

LAMPIRAN 1
PERHITUNGAN DATA PENELITIAN

A. Perhitungan Konversi Satuan

1. Karbon Monoksida (CO)

Diketahui : CO = 10.000 $\mu\text{g}/\text{m}^3$

Ditanya : Konversi $\mu\text{g}/\text{m}^3$ ke ppm

Penyelesaian : $1 \frac{\mu\text{g}}{\text{m}^3} = \frac{1}{24,45} \text{ ppm}$ atau $1 \text{ ppm} = 24,45 \times 1 \mu\text{g}/\text{m}^3$

Sehingga,

$$\begin{aligned} 10.000 \frac{\mu\text{g}}{\text{m}^3} &= 10.000 \times \frac{1}{24,45} \text{ ppm} \\ &= 408,9979550102 \text{ ppm} \\ &= 409 \text{ ppm} \end{aligned}$$

2. Sulfur Dioksida (SO₂)

Diketahui : SO₂ = 150 $\mu\text{g}/\text{m}^3$

Ditanya : Konversi $\mu\text{g}/\text{m}^3$ ke ppm

Penyelesaian : $1 \frac{\mu\text{g}}{\text{m}^3} = \frac{1}{24,45} \text{ ppm}$ atau $1 \text{ ppm} = 24,45 \times 1 \mu\text{g}/\text{m}^3$

Sehingga,

$$\begin{aligned} 150 \frac{\mu\text{g}}{\text{m}^3} &= 150 \times \frac{1}{24,45} \text{ ppm} \\ &= 6,1349693252 \text{ ppm} \\ &= 6,13 \text{ ppm} \end{aligned}$$

3. Nitrogen Dioksida (NO₂)

Diketahui : NO₂ = 200 $\mu\text{g}/\text{m}^3$

Ditanya : Konversi $\mu\text{g}/\text{m}^3$ ke ppm

Penyelesaian : $1 \frac{\mu\text{g}}{\text{m}^3} = \frac{1}{24,45} \text{ ppm}$ atau $1 \text{ ppm} = 24,45 \times 1 \mu\text{g}/\text{m}^3$

Sehingga,

$$200 \frac{\mu\text{g}}{\text{m}^3} = 200 \times \frac{1}{24,45} \text{ ppm}$$

$$= 8,1799591002 \text{ ppm}$$

$$= 8,18 \text{ ppm}$$

4. Oksidan Fotokimia (O_x) sebagai ozon (O_3)

Diketahui : $O_x = 150 \mu\text{g}/\text{m}^3$

Ditanya : Konversi $\mu\text{g}/\text{m}^3$ ke ppm

Penyelesaian : $1 \frac{\mu\text{g}}{\text{m}^3} = \frac{1}{24,45} \text{ ppm}$ atau $1 \text{ ppm} = 24,45 \times 1 \mu\text{g}/\text{m}^3$

Sehingga,

$$150 \frac{\mu\text{g}}{\text{m}^3} = 150 \times \frac{1}{24,45} \text{ ppm}$$

$$= 6,1349693252 \text{ ppm}$$

$$= 6,13 \text{ ppm}$$

5. Hidrokarbon Non Metana (NMHC)

Diketahui : NMHC = $160 \mu\text{g}/\text{m}^3$

Ditanya : Konversi $\mu\text{g}/\text{m}^3$ ke ppm

Penyelesaian : $1 \frac{\mu\text{g}}{\text{m}^3} = \frac{1}{24,45} \text{ ppm}$ atau $1 \text{ ppm} = 24,45 \times 1 \mu\text{g}/\text{m}^3$

Sehingga,

$$160 \frac{\mu\text{g}}{\text{m}^3} = 160 \times \frac{1}{24,45} \text{ ppm}$$

$$= 6,5439672802 \text{ ppm}$$

$$= 6,55 \text{ ppm}$$

6. PM_{10}

Diketahui : $PM_{10} = 75 \mu\text{g}/\text{m}^3$

Ditanya : Konversi $\mu\text{g}/\text{m}^3$ ke ppm

Penyelesaian : $1 \frac{\mu\text{g}}{\text{m}^3} = \frac{1}{24,45} \text{ ppm}$ atau $1 \text{ ppm} = 24,45 \times 1 \mu\text{g}/\text{m}^3$

Sehingga,

$$75 \frac{\mu\text{g}}{\text{m}^3} = 75 \times \frac{1}{24,45} \text{ ppm}$$

$$= 3,0674846626 \text{ ppm}$$

$$= 3,07 \text{ ppm}$$

7. PM_{2,5}

Diketahui : PM_{2,5} = 55 µg/m³

Ditanya : Konversi µg/m³ ke ppm

Penyelesaian : $1 \frac{\mu\text{g}}{\text{m}^3} = \frac{1}{24,45} \text{ ppm}$ atau $1 \text{ ppm} = 24,45 \times 1 \mu\text{g}/\text{m}^3$

Sehingga,

$$\begin{aligned} 55 \frac{\mu\text{g}}{\text{m}^3} &= 55 \times \frac{1}{24,45} \text{ ppm} \\ &= 2,2494887526 \text{ ppm} \\ &= 2,25 \text{ ppm} \end{aligned}$$

8. Timbal (Pb)

Diketahui : Pb = 2 µg/m³

Ditanya : Konversi µg/m³ ke ppm

Penyelesaian : $1 \frac{\mu\text{g}}{\text{m}^3} = \frac{1}{24,45} \text{ ppm}$ atau $1 \text{ ppm} = 24,45 \times 1 \mu\text{g}/\text{m}^3$

Sehingga,

$$\begin{aligned} 2 \frac{\mu\text{g}}{\text{m}^3} &= 2 \times \frac{1}{24,45} \text{ ppm} \\ &= 0,081799591 \text{ ppm} \\ &= 0,08 \text{ ppm} \end{aligned}$$

B. Perhitungan Hasil Uji Ketebalan Membran

No	Variasi Sampel	Ketebalan (mm)			Rata-Rata (mm)
		1	2	3	
1.	25 gr SA, tanpa PEG 400	1,7	1,6	1,5	1,60
2.	25 gr SA, 4 mL PEG 400	2,7	2,5	2,4	2,53
3.	25 gr SA, 8 mL PEG 400	2,3	2,5	2,4	2,40
4.	50 gr SA, 4 mL PEG 400	1,7	1,6	1,5	2,03
5.	50 gr SA, 8 mL PEG 400	2,5	2,4	2,4	2,43

1. 25 gr SA, tanpa PEG 400

Diketahui : $d_1 = 1,7 \text{ mm}$

$d_2 = 1,6 \text{ mm}$

$d_3 = 1,5 \text{ mm}$

Ditanya : Rata-Rata Ketebalan?

