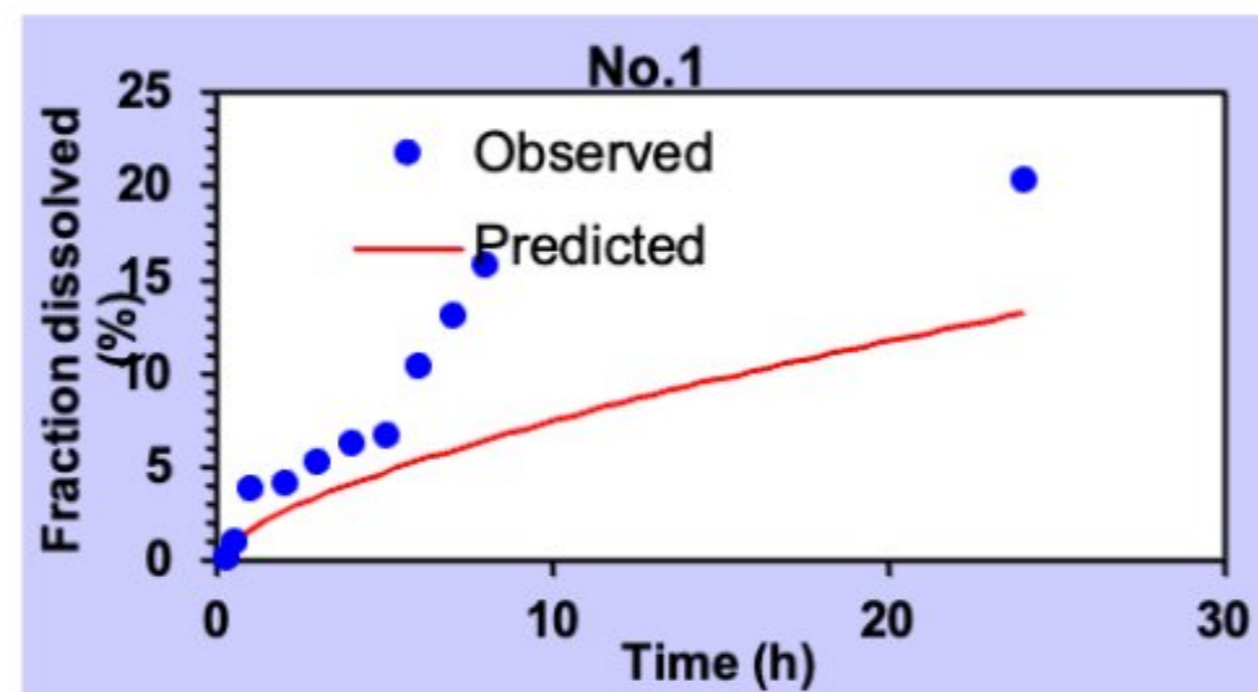
Time (h)	No.1 F(%)	Mean	SD	RSD(%)
0,25	0,11	0,11		
0,5	0,93	0,93		
1	3,71	3,71		
2	4,07	4,07		
3	5,23	5,23		
4	6,24	6,24		
5	6,65	6,65		
6	10,27	10,27		
7	13,06	13,06		
8	15,66	15,66		
24	20,33	20,33		

Best-fit Values

Parameter	No.1	Mean	SD	RSD(%)
kKP	1,661	1,661		
n	0,653	0,653		

Goodness of Fit

Parameter	No.1
N_observed	11
DF	9
R_obs-pre	0,9461
Rsqr	0,4279
Rsqr_adj	0,3643
MSE	25,3992
MSE_root	5,0398
Weighting	1
SS	228,5925
WSS	228,5925
AIC	63,7513
MSC	0,1948



DDSolver 1.0		Dissolution Data Modeling of Hixson-Crowell Model	
Time Unit	h	Analyst	Shabrina V
Model	Hixson-Crowell	Date	2023-9-10
Equation	$F=100*[1-(1-kHC*t)^3]$	Time	13.37.14

Time (h)	No.1 F(%)	Mean	SD	RSD(%)
0,25	0,11	0,11		
0,5	0,93	0,93		
1	3,71	3,71		
2	4,07	4,07		
3	5,23	5,23		
4	6,24	6,24		
5	6,65	6,65		
6	10,27	10,27		
7	13,06	13,06		
8	15,66	15,66		
24	20,33	20,33		

