

## LAMPIRAN

### 1. Hasil Pengamatan

1.1 Tabel 4. Hasil Volume Filtrat

Variabel		Pengamatan		Valve pengambilan filtrate (liter)		
Massa (kg)	H <sub>2</sub> O (liter)	Tekanan (kg/cm <sup>2</sup> )	Waktu (menit)	I	II	III
3	30	65	10	4,335	4,255	4,175
			20	4,210	4,133	4,085
		75	10	4,577	4,452	4,318
			20	4,47	4,326	4,295
		85	10	4,687	4,548	4,445
			20	4,553	4,438	4,314

**1.2 Tabel 5. Hasil Viskositas**

Variabel			Pengamatan	Viskositas Filtrat (cP)		
Massa (kg)	H <sub>2</sub> O (liter)	Tekanan (kg/cm <sup>2</sup> )	Waktu (menit)	I	II	III
3	30	65	10	25,427	25,100	24,966
			20	19,646	18,996	18,761
		75	10	21,221	20,880	20,581
			20	18,515	18,238	17,765
		85	10	20,237	19,993	19,781
			20	17,676	17,260	16,784

**1.3 Tabel 6. Hasil Cake Basah**

Variabel			Pengamatan	Berat Cake Basah (gr)		
Tekanan (kg/cm <sup>2</sup> )	Massa (kg)	H <sub>2</sub> O (liter)	Waktu (menit)	I	II	III
65	3	30	10	68,21	64,12	52,04
			20	94,61	79,51	68,38
75	3	30	10	75,93	67,01	61,73
			20	105,27	93,40	77,73
85	3	30	10	83,95	71,02	62,31
			20	112,21	103,62	91,09

1.4 Tabel 7. Hasil Cake Kering

Variabel		Pengamatan		Berat Cake Kering (gr)		
Tekanan (kg/cm <sup>2</sup> )	Massa (kg)	H <sub>2</sub> O (liter)	Waktu (menit)	I	II	III
65			10	65,47	54,00	46,52
			20	83,23	72,96	62,06
75	3	30	10	71,05	61,66	54,16
			20	91,36	84,68	70,47
85			10	73,23	59,82	50,20
			20	96,65	91,49	77,04

## 2. Perhitungan

### - Densitas dan Viskositas

- berat piknometer kosong = 17,10 gr
- volume piknometer = 25 ml

$$\bullet \rho = \frac{\text{berat piknometer isi} - \text{berat piknometer kosong}}{\text{volume piknometer}}$$

$$\bullet \mu_x = \frac{t_x \times \rho_x}{t_0 \times \rho_0} \times \mu_0$$

### a. Variabel 1 (10 menit)

#### ➤ Tekanan 65 kg/cm<sup>2</sup>

$$\begin{aligned} - \rho_1 &= \frac{(43,99 - 17,10) \text{ gr}}{25 \text{ ml}} \\ \rho_1 &= 1,076 \text{ gr/ml} \end{aligned}$$

$$\begin{aligned} - \mu_1 &= \frac{23,64 \text{ s} \times 1,076 \text{ gr/ml}}{1 \times 1} \times 1 \\ \mu_1 &= 25,427 \text{ cP} \end{aligned}$$

$$\begin{aligned} - \rho_2 &= \frac{(43,87 - 17,10) \text{ gr}}{25 \text{ ml}} \\ \rho_2 &= 1,071 \text{ gr/ml} \end{aligned}$$

$$\begin{aligned} - \mu_2 &= \frac{23,44 \text{ s} \times 1,071 \text{ gr/ml}}{1 \times 1} \times 1 \\ \mu_2 &= 25,100 \text{ cP} \end{aligned}$$

$$\begin{aligned} - \rho_3 &= \frac{(43,75 - 17,10) \text{ gr}}{25 \text{ ml}} \\ \rho_3 &= 1,066 \text{ gr/ml} \end{aligned}$$

$$\begin{aligned} - \mu_3 &= \frac{23,42 \text{ s} \times 1,066 \text{ gr/ml}}{1 \times 1} \times 1 \\ \mu_3 &= 24,966 \text{ cP} \end{aligned}$$

➤ **Tekanan 75 kg/cm<sup>2</sup>**

$$\rho_1 = \frac{(43,68 - 17,10) \text{ gr}}{25 \text{ ml}}$$

$$\rho_1 = 1,063 \text{ gr/ml}$$

$$\rho_2 = \frac{(43,57 - 17,10) \text{ gr}}{25 \text{ ml}}$$

$$\rho_2 = 1,059 \text{ gr/ml}$$

$$\rho_3 = \frac{(43,50 - 17,10) \text{ gr}}{25 \text{ ml}}$$

$$\rho_3 = 1,056 \text{ gr/ml}$$

$$\mu_1 = \frac{19,96 \text{ s} \times 1,063 \text{ gr/ml}}{1 \times 1} \times 1$$