Penyelesaian : Ketebalan $= \frac{d_1 + d_2 + d_3}{3} = \frac{1,7 + 1,6 + 1,5}{3} = 1,60 \text{ mm}$

2. 25 gr SA, 4 mL PEG 400

Diketahui : $d_1 = 2,7 \text{ mm}$

$d_2 = 2,5 \text{ mm}$

$d_3 = 2,4 \text{ mm}$

Ditanya : Rata-Rata Ketebalan?

Penyelesaian : Ketebalan $= \frac{d_1 + d_2 + d_3}{3} = \frac{2,7 + 2,5 + 2,4}{3} = 2,53 \text{ mm}$

3. 25 gr SA, 8 mL PEG 400

Diketahui : $d_1 = 2,3 \text{ mm}$

$d_2 = 2,5 \text{ mm}$

$d_3 = 2,4 \text{ mm}$

Ditanya : Rata-Rata Ketebalan?

Penyelesaian : Ketebalan $= \frac{d_1 + d_2 + d_3}{3} = \frac{2,3 + 2,5 + 2,4}{3} = 2,40 \text{ mm}$

4. 50 gr SA, 4 mL PEG 400

Diketahui : $d_1 = 1,9 \text{ mm}$

$d_2 = 2,2 \text{ mm}$

$d_3 = 2,0 \text{ mm}$

Ditanya : Rata-Rata Ketebalan?

Penyelesaian : Ketebalan $= \frac{d_1 + d_2 + d_3}{3} = \frac{1,9 + 2,2 + 2,0}{3} = 2,03 \text{ mm}$

5. 50 gr SA, 8 mL PEG 400

Diketahui : $d_1 = 2,5 \text{ mm}$

$d_2 = 2,4 \text{ mm}$

$d_3 = 2,4 \text{ mm}$

Ditanya : Rata-Rata Ketebalan?

Penyelesaian : Ketebalan $= \frac{d_1 + d_2 + d_3}{3} = \frac{2,5 + 2,4 + 2,4}{3} = 2,43 \text{ mm}$

C. Perhitungan Hasil Uji Kuat Tarik Membran

1. 25 gr SA, tanpa PEG 400

Diketahui : Ketebalan = 1,60 mm

Lebar = 28 mm

Luas Permukaan (A) = 1,60 mm × 28 mm = 44,8 mm²

F = 170 N

Ditanya : Kuat Tarik (σ)?

Penyelesaian : Kuat Tarik (σ) = $\frac{F}{A} = \frac{170}{44,8} = 3,7946 \text{ Mpa}$

2. 25 gr SA, 4 mL PEG 400

Diketahui : Ketebalan = 2,53 mm

Lebar = 22 mm

Luas Permukaan (A) = 2,53 mm × 22 mm = 55,66 mm²

F = 42 N

Ditanya : Kuat Tarik (σ)?

Penyelesaian : Kuat Tarik (σ) = $\frac{F}{A} = \frac{42}{55,66} = 0,7546 \text{ Mpa}$

3. 25 gr SA, 8 mL PEG 400

Diketahui : Ketebalan = 2,4 mm

Lebar = 37 mm

Luas Permukaan (A) = 2,4 mm × 37 mm = 88,8 mm²

$$F = 46 \text{ N}$$

Ditanya : Kuat Tarik (σ)?

$$\text{Penyelesaian : Kuat Tarik } (\sigma) = \frac{F}{A} = \frac{46}{88,8} = 0,5180 \text{ Mpa}$$

4. 50 gr SA, 4 mL PEG 400

$$\text{Diketahui : Ketebalan} = 2,03 \text{ mm}$$

$$\text{Lebar} = 33 \text{ mm}$$

$$\text{Luas Permukaan (A)} = 2,03 \text{ mm} \times 33 \text{ mm} = 66,99 \text{ mm}^2$$

$$F = 19,5 \text{ N}$$

Ditanya : Kuat Tarik (σ)?

$$\text{Penyelesaian : Kuat Tarik } (\sigma) = \frac{F}{A} = \frac{19,5}{66,99} = 0,2911 \text{ Mpa}$$

5. 50 gr SA, 8 mL PEG 400

$$\text{Diketahui : Ketebalan} = 2,43 \text{ mm}$$

$$\text{Lebar} = 31 \text{ mm}$$

$$\text{Luas Permukaan (A)} = 2,43 \text{ mm} \times 31 \text{ mm} = 75,33 \text{ mm}^2$$

$$F = 6,6 \text{ N}$$

Ditanya : Kuat Tarik (σ)?

$$\text{Penyelesaian : Kuat Tarik } (\sigma) = \frac{F}{A} = \frac{6,6}{75,33} = 0,0876 \text{ Mpa}$$

D. Perhitungan Hasil Uji Elongasi Membran

1. 25 gr SA, tanpa PEG 400

$$\text{Diketahui : Elastisitas (E)} = 57,908 \text{ Mpa}$$

$$\text{Kuat Tarik } (\sigma) = 3,7946 \text{ Mpa}$$

Ditanya : Elongasi (ϵ)?

$$\text{Penyelesaian : Modulus Elastisitas (E)} = \frac{\sigma}{\epsilon}$$

$$\epsilon = \frac{\sigma}{E} \times 100\% = \frac{3,7946}{57,908} \times 100\% = 6,55\%$$

2. 25 gr SA, 4 mL PEG 400

Diketahui : Elastisitas (E) = 4,6691 Mpa

Kuat Tarik (σ) = 0,7546 Mpa

Ditanya : Elongasi (ϵ)?

Penyelesaian : *Modulus Elastisitas* (E) = $\frac{\sigma}{\epsilon}$

$$\epsilon = \frac{\sigma}{E} \times 100\% = \frac{0,7546}{4,6691} \times 100\% = 16,16\%$$

3. 25 gr SA, 8 mL PEG 400

Diketahui : Elastisitas (E) = 6,1004 Mpa

Kuat Tarik (σ) = 0,5180 Mpa

Ditanya : Elongasi (ϵ)?

Penyelesaian : *Modulus Elastisitas* (E) = $\frac{\sigma}{\epsilon}$

$$\epsilon = \frac{\sigma}{E} \times 100\% = \frac{0,5180}{6,1004} \times 100\% = 8,49\%$$

4. 50 gr SA, 4 mL PEG 400

Diketahui : Elastisitas (E) = 6,9303 Mpa

Kuat Tarik (σ) = 0,2911 Mpa

Ditanya : Elongasi (ϵ)?

