

LAMPIRAN

Hasil Pengamatan

Tabel Analisa Sifat Fisik Minyak Biji Jarak

Variabel	Variabel Berubah		Rendemen %	Kadar Air %	Densitas (gr/ml)	Viskositas
	Waktu Pemanasan Awal (menit)	Ukuran Partikel				
1	15	± 2 cm	16,54	1,2	0,912	17,41
2	15	± 1 cm	17,07	1	0,908	25,04
3	15	≤ 1 cm	18,45	0,6	0,902	33,81
4	30	± 2 cm	19,50	1,2	0,909	17,52
5	30	± 1 cm	19,88	0,8	0,904	26,49
6	30	≤ 1 cm	19,95	0,4	0,899	35,60
7	45	± 2 cm	20,40	1	0,907	18,10
8	45	± 1 cm	20,69	0,4	0,903	29,74
9	45	≤ 1 cm	20,88	0,2	0,896	36,41

Tabel Analisa Sifat Kimia Minyak Biji Jarak

Variabel	Variabel Berubah		Angka Asam	Angka Penyabunan
	Waktu Pemanasan Awal (menit)	Ukuran Partikel		
1	15	± 2 cm	3,03	188,50
2	15	± 1 cm	3,25	190,18
3	15	≤ 1 cm	3,70	192,42
4	30	± 2 cm	3,14	189,06
5	30	± 1 cm	3,37	191,30
6	30	≤ 1 cm	3,81	192,98
7	45	± 2 cm	3,25	189,62
8	45	± 1 cm	3,48	191,86
9	45	≤ 1 cm	3,93	193,55

Hasil Perhitungan Pengujian Alat

1. Persentase Rendemen

$$\% \text{ Rendemen} = \frac{\text{massa minyak yang terekstrak (gr)}}{\text{massa sampel (gr)}} \times 100 \%$$

$$\text{Variabel 1} = \frac{33,08 \text{ gr}}{200 \text{ gr}} \times 100 \% = 16,54 \%$$

$$\text{Variabel 2} = \frac{34,13 \text{ gr}}{200 \text{ gr}} \times 100 \% = 17,07 \%$$

$$\text{Variabel 3} = \frac{36,9 \text{ gr}}{200 \text{ gr}} \times 100 \% = 18,45 \%$$

$$\text{Variabel 4} = \frac{39 \text{ gr}}{200 \text{ gr}} \times 100 \% = 19,50 \%$$

$$\text{Variabel 5} = \frac{39,76 \text{ gr}}{200 \text{ gr}} \times 100 \% = 19,88 \%$$

$$\text{Variabel 6} = \frac{39,9 \text{ gr}}{200 \text{ gr}} \times 100 \% = 19,95 \%$$

$$\text{Variabel 7} = \frac{40,79 \text{ gr}}{200 \text{ gr}} \times 100 \% = 20,40 \%$$

$$\text{Variabel 8} = \frac{41,38 \text{ gr}}{200 \text{ gr}} \times 100 \% = 20,69 \%$$

$$\text{Variabel 9} = \frac{41,76 \text{ gr}}{200 \text{ gr}} \times 100 \% = 20,88 \%$$

2. Kadar Air Minyak Biji Jarak Pagar

$$\rho = \frac{(\text{massa minyak awal} - \text{massa minyak setelah dipanaskan}) \text{ gr}}{\text{massa minyak awal (ml)}}$$

$$\text{Variabel 1} = \frac{(5 - 4,94) \text{ gr}}{5 \text{ gr}} = 1,2 \text{ gr/ml}$$

$$\text{Variabel 2} = \frac{(5 - 4,95) \text{ gr}}{5 \text{ gr}} = 1 \text{ gr/ml}$$

$$\text{Variabel 3} = \frac{(5 - 4,97) \text{ gr}}{5 \text{ gr}} = 0,6 \text{ gr/ml}$$

$$\text{Variabel 4} = \frac{(5 - 4,94) \text{ gr}}{5 \text{ gr}} = 1,2 \text{ gr/ml}$$

$$\text{Variabel 5} = \frac{(5 - 4,96) \text{ gr}}{5 \text{ gr}} = 0,8 \text{ gr/ml}$$