Best-fit Values				
Parameter	No.1	Mean	SD	RSD(%)
kHC	0,004	0,004		

Goodness of Fit	
Parameter	No.1
N_observed	11
DF	10
R_obs-pre	0,9030
Rsqr	0,6875
Rsqr_adj	0,6875
MSE	12,4860
MSE_root	3,5336
Weighting	1
SS	124,8599
WSS	124,8599
AIC	55,0991
MSC	0,9813

Lampiran 8. Data Hasil Analisis Statistik

Lampiran 8.1. Analisis Statistik terhadap Uji Kandungan Obat

	Tests of Normality						
	Formula	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Kandungan	F1	.385	3	.	.750	3	.000
Obat Sebelum	F2	.370	3	.	.786	3	.081
Penyimpanan	F3	.385	3	.	.750	3	.000

a. Lilliefors Significance Correction

Independent-Samples Kruskal-Wallis Test Summary

Total N	9
Test Statistic	7.322 ^a
Degree Of Freedom	2
Asymptotic Sig.(2-sided test)	.026

a. The test statistic is adjusted for ties.

Pairwise Comparisons of Formula

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Test Sig.	Adj. Sig. ^a
F1-F2	-3.000	2.217	-1.353	.176	.528
F1-F3	-6.000	2.217	-2.706	.007	.020
F2-F3	-3.000	2.217	-1.353	.176	.528

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Lampiran 8.2. Analisis Statistik terhadap Uji Stabilitas pH

Suhu 25±3°C

		Tests of Normality					
		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Formula	Statistic	df	Sig.	Statistic	df	Sig.
Hari_0	F1	.385	3	.	.750	3	.000
	F2	.269	3	.	.949	3	.567
	F3	.319	3	.	.885	3	.339
	Kontrol	.343	3	.	.842	3	.220
Hari_3	F1	.175	3	.	1.000	3	1.000
	F2	.260	3	.	.958	3	.605
	F3	.227	3	.	.983	3	.747
	Kontrol	.343	3	.	.842	3	.220
Hari_6	F1	.191	3	.	.997	3	.900
	F2	.232	3	.	.980	3	.726
	F3	.385	3	.	.750	3	.000
	Kontrol	.243	3	.	.972	3	.679
Hari_9	F1	.310	3	.	.898	3	.380
	F2	.227	3	.	.983	3	.747
	F3	.292	3	.	.923	3	.463
	Kontrol	.385	3	.	.750	3	.000
Hari_12	F1	.354	3	.	.822	3	.168
	F2	.196	3	.	.996	3	.878
	F3	.196	3	.	.996	3	.878
	Kontrol	.204	3	.	.993	3	.843

a. Lilliefors Significance Correction

Friedman Test

Test Statistics ^a	
N	12
Chi-Square	45.071
df	4
Asymp. Sig.	.000

a. Friedman Test

		Test Statistics ^a									
		Hari_3 - Hari_0	Hari_6 - Hari_0	Hari_9 - Hari_0	Hari_12 - Hari_0	Hari_6 - Hari_3	Hari_9 - Hari_3	Hari_12 - Hari_3	Hari_9 - Hari_6	Hari_12 - Hari_6	Hari_12 - Hari_9
Z		-2.905 ^b	-3.061 ^b	-3.061 ^b	-3.059 ^b	-2.907 ^b	-3.059 ^b	-3.059 ^b	-3.062 ^b	-3.061 ^b	-2.136 ^b
Asymp. Sig. (2- tailed)		.004	.002	.002	.002	.004	.002	.002	.002	.002	.033

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Suhu 8°C

Tests of Normality

	Formula	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Hari_0	F1	.385	3	.	.750	3	.000
	F2	.269	3	.	.949	3	.567
	F3	.319	3	.	.885	3	.339
	Kontrol	.343	3	.	.842	3	.220
Hari_3	F1	.276	3	.	.942	3	.537
	F2	.292	3	.	.923	3	.463
	F3	.314	3	.	.893	3	.363
	Kontrol	.292	3	.	.923	3	.463
Hari_6	F1	.385	3	.	.750	3	.000
	F2	.253	3	.	.964	3	.637
	F3	.265	3	.	.953	3	.583
	Kontrol	.328	3	.	.871	3	.298
Hari_9	F1	.314	3	.	.893	3	.363
	F2	.219	3	.	.987	3	.780
	F3	.365	3	.	.797	3	.107
	Kontrol	.314	3	.	.893	3	.363
Hari_12	F1	.200	3	.	.995	3	.862
	F2	.337	3	.	.855	3	.253
	F3	.211	3	.	.991	3	.817
	Kontrol	.219	3	.	.987	3	.780

