LAMPIRAN

Berikut data hasil analisa pada proses filtrasi yang tersaji pada tabel 5 dibawah ini.

Tabel 9. Hasil Pengamatan Praktikum

Volume Filtrat	Volume Filtrat	Variabel 1 (PAC 71,7 gr/ml)		Variabel 2 (PAC 100 gr/ml)		Variabel 3 (PAC 128,3 gr/ml)	
(V, Liter)	(V, m^3)	(t, detik)	(t/V)	(t, detik)	(t/V)	(t, detik)	(t/V)
0	0	0,00	0,00	0,00	0,00	0,00	0,00
5	0,005	104,94	20.988	103,67	20.734	102,40	20.479
10	0,01	166,67	16.667	164,68	16.467,50	162,68	16.267,50
15	0,015	228,14	15.209,33	225,87	15.057,67	223,59	14.906
20	0,02	326,73	16.336,50	325,54	16.276,75	324,34	16.216,75
25	0,025	530,17	21.206,60	528,94	21.157,40	527,70	21.107,80
30	0,03	825,50	27.516,50	823,50	27.449,83	821,49	27.383

a. Perhitungan Analisa

1. Densitas (ρ)

$$\rho = \frac{\text{massa piknometer isi} - \text{massa piknometer kosong}}{\text{volume piknometer}} \quad \text{..... (6)}$$

Dimana ; ρ = massa jenis / densitas (gr/ml)

Tabel 10. Data Perhitungan Densitas

Uji	Massa Piknometer Isi (gr)	Massa Piknometer Kosong (gr)	Volume Piknometer (ml)
1.	41,51	16,84	25
2.	41,76	16,84	25
3.	41,69	16,84	25

a.) ρ1 (t=30 s) = $\rho = \frac{(41{,}51-16{,}84)\ gr}{25\ ml} = 0{,}9868\ gr/ml$

b.) ρ2 (t=30 s) = $\rho = \frac{(41{,}76-16{,}84)\ gr}{25\ ml} = 0{,}9968\ gr/ml$

c.) ρ3 (t=30 s) = $\rho = \frac{(41{,}69-16{,}84)\ gr}{25\ ml} = 0{,}994\ gr/ml$

2. Viskositas (μ)

$$\mu = \frac{tx \times \rho x}{t0 \times \rho 0} \times \mu_0 \quad \text{..... (7)}$$

Keterangan :

- μ_x : viskositas sampel (Cp)
- μ_0 : viskositas air (Cp)
- t_x : waktu sampel (s)
- t_0 : waktu air (s)
- ρ_x : densitas sampel (g/ml)
- ρ_0 : densitas air (g/ml)

Tabel 11. Data Perhitungan Viskositas

Uji	Densitas sampel (gr/ml)	Densitas air (gr/ml)	Waktu sampel (s)	Waktu air (s)
1.	0,9868	1	0,93	0,8
2.	0,9968	1	0,89	0,8
3.	0,994	1	0,83	0,8

a.) μ1 (t=30 s) = $\frac{0{,}93 \ x \ 0{,}9869 \ gr/ml}{0{,}8 \ x \ 1 \ gr/ml}$ x 1,002 cp = 1,149 cp

b.) μ2 (t=30 s) = $\frac{0{,}89 \ x \ 0{,}9968 \ gr/ml}{0{,}8 \ x \ 1 \ gr/ml}$ x 1,002 cp = 1,1 cp

c.) μ3 (t=30 s) = $\frac{0{,}83 \ x \ 0{,}994 \ gr/ml}{0{,}8 \ x \ 1 \ gr/ml}$ x 1,002 cp = 1,033 cp

3. Tahanan Medium Filter (Rm)

$$Rm = \frac{B \ A(-\Delta P)}{\mu} \quad \text{..... (8)}$$

Dimana :

R_m = tahanan medium filter (m^{-1})

C_s = (kg solid/m^3)

ΔP = *pressure drop* (N/m^2)

A = luas filter (m^2)

μ = viskositas (Pa.s)

K_p (s/m^6)

B (s/m^3)

Tabel 12. Data Perhitungan Tahanan Medium Filter (Rm)

Uji	B (s/m^6)	A (m^2)	ΔP (N/m^2)	μ (cp)
1.	5038	0,2209	6.864.655	1,149
2.	4876,8	0,2209	6.864.655	1,1
3.	4714,9	0,2209	6.864.655	1,033

a.) $Rm1 = \frac{(5038\ {}^{S}/_{m}6\ )\ x\ (0{,}2209\ m^2)\ x\ (6.864.655 N/m^2)}{(1{,}149\ \text{cp})}$ = 6.646.343.312 m^{-1}

b.) $Rm3 = \frac{(4876{,}8\ {}^{S}/_{m}6\ )\ x\ (0{,}2209\ m^2)\ x\ (6.864.655 N/m^2)}{(1{,}1\ \text{cp})}$ = 6.722.835.656 m^{-1}

c.) $Rm6 = \frac{(4714{,}9\ {}^{S}/_{m}6\ )\ x\ (0{,}2209\ m^2)\ x\ (6.864.655 N/m^2)}{(1{,}033\ \text{cp})}$ = 32.366.161.860 m^{-1}

1. Spesifik Cake (α)

$$\alpha = \frac{A^2(-\Delta P)Kp}{\mu Cs} \quad \text{..... (9)}$$

Dimana :

α= Spesifik cake (m/kg) μ = viskositas (Pa.s)

C_s = (kg solid/m^3)