$$\text{Variabel 6} = \frac{(5 - 4,98) \text{ gr}}{5 \text{ gr}} = 0,4 \text{ gr/ml}$$

$$\text{Variabel 7} = \frac{(5 - 4,95) \text{ gr}}{5 \text{ gr}} = 1 \text{ gr/ml}$$

$$\text{Variabel 8} = \frac{(5-4,98)gr}{5 gr} = 0,4 \text{ gr/ml}$$

$$\text{Variabel 9} = \frac{(5-4,99)gr}{5 gr} = 0,2 \text{ gr/ml}$$

3. Densitas Minyak Biji Jarak Pagar

$$\rho = \frac{(\text{massa pikno isi minyak} - \text{massa pikno kosong})gr}{\text{volume pikno yang digunakan (ml)}}$$

$$\text{Variabel 1} = \frac{(38,01 - 15,21)gr}{25 ml} = 0,912 \text{ gr/ml}$$

$$\text{Variabel 2} = \frac{(37,91 - 15,21)gr}{25 ml} = 0,908 \text{ gr/ml}$$

$$\text{Variabel 3} = \frac{(37,75 - 15,21)gr}{25 ml} = 0,902 \text{ gr/ml}$$

$$\text{Variabel 4} = \frac{(37,94 - 15,21)gr}{25 ml} = 0,909 \text{ gr/ml}$$

$$\text{Variabel 5} = \frac{(37,81 - 15,21)gr}{25 ml} = 0,904 \text{ gr/ml}$$

$$\text{Variabel 6} = \frac{(37,69 - 15,21)gr}{25 ml} = 0,899 \text{ gr/ml}$$

$$\text{Variabel 7} = \frac{(37,89 - 15,21)gr}{25 ml} = 0,907 \text{ gr/ml}$$

$$\text{Variabel 8} = \frac{(37,79 - 15,21)gr}{25 ml} = 0,903 \text{ gr/ml}$$

$$\text{Variabel 9} = \frac{(37,6 - 15,21)gr}{25 ml} = 0,896 \text{ gr/ml}$$

4. Viskositas Minyak Biji Jarak

$$i_x = \frac{t_x d_x}{t_0 d_0} \cdot i_0$$

$$\text{Variabel 1} = \frac{22,82 s \times 0,910 \text{ gr/ml}}{1,2 s \times 0,998 \text{ gr/ml}} \cdot 1,004 \text{ cP} = 17,41 \text{ gr/ml}$$

$$\text{Variabel 2} = \frac{32,82 s \times 0,910 \text{ gr/ml}}{1,2 s \times 0,998 \text{ gr/ml}} \cdot 1,004 \text{ cP} = 25,04 \text{ gr/ml}$$

$$\text{Variabel 3} = \frac{44,32 \text{ s x } 0,910 \text{ gr/ml}}{1,2 \text{ s x } 0,998 \text{ gr/ml}} \cdot 1,004 \text{ cP} = 33,81 \text{ gr/ml}$$

$$\text{Variabel 4} = \frac{22,97 \text{ s x } 0,910 \text{ gr/ml}}{1,2 \text{ s x } 0,998 \text{ gr/ml}} \cdot 1,004 \text{ cP} = 17,52 \text{ gr/ml}$$

$$\text{Variabel 5} = \frac{34,72 \text{ s x } 0,910 \text{ gr/ml}}{1,2 \text{ s x } 0,998 \text{ gr/ml}} \cdot 1,004 \text{ cP} = 26,49 \text{ gr/ml}$$

$$\text{Variabel 6} = \frac{46,66 \text{ s x } 0,910 \text{ gr/ml}}{1,2 \text{ s x } 0,998 \text{ gr/ml}} \cdot 1,004 \text{ cP} = 35,60 \text{ gr/ml}$$

$$\text{Variabel 7} = \frac{23,732 \text{ s x } 0,910 \text{ gr/ml}}{1,2 \text{ s x } 0,998 \text{ gr/ml}} \cdot 1,004 \text{ cP} = 18,10 \text{ gr/ml}$$

$$\text{Variabel 8} = \frac{38,98 \text{ s x } 0,910 \text{ gr/ml}}{1,2 \text{ s x } 0,998 \text{ gr/ml}} \cdot 1,004 \text{ cP} = 29,74 \text{ gr/ml}$$

$$\text{Variabel 9} = \frac{47,72 \text{ s x } 0,910 \text{ gr/ml}}{1,2 \text{ s x } 0,998 \text{ gr/ml}} \cdot 1,004 \text{ cP} = 36,41 \text{ gr/ml}$$