Penyelesaian : *Modulus Elastisitas* (E) = $\frac{\sigma}{\epsilon}$

$$\epsilon = \frac{\sigma}{E} \times 100\% = \frac{0,2911}{6,9303} \times 100\% = 4,20\%$$

5. 50 gr SA, 8 mL PEG 400

Diketahui : Elastisitas (E) = 1,6631 Mpa

Kuat Tarik (σ) = 0,0876 Mpa

Ditanya : Elongasi (ϵ)?

Penyelesaian : *Modulus Elastisitas* (E) = $\frac{\sigma}{\epsilon}$

$$\epsilon = \frac{\sigma}{E} \times 100\% = \frac{0,0876}{1,6631} \times 100\% = 5,27\%$$

E. Perhitungan Hasil Uji Daya Serap Air

Wa ktu (me nit)	25 gr SA, tanpa PEG 400 (gr)	Daya Serap Air (%)	25 gr SA, 4 mL PEG 400 (gr)	Daya Serap Air (%)	25 gr SA, 8 mL PEG 400 (gr)	Daya Serap Air (%)	50 gr SA, 4 mL PEG 400 (gr)	Daya Serap Air (%)	50 gr SA, 8 mL PEG 400 (gr)	Daya Serap Air (%)
W _o	0,2278	-	0,2893	-	0,4578	-	0,3506	-	0,3138	-
5	0,2553	12,07	0,3463	19,70	0,4983	8,85	0,3909	11,49	0,3912	22,90
10	0,2756	20,98	0,3921	35,53	0,5160	12,71	0,4544	29,61	0,4319	35,69
15	0,2968	30,29	0,4294	48,42	0,5290	15,55	0,4942	40,96	0,4706	47,85
20	0,3138	37,75	0,4779	65,19	0,5413	18,24	0,5358	52,82	0,4730	48,60
25	0,3295	44,64	0,5110	76,63	0,5960	30,19	0,5771	64,60	0,5338	67,70
30	0,3453	51,58	0,5360	85,27	0,6139	34,10	0,6139	75,10	0,5788	81,84
35	0,3627	59,22	0,5598	93,50	0,6658	45,43	0,6548	86,77	0,6351	99,53
40	0,3782	66,02	0,5747	98,65	0,7386	61,34	0,6835	94,95	0,6571	106,44
45	0,3944	73,13	0,5811	100,8 6	0,7972	74,37	0,7129	103,34	0,6827	114,48
50	0,4073	78,80	0,6004	107,5 3	0,8415	83,81	0,7449	112,46	0,7006	120,11
55	0,4275	87,66	0,6028	108,3 6	0,9268	102,4 5	0,7677	118,97	0,7336	130,47
60	0,4390	92,71	0,6110	111,2 0	0,9902	116,3 0	7827	123,25	0,7534	136,69

1. 25 gr SA, tanpa PEG 400

a. 5 Menit

Diketahui : W_o = 0,2278 gr

W₁ = 0,2553 gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian} & : \text{DSA (\%)} = \frac{(W_1 - W_0)}{W_0} \times 100\% \\ & = \frac{(0,2553 - 0,2278)}{0,2278} \times 100\% = 12,07\% \end{aligned}$$

b. 10 Menit

Diketahui : $W_0 = 0,2278$ gr

$W_1 = 0,2756$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian} & : \text{DSA (\%)} = \frac{(W_1 - W_0)}{W_0} \times 100\% \\ & = \frac{(0,2756 - 0,2278)}{0,2278} \times 100\% = 20,98\% \end{aligned}$$

c. 15 Menit

Diketahui : $W_0 = 0,2278$ gr

$W_1 = 0,2968$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian} & : \text{DSA (\%)} = \frac{(W_1 - W_0)}{W_0} \times 100\% \\ & = \frac{(0,2968 - 0,2278)}{0,2278} \times 100\% = 30,29\% \end{aligned}$$

d. 20 Menit

Diketahui : $W_0 = 0,2278$ gr

$W_1 = 0,3138$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian} & : \text{DSA (\%)} = \frac{(W_1 - W_0)}{W_0} \times 100\% \\ & = \frac{(0,3138 - 0,2278)}{0,2278} \times 100\% = 37,75\% \end{aligned}$$

e. 25 Menit

Diketahui : $W_0 = 0,2278$ gr

$W_1 = 0,3295$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian} & : \text{DSA (\%)} = \frac{(W_1 - W_0)}{W_0} \times 100\% \\ & = \frac{(0,3295 - 0,2278)}{0,2278} \times 100\% = 44,64\% \end{aligned}$$

f. 30 Menit

Diketahui : $W_0 = 0,2278$ gr

$W_1 = 0,3453$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian} & : \text{DSA (\%)} = \frac{(W_1 - W_0)}{W_0} \times 100\% \\ & = \frac{(0,3453 - 0,2278)}{0,2278} \times 100\% = 51,58\% \end{aligned}$$

g. 35 Menit

Diketahui : $W_0 = 0,2278$ gr

$W_1 = 0,3627$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian} & : \text{DSA (\%)} = \frac{(W_1 - W_0)}{W_0} \times 100\% \\ & = \frac{(0,3627 - 0,2278)}{0,2278} \times 100\% = 59,22\% \end{aligned}$$

h. 40 Menit

Diketahui : $W_0 = 0,2278$ gr

$W_1 = 0,3782$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian} & : \text{DSA (\%)} = \frac{(W_1 - W_0)}{W_0} \times 100\% \\ & = \frac{(0,3782 - 0,2278)}{0,2278} \times 100\% = 66,02\% \end{aligned}$$

i. 45 Menit

Diketahui : $W_0 = 0,2278$ gr

$W_1 = 0,3944$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian} \quad : \text{DSA} (\%) &= \frac{(W_1 - W_0)}{W_0} \times 100\% \\ &= \frac{(0,3944 - 0,2278)}{0,2278} \times 100\% = 73,13\% \end{aligned}$$

j. 50 Menit

$$\text{Diketahui} \quad : W_0 = 0,2278 \text{ gr}$$

$$W_1 = 0,4073 \text{ gr}$$

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian} \quad : \text{DSA} (\%) &= \frac{(W_1 - W_0)}{W_0} \times 100\% \\ &= \frac{(0,4073 - 0,2278)}{0,2278} \times 100\% = 78,80\% \end{aligned}$$

k. 55 Menit

$$\text{Diketahui} \quad : W_0 = 0,2278 \text{ gr}$$

$$W_1 = 0,4275 \text{ gr}$$

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian} \quad : \text{DSA} (\%) &= \frac{(W_1 - W_0)}{W_0} \times 100\% \\ &= \frac{(0,4275 - 0,2278)}{0,2278} \times 100\% = 87,66\% \end{aligned}$$

l. 60 Menit

$$\text{Diketahui} \quad : W_0 = 0,2278 \text{ gr}$$

$$W_1 = 0,4390 \text{ gr}$$

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian} \quad : \text{DSA} (\%) &= \frac{(W_1 - W_0)}{W_0} \times 100\% \\ &= \frac{(0,4390 - 0,2278)}{0,2278} \times 100\% = 92,71\% \end{aligned}$$