a. Lilliefors Significance Correction

Friedman Test
Test Statistics^a

N	12
Chi-Square	43.496
df	4
Asymp. Sig.	.000

a. Friedman Test

Test Statistics^a

	Hari_3 - Hari_0	Hari_6 - Hari_0	Hari_9 - Hari_0	Hari_12 - Hari_0	Hari_6 - Hari_3	Hari_9 - Hari_3	Hari_12 - Hari_3	Hari_9 - Hari_6	Hari_12 - Hari_6	Hari_12 - Hari_9
Z	-2.590 ^b	-3.064 ^b	-3.061 ^b	-3.059 ^b	-3.061 ^b	-3.061 ^b	-3.061 ^b	-2.355 ^b	-2.803 ^b	-2.908 ^b
Asymp. Sig. (2- tailed)	.010	.002	.002	.002	.002	.002	.002	.019	.005	.004

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Suhu -20 °C

Tests of Normality

Formula	Kolmogorov-Smirnov ^a			Shapiro-Wilk			
	Statistic	df	Sig.	Statistic	df	Sig.	
Hari_0	F1	.385	3	.	.750	3	.000
	F2	.269	3	.	.949	3	.567
	F3	.319	3	.	.885	3	.339
	Kontrol	.343	3	.	.842	3	.220
Hari_3	F1	.263	3	.	.955	3	.593
	F2	.321	3	.	.881	3	.328
	F3	.187	3	.	.998	3	.915
	Kontrol	.314	3	.	.893	3	.363
Hari_6	F1	.385	3	.	.750	3	.000
	F2	.253	3	.	.964	3	.637
	F3	.253	3	.	.964	3	.637
	Kontrol	.314	3	.	.893	3	.363
Hari_9	F1	.276	3	.	.942	3	.537
	F2	.385	3	.	.750	3	.000
	F3	.385	3	.	.750	3	.000
	Kontrol	.175	3	.	1.000	3	1.000
Hari_12	F1	.282	3	.	.936	3	.510
	F2	.175	3	.	1.000	3	1.000
	F3	.245	3	.	.971	3	.672
	Kontrol	.219	3	.	.987	3	.780

a. Lilliefors Significance Correction

**Friedman Test
Test Statistics^a**

N	12
Chi-Square	29.506
df	4
Asymp. Sig.	.000

a. Friedman Test

Test Statistics^a

	Hari_3 - Hari_0	Hari_6 - Hari_0	Hari_9 - Hari_0	Hari_12 - Hari_0	Hari_6 - Hari_3	Hari_9 - Hari_3	Hari_12 - Hari_3	Hari_9 - Hari_6	Hari_12 - Hari_6	Hari_12 - Hari_9
Z	-1.883 ^b	-2.514 ^b	-2.943 ^b	-2.905 ^b	-1.925 ^b	-2.934 ^b	-2.828 ^b	-3.063 ^b	-3.065 ^b	-1.493 ^b
Asymp. Sig. (2- tailed)	.060	.012	.003	.004	.054	.003	.005	.002	.002	.135

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Lampiran 8.3. Analisis Statistik terhadap Uji Stabilitas Kandungan Obat

Suhu 25±3°C

	Tests of Normality						
	Formula	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Hari_0	F1	.385	3	.	.750	3	.000
	F2	.357	3	.	.815	3	.151
	F3	.385	3	.	.750	3	.000
Hari_3	F1	.319	3	.	.884	3	.338
	F2	.186	3	.	.998	3	.918
	F3	.385	3	.	.750	3	.000
Hari_6	F1	.385	3	.	.750	3	.000
	F2	.385	3	.	.750	3	.000
	F3	.370	3	.	.787	3	.083
Hari_9	F1	.337	3	.	.854	3	.250
	F2	.301	3	.	.911	3	.423
	F3	.385	3	.	.750	3	.000
Hari_12	F1	.385	3	.	.750	3	.000
	F2	.272	3	.	.946	3	.554
	F3	.385	3	.	.750	3	.000

a. Lilliefors Significance Correction

Friedman Test	
Test Statistics ^a	
N	9
Chi-Square	35.289
df	4
Asym. Sig.	.000

a. Friedman Test

		Test Statistics ^a									
		Hari_3 - Hari_0	Hari_6 - Hari_0	Hari_9 - Hari_0	Hari_12 - Hari_0	Hari_6 - Hari_3	Hari_9 - Hari_3	Hari_12 - Hari_3	Hari_9 - Hari_6	Hari_12 - Hari_6	Hari_12 - Hari_9
Z		-2.431 ^b	-2.666 ^b	-2.670 ^b	-2.670 ^b	-2.666 ^b	-2.668 ^b	-2.668 ^b	-2.666 ^b	-2.668 ^b	-2.668 ^b
Asymp. Sig. (2- tailed)		.015	.008	.008	.008	.008	.008	.008	.008	.008	.008

