

Lampiran. 6. Contoh perhitungan viskositas

No	Sampel	Waktu alir (tx-ty)	Waktu Alir rata-rata (s)	Viskositas (cSt)
1.	Biodiesel	00:12" ₃₀	00:12" ₂₅	3,5238
		00:12" ₂₀		
		00:12" ₂₅		
2.	Air	00:2" ₂₈	00:2" ₂₉	0,653
		00:2" ₃₀		
		00:2" ₂₉		

Viskositas Biodiesel :

$$\frac{\eta_1}{\eta_2} = \frac{t_1 \cdot \rho_1}{t_2 \rho_2}$$

$$\frac{0,653}{\eta_2} = \frac{2,29 \text{ s} \times 0,994 \text{ g/ml}}{12,25 \text{ s} \times 0,8774 \text{ g/ml}}$$

$$\eta_2 = 3,0918 \text{ cP}$$

$$\eta_2 = \frac{3,0918 \text{ cP}}{0,8774 \text{ g/ml}}$$

$$= 3,5238 \text{ cSt}$$

Lampiran. 7. Pembuatan biodiesel

Perlakuan	Suhu (°C)	Waktu Reaksi (Menit)	Minyak (g)	Metanol (g)	NaOH (g)	Biodiesel (g)	Gliserol (g)	Biodiesel (%)
P ₁	60	60	100	13	0,5	61,272	43,278	61,2
P ₂	60	60	100	13	1	63,994	37,728	63,9
P ₃	60	60	100	13	1,5	42,324	67,676	42,3
P ₄	60	60	100	13	2	31,376	78,624	31,3
P ₅	60	60	100	18	1	90,378	18,417	90,3
P ₆	60	60	100	23	1	93,695	16,305	93,6
P ₇	60	30	100	28	1	52,356	50,232	52,3
P ₈	60	60	100	28	1	98,656	11,344	98,6
P ₉	60	90	100	28	1	38,764	71,236	38,7
P ₁₀	60	120	100	28	1	55,726	45,816	55,7
P ₁₁	30	60	100	13	1	45,232	64,768	45,2
P ₁₂	40	60	100	13	1	51,358	58,642	51,3
P ₁₃	50	60	100	13	1	55,360	52,64	55,3
P ₁₄	60	60	100	13	1	65,273	40,252	65,2
P ₁₅	70	60	100	13	1	52,453	50,272	52,4
P ₁₆	50	90	100	8	2	21,478	88,522	21,4
P ₁₇	40	120	100	8	2	12,683	97,317	12,6

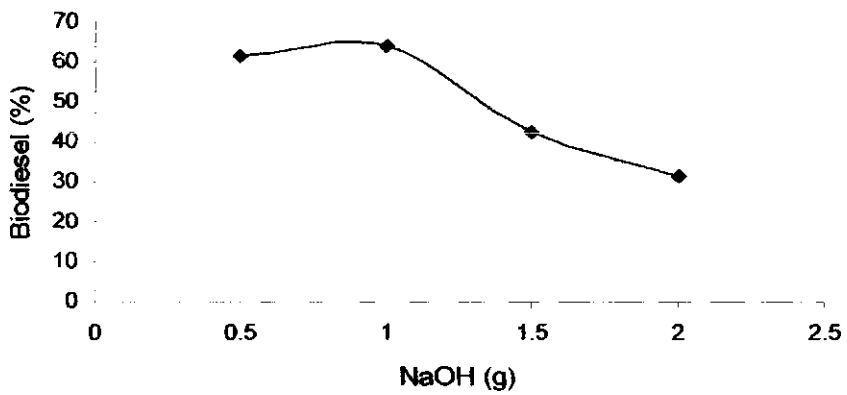
Lampiran. 8. Contoh perhitungan residu karbon

	Berat cawan kosong (g)	Berat biodiesel (g)	Berat cawan dan biodiesel sebelum pemanasan (g)	Berat cawan dan biodiesel setelah pemanasan (g)	Berat arang (g)	Kadar residu karbon (%)
o	37,1425	10,0267	47,1692	37,1456	0,0031	0,03

$$\begin{aligned} \text{Kadar Residu Karbon} &= \frac{0,0031 \times 100\%}{10,0267} \\ &= \mathbf{0,03\%} \end{aligned}$$