5. Angka Asam Minyak biji jarak

$$\text{Rumus} = \frac{56,1 \text{ x ml KOH yang dibutuhkan x normalitas KOH}}{\text{massa sampel (gr)}}$$

$$\text{Variabel 1} = \frac{56,1 \text{ x } 2,7 \text{ ml x } 0,1 \text{ N}}{5 \text{ gr}} = 3,03$$

$$\text{Variabel 2} = \frac{56,1 \text{ x } 2,9 \text{ ml x } 0,1 \text{ N}}{5 \text{ gr}} = 3,25$$

$$\text{Variabel 3} = \frac{56,1 \text{ x } 3,3 \text{ ml x } 0,1 \text{ N}}{5 \text{ gr}} = 3,70$$

$$\text{Variabel 4} = \frac{56,1 \text{ x } 2,8 \text{ ml x } 0,1 \text{ N}}{5 \text{ gr}} = 3,14$$

$$\text{Variabel 5} = \frac{56,1 \text{ x } 3 \text{ ml x } 0,1 \text{ N}}{5 \text{ gr}} = 3,37$$

$$\text{Variabel 6} = \frac{56,1 \text{ x } 3,4 \text{ ml x } 0,1 \text{ N}}{5 \text{ gr}} = 3,81$$

$$\text{Variabel 7} = \frac{56,1 \text{ x } 2,9 \text{ ml x } 0,1 \text{ N}}{5 \text{ gr}} = 3,25$$

$$\text{Variabel 8} = \frac{56,1 \text{ x } 3,1 \text{ ml x } 0,1 \text{ N}}{5 \text{ gr}} = 3,48$$

$$\text{Variabel 9} = \frac{56,1 \times 3,5 \text{ ml} \times 0,1 \text{ N}}{5 \text{ gr}} = 3,93$$

6. Angka Penyabunan

$$\text{Rumus} = \frac{(\text{titrasi blanko} - \text{titrasi sampel}) \text{ ml} \times \text{N HCl} \times 56,1}{\text{massa sampel (gr)}}$$

$$\text{Variabel 1} = \frac{(36 - 2,4) \text{ ml} \times 0,5 \text{ N HCl} \times 56,1}{5 \text{ gr}} = 188,50$$

$$\text{Variabel 2} = \frac{(36 - 2,1) \text{ ml} \times 0,5 \text{ N HCl} \times 56,1}{5 \text{ gr}} = 190,18$$

$$\text{Variabel 3} = \frac{(36 - 1,7) \text{ ml} \times 0,5 \text{ N HCl} \times 56,1}{5 \text{ gr}} = 192,42$$

$$\text{Variabel 4} = \frac{(36 - 2,3) \text{ ml} \times 0,5 \text{ N HCl} \times 56,1}{5 \text{ gr}} = 189,06$$

$$\text{Variabel 5} = \frac{(36 - 1,9) \text{ ml} \times 0,5 \text{ N HCl} \times 56,1}{5 \text{ gr}} = 191,30$$

$$\text{Variabel 6} = \frac{(36 - 1,6) \text{ ml} \times 0,5 \text{ N HCl} \times 56,1}{5 \text{ gr}} = 192,98$$

$$\text{Variabel 7} = \frac{(36 - 2,2) \text{ ml} \times 0,5 \text{ N HCl} \times 56,1}{5 \text{ gr}} = 189,62$$

$$\text{Variabel 8} = \frac{(36 - 1,8) \text{ ml} \times 0,5 \text{ N HCl} \times 56,1}{5 \text{ gr}} = 191,86$$

$$\text{Variabel 9} = \frac{(36 - 1,5) \text{ ml} \times 0,5 \text{ N HCl} \times 56,1}{5 \text{ gr}} = 193,55$$