2. 25 gr SA, 4 mL PEG 400

a. 5 Menit

Diketahui : $W_o = 0,2893$ gr

$W_1 = 0,3463$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned}\text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,3463 - 0,2893)}{0,2893} \times 100\% = 19,70\%\end{aligned}$$

b. 10 Menit

Diketahui : $W_o = 0,2893$ gr

$W_1 = 0,3921$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned}\text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,3921 - 0,2893)}{0,2893} \times 100\% = 35,53\%\end{aligned}$$

c. 15 Menit

Diketahui : $W_o = 0,2893$ gr

$W_1 = 0,4294$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned}\text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,4294 - 0,2893)}{0,2893} \times 100\% = 48,42\%\end{aligned}$$

d. 20 Menit

Diketahui : $W_o = 0,2893$ gr

$W_1 = 0,4779$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned}\text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,4779 - 0,2893)}{0,2893} \times 100\% = 65,19\%\end{aligned}$$

e. 25 Menit

Diketahui : $W_o = 0,2893$ gr

$W_1 = 0,5110$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,5110 - 0,2893)}{0,2893} \times 100\% = 76,63\% \end{aligned}$$

f. 30 Menit

Diketahui : $W_o = 0,2893$ gr

$W_1 = 0,5360$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,5360 - 0,2893)}{0,2893} \times 100\% = 85,27\% \end{aligned}$$

g. 35 Menit

Diketahui : $W_o = 0,2893$ gr

$W_1 = 0,5598$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,5598 - 0,2893)}{0,2893} \times 100\% = 93,50\% \end{aligned}$$

h. 40 Menit

Diketahui : $W_o = 0,2893$ gr

$W_1 = 0,5747$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,5747 - 0,2893)}{0,2893} \times 100\% = 98,65\% \end{aligned}$$

i. 45 Menit

Diketahui : $W_o = 0,2893$ gr

$W_1 = 0,5811$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,5811 - 0,2893)}{0,2893} \times 100\% = 1\% \end{aligned}$$

j. 50 Menit

Diketahui : $W_o = 0,2893$ gr

$W_1 = 0,6004$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,6004 - 0,2893)}{0,2893} \times 100\% = 107,53\% \end{aligned}$$

k. 55 Menit

Diketahui : $W_o = 0,2893$ gr

$W_1 = 0,6028$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,6028 - 0,2893)}{0,2893} \times 100\% = 108,36\% \end{aligned}$$

l. 60 Menit

Diketahui : $W_o = 0,2893$ gr

$W_1 = 0,6110$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,6110 - 0,2893)}{0,2893} \times 100\% = 111,20\% \end{aligned}$$

3. 25 gr SA, 8 mL PEG 400

a. 5 Menit

Diketahui : $W_o = 0,4578$ gr

$W_1 = 0,4983$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,4983 - 0,4578)}{0,4578} \times 100\% = 8,85\% \end{aligned}$$

b. 10 Menit

Diketahui : $W_o = 0,4578$ gr

$W_1 = 0,5160$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,5160 - 0,4578)}{0,4578} \times 100\% = 12,71\% \end{aligned}$$

c. 15 Menit

Diketahui : $W_o = 0,4578$ gr

$W_1 = 0,5290$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,5290 - 0,4578)}{0,4578} \times 100\% = 15,55\% \end{aligned}$$

d. 20 Menit

Diketahui : $W_o = 0,4578$ gr

$W_1 = 0,5413$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,5413 - 0,4578)}{0,4578} \times 100\% = 18,24\% \end{aligned}$$

e. 25 Menit

Diketahui : $W_o = 0,4578$ gr

$W_1 = 0,5960$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,5960 - 0,4578)}{0,4578} \times 100\% = 30,19\% \end{aligned}$$

f. 30 Menit

Diketahui : $W_o = 0,4578$ gr

$W_1 = 0,6139$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,6139 - 0,4578)}{0,4578} \times 100\% = 34,10\% \end{aligned}$$

g. 35 Menit

Diketahui : $W_o = 0,4578$ gr

$W_1 = 0,6658$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,6658 - 0,4578)}{0,4578} \times 100\% = 45,43\% \end{aligned}$$

h. 40 Menit

Diketahui : $W_o = 0,4578$ gr

$W_1 = 0,7386$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,7386 - 0,4578)}{0,4578} \times 100\% = 61,34\% \end{aligned}$$

i. 45 Menit

Diketahui : $W_o = 0,4578$ gr

$W_1 = 0,7972$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,7972 - 0,4578)}{0,4578} \times 100\% = 74,37\% \end{aligned}$$

j. 50 Menit

Diketahui : $W_o = 0,4578$ gr

$W_1 = 0,8415$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,8415 - 0,4578)}{0,4578} \times 100\% = 83,81\% \end{aligned}$$

k. 55 Menit

Diketahui : $W_o = 0,4578$ gr

$W_1 = 0,9268$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,9268 - 0,4578)}{0,4578} \times 100\% = 102,45\% \end{aligned}$$

l. 60 Menit

Diketahui : $W_o = 0,4578$ gr

$W_1 = 0,9902$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,9902 - 0,4578)}{0,4578} \times 100\% = 116,30\% \end{aligned}$$