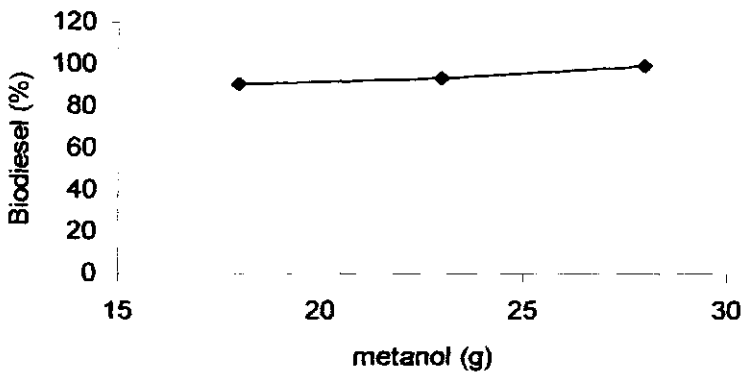
Lampiran 9. Grafik pengaruh variasi penambahan NaOH

NaOH (g)	Biodiesel (%)
0.5	61.272
1	63.994
1.5	42.324
2	31.376



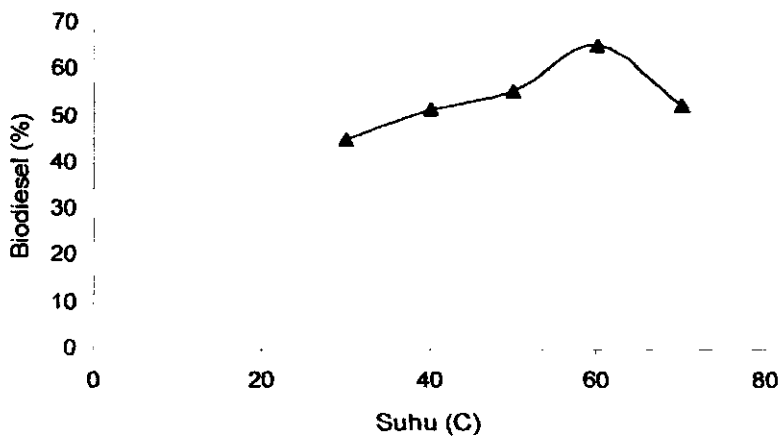
Lampiran 10. Grafik pengaruh variasi penambahan metanol

Metanol (g)	Biodiesel (%)
18	90.378
23	93.695
28	98.656



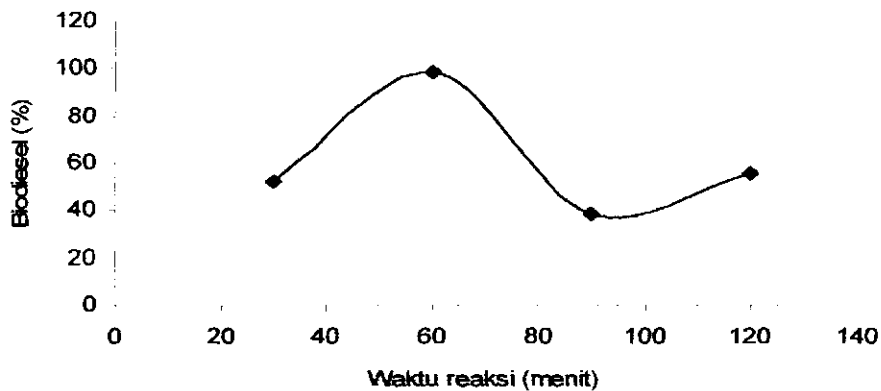
Lampiran 11. Grafik pengaruh kenaikan suhu

Suhu (°C)	Biodiesel (%)
30	45.232
40	51.358
50	55.36
60	65.273
70	52.453



Lampiran 12. Grafik pengaruh waktu reaksi

Waktu reaksi (menit)	biodiesel (%)
30	52.356
60	98.656
90	38.764
120	55.726



Lampiran 13. Gambar pembuatan biodiesel



MINYAK KELAPA



PROSES TRANSESTERIFIKASI



**PEMISAHAN BODIESEL
DENGAN GLISEROL**



GLISEROL



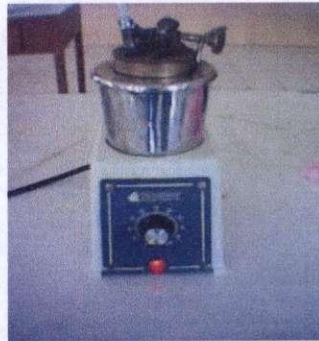
BODIESEL (SEBELUM DICUCI)



PENCUCIAN BODIESEL



BIODIESEL SETELAH DICUCI



TAG CLOSE TESTER



TAG CLOSE TESTER



RESIDU KARBON