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Suhu 8°C

	Formula	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Hari_0	F1	.385	3	.	.750	3	.000
	F2	.370	3	.	.786	3	.081
	F3	.385	3	.	.750	3	.000
Hari_3	F1	.385	3	.	.750	3	.000
	F2	.385	3	.	.750	3	.000
	F3	.385	3	.	.750	3	.000
Hari_6	F1	.175	3	.	1.000	3	1.000
	F2	.385	3	.	.750	3	.000
	F3	.385	3	.	.750	3	.000
Hari_9	F1	.385	3	.	.750	3	.000
	F2	.232	3	.	.980	3	.726
	F3	.181	3	.	.999	3	.942
Hari_12	F1	.253	3	.	.964	3	.637
	F2	.385	3	.	.750	3	.000
	F3	.385	3	.	.750	3	.000

a. Lilliefors Significance Correction

Friedman Test

	Test Statistics ^a
N	9
Chi-Square	35.289
df	4
Asymp. Sig.	.000

a. Friedman Test

Test Statistics^a

	Hari_3 - Hari_0	Hari_6 - Hari_0	Hari_9 - Hari_0	Hari_12 - Hari_0	Hari_6 - Hari_3	Hari_9 - Hari_3	Hari_12 - Hari_3	Hari_9 - Hari_6	Hari_12 - Hari_6	Hari_12 - Hari_9
Z	-2.668 ^b	-2.668 ^b	-2.666 ^b	-2.675 ^b	-2.668 ^b	-2.666 ^b	-2.666 ^b	-2.439 ^b	-2.670 ^b	-2.668 ^b
Asymp. Sig. (2-tailed)	.008	.008	.008	.007	.008	.008	.008	.015	.008	.008

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Suhu -20 °C

Tests of Normality

	Formula	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Hari_0	F1	.385	3	.	.750	3	.000
	F2	.357	3	.	.815	3	.151
	F3	.385	3	.	.750	3	.000
Hari_3	F1	.338	3	.	.852	3	.246
	F2	.303	3	.	.908	3	.412
	F3	.385	3	.	.750	3	.000
Hari_6	F1	.316	3	.	.890	3	.353
	F2	.385	3	.	.750	3	.000
	F3	.183	3	.	.999	3	.933
Hari_9	F1	.282	3	.	.935	3	.509
	F2	.218	3	.	.988	3	.786
	F3	.229	3	.	.981	3	.738
Hari_12	F1	.185	3	.	.998	3	.923
	F2	.301	3	.	.911	3	.423
	F3	.208	3	.	.992	3	.827

a. Lilliefors Significance Correction

**Friedman Test
Test Statistics^a**

N	9
Chi-Square	30.101
df	4
Asym. Sig.	.000

a. Friedman Test

Test Statistics^a

	Hari_3 - Hari_0	Hari_6 - Hari_0	Hari_9 - Hari_0	Hari_12 - Hari_0	Hari_6 - Hari_3	Hari_9 - Hari_3	Hari_12 - Hari_3	Hari_9 - Hari_6	Hari_12 - Hari_6	Hari_12 - Hari_9
Z	-2.666 ^b	-2.666 ^b	-2.666 ^b	-2.666 ^b	-2.524 ^b	-2.666 ^b	-2.666 ^b	-2.075 ^b	-1.955 ^b	-1.007 ^b
Asymp. Sig. (2-tailed)	.008	.008	.008	.008	.012	.008	.008	.038	.051	.314

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Lampiran 8.4. Analisis Statistik terhadap Uji Pelepasan GSNO

Tests of Normality

	Formula	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Drug Release	F1	.296	3	.	.919	3	.448
	F2	.176	3	.	1.000	3	.976
	F3	.333	3	.	.861	3	.272

a. Lilliefors Significance Correction

Oneway

ANOVA

Drug Release

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	189.302	2	94.651	1835.231	.000
Within Groups	.309	6	.052		
Total	189.612	8			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Drug Release

Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I- J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
F1	F2	8.75333*	.18543	.000	8.1844	9.3223
	F3	10.47467*	.18543	.000	9.9057	11.0436
F2	F1	-8.75333*	.18543	.000	-9.3223	-8.1844
	F3	1.72133*	.18543	.000	1.1524	2.2903
F3	F1	-10.47467*	.18543	.000	-11.0436	-9.9057
	F2	-1.72133*	.18543	.000	-2.2903	-1.1524

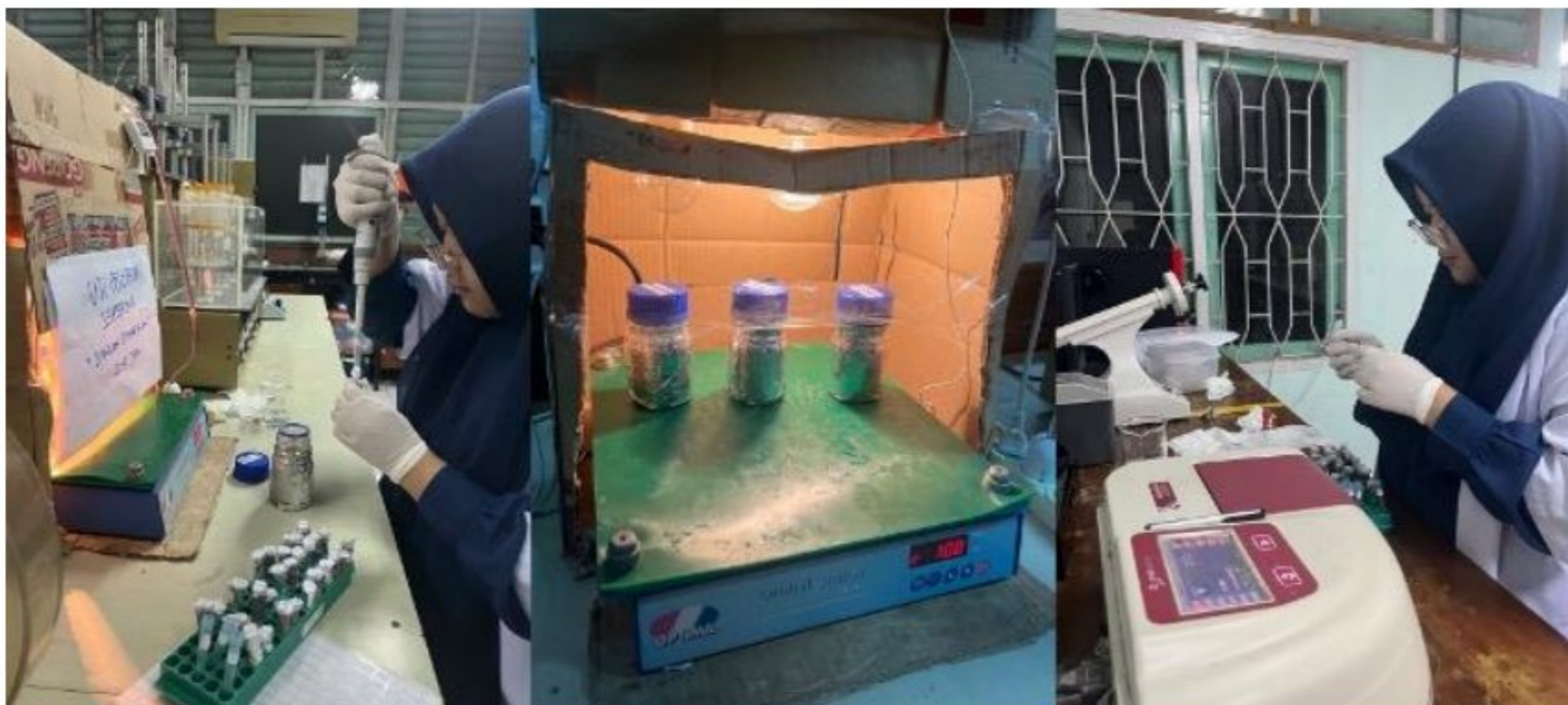
*. The mean difference is significant at the 0.05 level.

Lampiran 9. Dokumentasi Penelitian



Gambar 18. Hasil Pengukuran pH

Gambar 19. (a). Hasil Sintesis GSNO, (b). Formulasi sediaan film *anti-acne*Gambar 20. Uji Stabilitas pengukuran *drug loading*



Gambar 21. Uji Pelepasan Obat