4. 50 gr SA, 4 mL PEG 400

a. 5 Menit

Diketahui : $W_o = 0,3506$ gr

$W_1 = 0,3909$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,3909 - 0,3506)}{0,3506} \times 100\% = 11,49\% \end{aligned}$$

b. 10 Menit

Diketahui : $W_o = 0,3506$ gr

$W_1 = 0,4544$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,4544 - 0,3506)}{0,3506} \times 100\% = 29,61\% \end{aligned}$$

c. 15 Menit

Diketahui : $W_o = 0,3506$ gr

$W_1 = 0,4942$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,4942 - 0,3506)}{0,3506} \times 100\% = 40,96\% \end{aligned}$$

d. 20 Menit

Diketahui : $W_o = 0,3506$ gr

$W_1 = 0,5358$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,5358 - 0,3506)}{0,3506} \times 100\% = 52,82\% \end{aligned}$$

e. 25 Menit

Diketahui : $W_o = 0,3506$ gr

$W_1 = 0,5771$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,5771 - 0,3506)}{0,3506} \times 100\% = 64,60\% \end{aligned}$$

f. 30 Menit

Diketahui : $W_o = 0,3506$ gr

$W_1 = 0,6139$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,6139 - 0,3506)}{0,3506} \times 100\% = 75,10\% \end{aligned}$$

g. 35 Menit

Diketahui : $W_o = 0,3506$ gr

$W_1 = 0,6548$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,6548 - 0,3506)}{0,3506} \times 100\% = 86,77\% \end{aligned}$$

h. 40 Menit

Diketahui : $W_o = 0,3506$ gr

$W_1 = 0,6835$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,6835 - 0,3506)}{0,3506} \times 100\% = 94,95\% \end{aligned}$$

i. 45 Menit

Diketahui : $W_o = 0,3506$ gr

$W_1 = 0,7129$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,7129 - 0,3506)}{0,3506} \times 100\% = 103,34\% \end{aligned}$$

j. 50 Menit

Diketahui : $W_o = 0,3506$ gr

$W_1 = 0,7449$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,7449 - 0,3506)}{0,3506} \times 100\% = 112,46\% \end{aligned}$$

k. 55 Menit

Diketahui : $W_o = 0,3506$ gr

$W_1 = 0,7677$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,7677 - 0,3506)}{0,3506} \times 100\% = 118,97\% \end{aligned}$$

l. 60 Menit

Diketahui : $W_o = 0,3506$ gr

$W_1 = 0,7827$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,7827 - 0,3506)}{0,3506} \times 100\% = 123,25\% \end{aligned}$$

5. 50 gr SA, 8 mL PEG 400

a. 5 Menit

Diketahui : $W_o = 0,3183$ gr

$W_1 = 0,3912$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,3912 - 0,3183)}{0,3183} \times 100\% = 22,90\% \end{aligned}$$

b. 10 Menit

Diketahui : $W_o = 0,3183$ gr

$W_1 = 0,4319$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,4319 - 0,3183)}{0,3183} \times 100\% = 35,69\% \end{aligned}$$

c. 15 Menit

Diketahui : $W_o = 0,3183$ gr

$W_1 = 0,4706$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,4706 - 0,3183)}{0,3183} \times 100\% = 47,85\% \end{aligned}$$

d. 20 Menit

Diketahui : $W_o = 0,3183$ gr

$W_1 = 0,4730$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,4730 - 0,3183)}{0,3183} \times 100\% = 48,60\% \end{aligned}$$

e. 25 Menit

Diketahui : $W_o = 0,3183$ gr

$W_1 = 0,5338$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,5338 - 0,3183)}{0,3183} \times 100\% = 67,70\% \end{aligned}$$

f. 30 Menit

Diketahui : $W_o = 0,3183$ gr

$W_1 = 0,5788$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,5788 - 0,3183)}{0,3183} \times 100\% = 81,84\% \end{aligned}$$

g. 35 Menit

Diketahui : $W_o = 0,3183$ gr

$W_1 = 0,6351$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,6351 - 0,3183)}{0,3183} \times 100\% = 99,53\% \end{aligned}$$

h. 40 Menit

Diketahui : $W_o = 0,3183$ gr

$W_1 = 0,6571$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,6571 - 0,3183)}{0,3183} \times 100\% = 106,44\% \end{aligned}$$

i. 45 Menit

Diketahui : $W_o = 0,3183$ gr

$W_1 = 0,6827$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,6827 - 0,3183)}{0,3183} \times 100\% = 114,48\% \end{aligned}$$

j. 50 Menit

Diketahui : $W_o = 0,3183$ gr

$W_1 = 0,7006$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,7006 - 0,3183)}{0,3183} \times 100\% = 120,11\% \end{aligned}$$

k. 55 Menit

Diketahui : $W_o = 0,3183$ gr

$W_1 = 0,7336$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,7336 - 0,3183)}{0,3183} \times 100\% = 130,47\% \end{aligned}$$

l. 60 Menit

Diketahui : $W_o = 0,3183$ gr

$W_1 = 0,7534$ gr

Ditanya : Daya Serap Air (%)?

$$\begin{aligned} \text{Penyelesaian : DSA (\%)} &= \frac{(W_1 - W_o)}{W_o} \times 100\% \\ &= \frac{(0,7534 - 0,3183)}{0,3183} \times 100\% = 136,69\% \end{aligned}$$

F. Perhitungan Hasil Uji Biodegradabilitas

Hari ke-	25 gr SA, tanpa PEG 400 (gr)	Daya Serap Air (%)	25 gr SA, 4 mL PEG 400 (gr)	Daya Serap Air (%)	25 gr SA, 8 mL PEG 400 (gr)	Daya Serap Air (%)	50 gr SA, 4 mL PEG 400 (gr)	Daya Serap Air (%)	50 gr SA, 8 mL PEG 400 (gr)	Daya Serap Air (%)
W _o	0,2452	-	0,2560	-	0,4407	-	0,2720	-	0,3037	-
1	0,2269	8,07	0,2323	10,20	0,3937	11,94	0,2514	8,19	0,2802	8,39
2	0,2112	16,14	0,2165	18,24	0,3642	21,00	0,2325	16,99	0,2598	16,89
3	0,2025	21,09	0,2020	26,73	0,3317	32,86	0,2192	24,09	0,2482	22,36
4	0,1899	29,12	0,1774	44,23	0,2999	46,95	0,1932	40,64	0,2193	38,49
5	0,1749	40,19	0,1565	63,58	0,2661	65,61	0,1783	52,55	0,1974	53,85
6	0,1491	64,45	0,1404	82,34	0,2399	83,70	0,1554	75,03	0,1753	73,25
7	0,1397	75,52	0,1306	96,02	0,2216	98,87	0,1448	87,85	0,1609	88,75

1. 25 gr SA, tanpa PEG 400

a. Hari ke-1

Diketahui : W_o = 0,2425 gr

W₁ = 0,2269 gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian : B(\%)} &= \frac{(W_o - W_1)}{W_1} \times 100\% \\ &= \frac{(0,2425 - 0,2269)}{0,2269} \times 100\% = 8,07\% \end{aligned}$$

b. Hari ke-2

Diketahui : W_o = 0,2425 gr

W₁ = 0,2112 gr

Ditanya : Biodegradabilitas (%)?

$$\text{Penyelesaian : B(\%)} = \frac{(W_o - W_1)}{W_1} \times 100\%$$

$$= \frac{(0,2425-0,2112)}{0,2112} \times 100\% = 16,14\%$$

c. Hari ke-3

Diketahui : $W_0 = 0,2425$ gr

$W_1 = 0,2025$ gr

Ditanya : Biodegradabilitas (%)?