$$\mu_1 = 21,221 \text{ cP}$$

$$\mu_2 = \frac{19,72 \text{ s} \times 1,059 \text{ gr/ml}}{1 \times 1} \times 1$$

$$\mu_2 = 20,880 \text{ cP}$$

$$\mu_3 = \frac{19,49 \text{ s} \times 1,056 \text{ gr/ml}}{1 \times 1} \times 1$$

$$\mu_3 = 20,581 \text{ cP}$$

➤ **Tekanan 85 kg/cm<sup>2</sup>**

$$\rho_1 = \frac{(43,45 - 17,10) \text{ gr}}{25 \text{ ml}}$$

$$\rho_1 = 1,054 \text{ gr/ml}$$

$$\rho_2 = \frac{(43,31 - 17,10) \text{ gr}}{25 \text{ ml}}$$

$$\rho_2 = 1,048 \text{ gr/ml}$$

$$\rho_3 = \frac{(43,28 - 17,10) \text{ gr}}{25 \text{ ml}}$$

$$\rho_3 = 1,047 \text{ gr/ml}$$

$$\mu_1 = \frac{19,20 \text{ s} \times 1,054 \text{ gr/ml}}{1 \times 1} \times 1$$

$$\mu_1 = 20,237 \text{ cP}$$

$$\mu_2 = \frac{19,07 \text{ s} \times 1,048 \text{ gr/ml}}{1 \times 1} \times 1$$

$$\mu_2 = 19,993 \text{ cP}$$

$$\mu_3 = \frac{18,89 \text{ s} \times 1,047 \text{ gr/ml}}{1 \times 1} \times 1$$

$$\mu_3 = 19,782 \text{ cP}$$

**b. Variabel 2 (20 menit)**

➤ **Tekanan 65 kg/cm<sup>2</sup>**

$$\rho_1 = \frac{(43,17 - 17,10) \text{ gr}}{25 \text{ ml}}$$

$$\rho_1 = 1,042 \text{ gr/ml}$$

$$\rho_2 = \frac{(42,91 - 17,10) \text{ gr}}{25 \text{ ml}}$$

$$\rho_2 = 1,032 \text{ gr/ml}$$

$$\rho_3 = \frac{(42,80 - 17,10) \text{ gr}}{25 \text{ ml}}$$

$$\rho_3 = 1,028 \text{ gr/ml}$$

$$\mu_1 = \frac{18,84 \text{ s} \times 1,042 \text{ gr/ml}}{1 \times 1} \times 1$$

$$\mu_1 = 19,646 \text{ cP}$$

$$\mu_2 = \frac{18,40 \text{ s} \times 1,032 \text{ gr/ml}}{1 \times 1} \times 1$$

$$\mu_2 = 18,996 \text{ cP}$$

$$\mu_3 = \frac{18,25 \text{ s} \times 1,028 \text{ gr/ml}}{1 \times 1} \times 1$$

$$\mu_3 = 18,761 \text{ cP}$$

➤ **Tekanan 75 kg/cm<sup>2</sup>**

$$\rho_1 = \frac{(42,73 - 17,10) \text{ gr}}{25 \text{ ml}}$$

$$\rho_1 = 1,025 \text{ gr/ml}$$

$$\rho_2 = \frac{(42,60 - 17,10) \text{ gr}}{25 \text{ ml}}$$

$$\rho_2 = 1,020 \text{ gr/ml}$$

$$\mu_1 = \frac{18,06 \text{ s} \times 1,025 \text{ gr/ml}}{1 \times 1} \times 1$$

$$\mu_1 = 18,515 \text{ cP}$$

$$\mu_2 = \frac{17,88 \text{ s} \times 1,020 \text{ gr/ml}}{1 \times 1} \times 1$$

$$\mu_2 = 18,238 \text{ cP}$$

$$\rho_3 = \frac{(42,42-17,10)gr}{25 ml}$$

$$\rho_3 = 1,013 gr/ml$$

$$\mu_3 = \frac{17,54 s \times 1,013 gr/ml}{1 \times 1} \times 1$$

$$\mu_3 = 17,766 cP$$

➤ **Tekanan 85 kg/cm<sup>2</sup>**

$$\rho_1 = \frac{(42,38-17,10)gr}{25 ml}$$

$$\rho_1 = 1,011 gr/ml$$

$$\mu_1 = \frac{17,48 s \times 1,011 gr/ml}{1 \times 1} \times 1$$

$$\mu_1 = 17,676 cP$$

$$\rho_2 = \frac{(42,26-17,10)gr}{25 ml}$$

$$\rho_2 = 1,006 gr/ml$$

$$\mu_2 = \frac{17,15 s \times 1,006 gr/ml}{1 \times 1} \times 1$$

$$\mu_2 = 17,260 cP$$

$$\rho_3 = \frac{(42,18-17,10)gr}{25 ml}$$

$$\rho_3 = 1,003 gr/ml$$

$$\mu_3 = \frac{16,73 s \times 1,003 gr/ml}{1 \times 1} \times 1$$

$$\mu_3 = 16,784 cP$$

- **Cake Basah dan Cake Kering**

- *Berat Basah = (Berat cawan porselin + Cake basah) – Berat cawan porselin kosong*
- *Berat Kering = (Berat cawan porselin + Cake kering) – Berat cawan porselin kosong*