ΔP = *pressure drop* (N/m^2) K_p ($^{S}/_{m^6}$)

A = luas filter (m^2) B ($^{S}/_{m^3}$)

Tabel 13. Data Perhitungan Tahanan Medium Filter (Rm)

Uji	Cs ($^{kg}/_{m^3}$)	A (m^2)	ΔP (N/m^2)	μ (cp)	K_p ($^{S}/_{m^6}$)
1	186,926	0,2209	6.864.655	1,149	5904
2	186,926	0,2209	6.864.655	1,1	5929
3	186,926	0,2209	6.864.655	1,033	5954

a.) $\alpha 1 = \frac{(0{,}2209\ )\ x\ (6.864.655) x\ (5904)}{(1{,}149) x (186{,}926)}$ = 9.204.434,926 m/kg

b.) $\alpha 3 = \frac{(0{,}2209)\ x\ (6.864.655)\ x\ (5929)}{(1{,}1)\ \ x (186{,}926)}$ = 9.658.844,518 m/kg

c.) $\alpha 6 = \frac{(0{,}2209)\ x\ (6.864.655)\ x\ (5954)}{(1{,}033) x (186{,}926)}$ = 10.325.408,1 m/kg

6. Filtration Flux (q)

$$q = \frac{V}{A\ x\ t} \quad \text{..... (10)}$$

dimana :

q = Filtration Flux (m/menit)

V = Volume (m^3)

A = Luas Permukaan (m^2)

t = waktu (menit)

Tabel 14. Data Perhitungan Filtration Flux Variabel 1

Variabel 1 (PAC 71,7 gr/ml)			
t (menit)	v (liter)	v (m^3)	A(m^2)
0	0	0	0,2209
5	19	0,019	0,2209
10	8,9	0,0089	0,2209
15	7,6	0,0076	0,2209
20	6,5	0,0065	0,2209
25	5,2	0,0052	0,2209
30	4,5	0,0045	0,2209

$q0 = \frac{0}{0{,}2209\ x\ 0}$ = 0 m/menit

$q5 = \frac{0{,}019}{0{,}2209\ x\ 5}$ = 0,0172 m/menit

$q10 = \frac{0{,}0089}{0{,}2209\ x\ 10}$ = 0,00403 m/menit

$q15 = \frac{0{,}0076}{0{,}2209\ x 15}$ = 0,00229 m/menit

$q20 = \frac{0{,}0065}{0{,}2209\ x 20}$ = 0,00147 m/menit

$q25 = \frac{0{,}0052}{0{,}2209\ x 25}$ = 0,00094 m/menit

$q30 = \frac{0{,}0045}{0{,}2209\ x\ 30}$ = 0,00068 m/menit

Tabel 15. Data Perhitungan Filtration Flux Variabel 2

Variabel 2 (PAC 100 gr/ml)			
t (menit)	v (liter)	v (m^3)	A(m^2)
0	0	0	0,2209
5	17	0,017	0,2209
10	10,4	0,0104	0,2209
15	8,8	0,0088	0,2209
20	6,7	0,0067	0,2209
25	6	0,006	0,2209
30	5,4	0,0054	0,2209

$q0 = \frac{0}{0{,}2209\ x\ 0}$ = 0 m/menit

$q5 = \frac{0{,}017}{0{,}2209\ x\ 5}$ = 0,01539 m/menit

$q10 = \frac{0{,}0104}{0{,}2209\ x\ 10}$ = 0,00471 m/menit

$q15 = \frac{0{,}0088}{0{,}2209\ x15}$ = 0,00266 m/menit

$q20 = \frac{0{,}0067}{0{,}2209\ x20}$ = 0,00152 m/menit

$q25 = \frac{0{,}006}{0{,}2209\ x25}$ = 0,00109 m/menit

$q30 = \frac{0{,}0054}{0{,}2209\ x\ 30}$ = 0,00081 m/menit

Tabel16. Data Perhitungan Filtration Flux Variabel 3

Variabel 3 (PAC 128,3 gr/ml)			
t (menit)	v (liter)	v (m^3)	A(m^2)
0	0	0	0,2209
5	19,1	0,0191	0,2209
10	9,1	0,0091	0,2209
15	7,5	0,0075	0,2209
20	6,6	0,0066	0,2209
25	5,3	0,0053	0,2209
30	4,6	0,0046	0,2209

$q0 = \frac{0}{0{,}2209\ x\ 0}$ = 0 m/menit

$q5 = \frac{0{,}0191}{0{,}2209\ x\ 5}$ = 0,01729 m/menit

$q10 = \frac{0{,}0091}{0{,}2209\ x\ 10}$ = 0,00412 m/menit

$q15 = \frac{0{,}0075}{0{,}2209\ x15}$ = 0,00226 m/menit

$q20 = \frac{0{,}0066}{0{,}2209\ x20}$ = 0,00149 m/menit

$q25 = \frac{0{,}0053}{0{,}2209\ x25}$ = 0,00096 m/menit

$q30 = \frac{0{,}0046}{0{,}2209\ x\ 30}$ = 0,00069 m/menit

b. Foto

Gambar 1. Pengukuran lumpur baku

Gambar 2. Proses Filtrasi dengan alat Filter Press Plate and Frame

Gambar 3. Cake yang tertahan

Gambar 17. Hasil Filtrat pada Filter

Gambar 4. Cake Setelah Dioven

Gambar 5. Alat Untuk Uji Hasil Praktikum Filtrasi