Penyelesaian : $B(\%) = \frac{(W_0 - W_1)}{W_1} \times 100\%$
 $= \frac{(0,2425 - 0,2025)}{0,2025} \times 100\% = 21,09\%$

d. Hari ke-4

Diketahui : $W_0 = 0,2425$ gr

$W_1 = 0,1899$ gr

Ditanya : Biodegradabilitas (%)?

Penyelesaian : $B(\%) = \frac{(W_0 - W_1)}{W_1} \times 100\%$
 $= \frac{(0,2425 - 0,1899)}{0,1899} \times 100\% = 29,12\%$

e. Hari ke-5

Diketahui : $W_0 = 0,2425$ gr

$W_1 = 0,1749$ gr

Ditanya : Biodegradabilitas (%)?

Penyelesaian : $B(\%) = \frac{(W_0 - W_1)}{W_1} \times 100\%$
 $= \frac{(0,2425 - 0,1749)}{0,1749} \times 100\% = 40,19\%$

f. Hari ke-6

Diketahui : $W_0 = 0,2425$ gr

$W_1 = 0,1491$ gr

Ditanya : Biodegradabilitas (%)?

Penyelesaian : $B(\%) = \frac{(W_0 - W_1)}{W_1} \times 100\%$

$$= \frac{(0,2425-0,1491)}{0,1491} \times 100\% = 64,45\%$$

g. Hari ke-7

Diketahui : $W_0 = 0,2425$ gr

$W_1 = 0,1397$ gr

Ditanya : Biodegradabilitas (%)?

Penyelesaian : $B(\%) = \frac{(W_0 - W_1)}{W_1} \times 100\%$

$$= \frac{(0,2425 - 0,1397)}{0,1397} \times 100\% = 75,52\%$$

2. 25 gr SA, 4 mL PEG 400

a. Hari ke-1

Diketahui : $W_0 = 0,2560$ gr

$W_1 = 0,2323$ gr

Ditanya : Biodegradabilitas (%)?

Penyelesaian : $B(\%) = \frac{(W_0 - W_1)}{W_1} \times 100\%$

$$= \frac{(0,2560 - 0,2323)}{0,2323} \times 100\% = 10,20\%$$

b. Hari ke-2

Diketahui : $W_0 = 0,2560$ gr

$W_1 = 0,2165$ gr

Ditanya : Biodegradabilitas (%)?

Penyelesaian : $B(\%) = \frac{(W_0 - W_1)}{W_1} \times 100\%$

$$= \frac{(0,2560 - 0,2165)}{0,2165} \times 100\% = 18,24\%$$

c. Hari ke-3

Diketahui : $W_0 = 0,2560$ gr

$W_1 = 0,2020$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian} & : B(\%) = \frac{(W_0 - W_1)}{W_1} \times 100\% \\ & = \frac{(0,2560 - 0,2020)}{0,2020} \times 100\% = 26,73\% \end{aligned}$$

d. Hari ke-4

Diketahui : $W_0 = 0,2560$ gr

$W_1 = 0,1774$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian} & : B(\%) = \frac{(W_0 - W_1)}{W_1} \times 100\% \\ & = \frac{(0,2560 - 0,1774)}{0,1774} \times 100\% = 44,23\% \end{aligned}$$

e. Hari ke-5

Diketahui : $W_0 = 0,2560$ gr

$W_1 = 0,1565$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian} & : B(\%) = \frac{(W_0 - W_1)}{W_1} \times 100\% \\ & = \frac{(0,2560 - 0,1565)}{0,1565} \times 100\% = 63,58\% \end{aligned}$$

f. Hari ke-6

Diketahui : $W_0 = 0,2560$ gr

$W_1 = 0,1404$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian} & : B(\%) = \frac{(W_0 - W_1)}{W_1} \times 100\% \\ & = \frac{(0,2560 - 0,1404)}{0,1404} \times 100\% = 82,34\% \end{aligned}$$

g. Hari ke-7

Diketahui : $W_0 = 0,2560$ gr

$W_1 = 0,1306$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian} \quad : B(\%) &= \frac{(W_0 - W_1)}{W_1} \times 100\% \\ &= \frac{(0,2560 - 0,1306)}{0,1306} \times 100\% = 96,02\% \end{aligned}$$

3. 25 gr SA, 8 mL PEG 400

a. Hari ke-1

$$\begin{aligned} \text{Diketahui} \quad : W_0 &= 0,4404 \text{ gr} \\ W_1 &= 0,3937 \text{ gr} \end{aligned}$$

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian} \quad : B(\%) &= \frac{(W_0 - W_1)}{W_1} \times 100\% \\ &= \frac{(0,4404 - 0,3937)}{0,3937} \times 100\% = 11,94\% \end{aligned}$$

b. Hari ke-2

$$\begin{aligned} \text{Diketahui} \quad : W_0 &= 0,4404 \text{ gr} \\ W_1 &= 0,3642 \text{ gr} \end{aligned}$$

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian} \quad : B(\%) &= \frac{(W_0 - W_1)}{W_1} \times 100\% \\ &= \frac{(0,4404 - 0,3642)}{0,3642} \times 100\% = 21,00\% \end{aligned}$$

c. Hari ke-3

$$\begin{aligned} \text{Diketahui} \quad : W_0 &= 0,4404 \text{ gr} \\ W_1 &= 0,3317 \text{ gr} \end{aligned}$$

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian} \quad : B(\%) &= \frac{(W_0 - W_1)}{W_1} \times 100\% \\ &= \frac{(0,4404 - 0,3317)}{0,3317} \times 100\% = 32,86\% \end{aligned}$$

d. Hari ke-4

$$\begin{aligned} \text{Diketahui} \quad : W_0 &= 0,4404 \text{ gr} \\ W_1 &= 0,2999 \text{ gr} \end{aligned}$$

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned}\text{Penyelesaian : B(\%)} &= \frac{(W_0 - W_1)}{W_1} \times 100\% \\ &= \frac{(0,4404 - 0,2999)}{0,2999} \times 100\% = 46,95\%\end{aligned}$$

e. Hari ke-5

Diketahui : $W_0 = 0,4404$ gr

$W_1 = 0,2661$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned}\text{Penyelesaian : B(\%)} &= \frac{(W_0 - W_1)}{W_1} \times 100\% \\ &= \frac{(0,4404 - 0,2661)}{0,2661} \times 100\% = 65,61\%\end{aligned}$$

f. Hari ke-6

Diketahui : $W_0 = 0,4404$ gr

$W_1 = 0,2399$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned}\text{Penyelesaian : B(\%)} &= \frac{(W_0 - W_1)}{W_1} \times 100\% \\ &= \frac{(0,4404 - 0,2399)}{0,2399} \times 100\% = 83,70\%\end{aligned}$$

g. Hari ke-7

Diketahui : $W_0 = 0,4404$ gr

$W_1 = 0,2216$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned}\text{Penyelesaian : B(\%)} &= \frac{(W_0 - W_1)}{W_1} \times 100\% \\ &= \frac{(0,4404 - 0,2216)}{0,2216} \times 100\% = 98,87\%\end{aligned}$$