**a. Variabel 1 (10 menit)**

➤ **Tekanan 65 kg/cm<sup>2</sup>**

• **Cake Basah**

$$\text{- Berat basah 1} = (112,63 - 44,42)gr$$

$$= 68,21 gr$$

$$\text{- Berat basah 2} = (108,89 - 44,77)gr$$

$$= 64,12 gr$$

$$\text{- Berat basah 3} = (96,87 - 44,83)gr$$

$$= 52,04 gr$$

• **Cake Kering**

$$\text{- Berat kering 1} = (109,89 - 44,42)gr$$

$$= 65,47 gr$$

$$\text{- Berat kering 2} = (98,77 - 44,77)gr$$

$$= 54,00 gr$$

$$\text{- Berat kering 3} = (91,35 - 44,83)gr$$

$$= 46,52 gr$$

➤ **Tekanan 75 kg/cm<sup>2</sup>**

• **Cake Basah**

$$\text{- Berat basah 1} = (120,35 - 44,42)gr$$

$$= 75,93 gr$$

$$\text{- Berat basah 2} = (111,78 - 44,77)gr$$

$$= 67,01 gr$$

$$\text{- Berat basah 3} = (106,56 - 44,83)gr$$

$$= 61,73 gr$$

• **Cake Kering**

$$\text{- Berat kering 1} = (115,47 - 44,42)gr$$

$$= 71,05 gr$$

$$\text{- Berat kering 2} = (106,43 - 44,77)gr$$

$$= 61,66 gr$$

$$\text{- Berat kering 3} = (98,99 - 44,83)gr$$

$$= 54,16 gr$$

➤ **Tekanan 85 kg/cm<sup>2</sup>**

• Cake Basah

- Berat basah 1 =  $(128,37 - 44,42)$ gr  
= 83,95 gr
- Berat basah 2 =  $(115,79 - 44,77)$ gr  
= 71,02 gr
- Berat basah 3 =  $(107,14 - 44,83)$ gr  
= 62,31 gr

• Cake Kering

- Berat kering 1 =  $(117,65 - 44,42)$ gr  
= 73,23 gr
- Berat kering 2 =  $(104,59 - 44,77)$ gr  
= 59,82 gr
- Berat kering 3 =  $(95,03 - 44,83)$ gr  
= 50,20 gr

**b. Variabel 2 (20 menit)**

➤ **Tekanan 65 kg/cm<sup>2</sup>**

• Cake Basah

- Berat basah 1 =  $(139,03 - 44,42)$ gr  
= 94,61 gr
- Berat basah 2 =  $(124,28 - 44,77)$ gr  
= 79,51 gr
- Berat basah 3 =  $(113,21 - 44,83)$ gr  
= 68,38 gr

• Cake Kering

- Berat kering 1 =  $(127,65 - 44,42)$ gr  
= 83,23 gr
- Berat kering 2 =  $(117,73 - 44,77)$ gr  
= 72,96 gr
- Berat kering 3 =  $(106,89 - 44,83)$ gr  
= 62,06 gr

➤ **Tekanan 75 kg/cm<sup>2</sup>**

• Cake Basah

- Berat basah 1 =  $(149,69 - 44,42)$ gr  
= 105,27 gr
- Berat basah 2 =  $(138,17 - 44,77)$ gr  
= 93,40 gr
- Berat basah 3 =  $(122,56 - 44,83)$ gr  
= 77,73 gr

• Cake Kering

- Berat kering 1 =  $(135,78 - 44,42)$ gr  
= 91,36 gr
- Berat kering 2 =  $(129,45 - 44,77)$ gr  
= 84,68 gr
- Berat kering 3 =  $(115,30 - 44,83)$ gr  
= 70,47 gr

➤ **Tekanan 85 kg/cm<sup>2</sup>**






• Cake Basah

- Berat basah 1 =  $(156,63 - 44,42)$ gr  
= 112,21 gr
- Berat basah 2 =  $(148,39 - 44,77)$ gr  
= 103,62 gr
- Berat basah 3 =  $(135,92 - 44,83)$ gr  
= 91,09 gr

• Cake Kering

- Berat kering 1 =  $(141,07 - 44,42)$ gr  
= 96,65 gr
- Berat kering 2 =  $(136,26 - 44,77)$ gr  
= 91,49 gr
- Berat kering 3 =  $(121,87 - 44,83)$ gr  
= 77,04 gr

**3. Foto**

Foto	Keterangan
	Temulawak yang sudah dihaluskan
	Pengukuran volume filtrat
	Pengukuran viskositas filtrat
	Cake Basah
	Cake Kering