4. 50 gr SA, 4 mL PEG 400

a. Hari ke-1

Diketahui : $W_o = 0,2720$ gr

$W_1 = 0,2514$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned}\text{Penyelesaian : B(\%)} &= \frac{(W_o - W_1)}{W_1} \times 100\% \\ &= \frac{(0,2720 - 0,2514)}{0,2514} \times 100\% = 8,19\%\end{aligned}$$

b. Hari ke-2

Diketahui : $W_o = 0,2720$ gr

$W_1 = 0,2325$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned}\text{Penyelesaian : B(\%)} &= \frac{(W_o - W_1)}{W_1} \times 100\% \\ &= \frac{(0,2720 - 0,2325)}{0,2325} \times 100\% = 16,99\%\end{aligned}$$

c. Hari ke-3

Diketahui : $W_o = 0,2720$ gr

$W_1 = 0,2192$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned}\text{Penyelesaian : B(\%)} &= \frac{(W_o - W_1)}{W_1} \times 100\% \\ &= \frac{(0,2720 - 0,2192)}{0,2192} \times 100\% = 24,09\%\end{aligned}$$

d. Hari ke-4

Diketahui : $W_o = 0,2720$ gr

$W_1 = 0,1932$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned}\text{Penyelesaian : B(\%)} &= \frac{(W_o - W_1)}{W_1} \times 100\% \\ &= \frac{(0,2720 - 0,1932)}{0,1932} \times 100\% = 40,64\%\end{aligned}$$

e. Hari ke-5

Diketahui : $W_o = 0,2720$ gr

$W_1 = 0,1783$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned}\text{Penyelesaian : B(\%)} &= \frac{(W_o - W_1)}{W_1} \times 100\% \\ &= \frac{(0,2720 - 0,1783)}{0,1783} \times 100\% = 52,55\%\end{aligned}$$

f. Hari ke-6

Diketahui : $W_o = 0,2720$ gr

$W_1 = 0,1554$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned}\text{Penyelesaian : B(\%)} &= \frac{(W_o - W_1)}{W_1} \times 100\% \\ &= \frac{(0,2720 - 0,1554)}{0,1554} \times 100\% = 75,03\%\end{aligned}$$

g. Hari ke-7

Diketahui : $W_o = 0,2720$ gr

$W_1 = 0,1448$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned}\text{Penyelesaian : B(\%)} &= \frac{(W_o - W_1)}{W_1} \times 100\% \\ &= \frac{(0,2720 - 0,1448)}{0,1448} \times 100\% = 87,85\%\end{aligned}$$

5. 50 gr SA, 8 mL PEG 400

a. Hari ke-1

Diketahui : $W_o = 0,3037$ gr

$W_1 = 0,2802$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned}\text{Penyelesaian : B(\%)} &= \frac{(W_o - W_1)}{W_1} \times 100\% \\ &= \frac{(0,3037 - 0,2802)}{0,2802} \times 100\% = 8,39\%\end{aligned}$$

b. Hari ke-2

Diketahui : $W_0 = 0,3037$ gr

$W_1 = 0,2598$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian : B(\%)} &= \frac{(W_0 - W_1)}{W_1} \times 100\% \\ &= \frac{(0,3037 - 0,2598)}{0,2598} \times 100\% = 16,89\% \end{aligned}$$

c. Hari ke-3

Diketahui : $W_0 = 0,3037$ gr

$W_1 = 0,2482$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian : B(\%)} &= \frac{(W_0 - W_1)}{W_1} \times 100\% \\ &= \frac{(0,3037 - 0,2482)}{0,2482} \times 100\% = 22,36\% \end{aligned}$$

d. Hari ke-4

Diketahui : $W_0 = 0,3037$ gr

$W_1 = 0,2193$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian : B(\%)} &= \frac{(W_0 - W_1)}{W_1} \times 100\% \\ &= \frac{(0,3037 - 0,2193)}{0,2193} \times 100\% = 38,49\% \end{aligned}$$

e. Hari ke-5

Diketahui : $W_0 = 0,3037$ gr

$W_1 = 0,1974$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian : B(\%)} &= \frac{(W_0 - W_1)}{W_1} \times 100\% \\ &= \frac{(0,3037 - 0,1974)}{0,1974} \times 100\% = 53,85\% \end{aligned}$$

f. Hari ke-6

Diketahui : $W_0 = 0,3037$ gr

$W_1 = 0,1753$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian : } B(\%) &= \frac{(W_0 - W_1)}{W_1} \times 100\% \\ &= \frac{(0,3037 - 0,1753)}{0,1753} \times 100\% = 73,25\% \end{aligned}$$

g. Hari ke-7

Diketahui : $W_0 = 0,3037$ gr

$W_1 = 0,1609$ gr

Ditanya : Biodegradabilitas (%)?

$$\begin{aligned} \text{Penyelesaian : } B(\%) &= \frac{(W_0 - W_1)}{W_1} \times 100\% \\ &= \frac{(0,3037 - 0,1609)}{0,1609} \times 100\% = 88,75\% \end{aligned}$$

G. Perhitungan Hasil Uji Efektivitas

Variasi Sampel	Input		15 Menit		30 Menit		45 Menit		60 Menit	
	1	2	1	2	1	2	1	2	1	2
25 gr SA, tanpa PEG	1109	1221	282	286	313	318	338	340	363	374
25 gr SA, 4 mL PEG 400	1273	1176	143	162	172	173	174	174	183	187
25 gr SA, 8 mL PEG 400	1115	1208	137	152	184	187	200	230	232	252
50 gr SA, 4 mL PEG 400	1084	1293	219	223	236	242	256	257	292	298
50 gr SA, 8 mL PEG 400	1109	1357	240	343	266	365	301	385	330	390
50 gr SA, 4 mL PEG 600	1234	1219	282	339	318	321	289	373	329	355
50 gr SA, 8 mL PEG 600	1155	1319	336	347	331	375	280	448	331	416

1. 25 gr SA, tanpa PEG 400

a. 15 Menit

Diketahui : CO *input* = $\frac{(1109+1221)}{2} = 1165$ ppm

CO *output* = $\frac{(282+286)}{2} = 284$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
= $\frac{(1165 - 284)}{1165} \times 100\% = 75,62\%$

b. 30 Menit

Diketahui : CO *input* = $\frac{(1109+1221)}{2} = 1165$ ppm

CO *output* = $\frac{(313+318)}{2} = 315,5$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
= $\frac{(1165 - 315,5)}{1165} \times 100\% = 72,92\%$

c. 45 Menit

Diketahui : CO *input* = $\frac{(1109+1221)}{2} = 1165$ ppm

CO *output* = $\frac{(338+340)}{2} = 339$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
= $\frac{(1165 - 339)}{1165} \times 100\% = 70,90\%$

d. 60 Menit

Diketahui : CO *input* = $\frac{(1109+1221)}{2} = 1165$ ppm

CO *output* = $\frac{(363+374)}{2} = 368,5$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
 $= \frac{(1165 - 368,5)}{1165} \times 100\% = 68,37\%$

2. 25 gr SA, 4 mL PEG 400

a. 15 Menit

Diketahui : CO *input* = $\frac{(1273 + 1176)}{2} = 1224,5$ ppm
CO *output* = $\frac{(143 + 162)}{2} = 152,5$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
 $= \frac{(1224,5 - 152,5)}{1224,5} \times 100\% = 87,55\%$

b. 30 Menit

Diketahui : CO *input* = $\frac{(1273 + 1176)}{2} = 1224,5$ ppm
CO *output* = $\frac{(172 + 173)}{2} = 172,5$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
 $= \frac{(1224,5 - 172,5)}{1224,5} \times 100\% = 85,91\%$

c. 45 Menit

Diketahui : CO *input* = $\frac{(1273 + 1176)}{2} = 1224,5$ ppm
CO *output* = $\frac{(174 + 174)}{2} = 174$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
 $= \frac{(1224,5 - 174)}{1224,5} \times 100\% = 85,79\%$

d. 60 Menit

Diketahui : CO *input* = $\frac{(1273+1176)}{2} = 1224,5$ ppm

CO *output* = $\frac{(183+187)}{2} = 185$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
= $\frac{(1224,5 - 185)}{1224,5} \times 100\% = 84,89\%$

3. 25 gr SA, 8 mL PEG 400

a. 15 Menit

Diketahui : CO *input* = $\frac{(1115+1208)}{2} = 1161,5$ ppm

CO *output* = $\frac{(137+152)}{2} = 144,5$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
= $\frac{(1161,5 - 144,5)}{1161,5} \times 100\% = 87,33\%$

b. 30 Menit

Diketahui : CO *input* = $\frac{(1115+1208)}{2} = 1161,5$ ppm

CO *output* = $\frac{(184+187)}{2} = 185,5$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
= $\frac{(1161,5 - 185,5)}{1161,5} \times 100\% = 84,03\%$

c. 45 Menit

Diketahui : CO *input* = $\frac{(1115+1208)}{2} = 1161,5$ ppm

CO *output* = $\frac{(200+230)}{2} = 215$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
 $= \frac{(1161,5 - 215)}{1161,5} \times 100\% = 81,49\%$

d. 60 Menit

Diketahui : CO *input* = $\frac{(1115 + 1208)}{2} = 1161,5$ ppm

CO *output* = $\frac{(232 + 252)}{2} = 242$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
 $= \frac{(1161,5 - 242)}{1161,5} \times 100\% = 79,16\%$

4. 50 gr SA, 4 mL PEG 400

a. 15 Menit

Diketahui : CO *input* = $\frac{(1084 + 1293)}{2} = 1188,5$ ppm

CO *output* = $\frac{(219 + 223)}{2} = 221$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
 $= \frac{(1188,5 - 221)}{1188,5} \times 100\% = 81,40\%$

b. 30 Menit

Diketahui : CO *input* = $\frac{(1084 + 1293)}{2} = 1188,5$ ppm

CO *output* = $\frac{(236 + 242)}{2} = 239$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
 $= \frac{(1188,5 - 239)}{1188,5} \times 100\% = 79,89\%$

c. 45 Menit

Diketahui : CO *input* = $\frac{(1084+1293)}{2} = 1188,5$ ppm

CO *output* = $\frac{(256+257)}{2} = 256,5$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1-C_2}{C_1} \times 100\%$
= $\frac{(1188,5-256,5)}{1188,5} \times 100\% = 78,42\%$

d. 60 Menit

Diketahui : CO *input* = $\frac{(1084+1293)}{2} = 1188,5$ ppm

CO *output* = $\frac{(292+298)}{2} = 295$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1-C_2}{C_1} \times 100\%$
= $\frac{(1188,5-295)}{1188,5} \times 100\% = 79,16\%$

5. 50 gr SA, 8 mL PEG 400

a. 15 Menit

Diketahui : CO *input* = $\frac{(1109+1357)}{2} = 1233$ ppm

CO *output* = $\frac{(240+343)}{2} = 291,5$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1-C_2}{C_1} \times 100\%$
= $\frac{(1233-291,5)}{1233} \times 100\% = 76,36\%$

b. 30 Menit

Diketahui : CO *input* = $\frac{(1109+1357)}{2} = 1233$ ppm

CO *output* = $\frac{(266+365)}{2} = 315,5$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
 $= \frac{(1233 - 315,5)}{1233} \times 100\% = 74,41\%$

c. 45 Menit

Diketahui : CO *input* = $\frac{(1109 + 1357)}{2} = 1233$ ppm

CO *output* = $\frac{(301 + 385)}{2} = 343$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
 $= \frac{(1233 - 343)}{1233} \times 100\% = 72,18\%$

d. 60 Menit

Diketahui : CO *input* = $\frac{(1109 + 1357)}{2} = 1233$ ppm

CO *output* = $\frac{(330 + 390)}{2} = 360$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
 $= \frac{(1233 - 360)}{1233} \times 100\% = 70,80\%$

6. 50 gr SA, 4 mL PEG 600

a. 15 Menit

Diketahui : CO *input* = $\frac{(1234 + 1219)}{2} = 1226,5$ ppm

CO *output* = $\frac{(282 + 339)}{2} = 310,5$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1 - C_2}{C_1} \times 100\%$
 $= \frac{(1226,5 - 310,5)}{1226,5} \times 100\% = 74,68\%$

b. 30 Menit

Diketahui : CO *input* = $\frac{(1234+1219)}{2} = 1226,5$ ppm

CO *output* = $\frac{(318+321)}{2} = 319,5$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1-C_2}{C_1} \times 100\%$
= $\frac{(1226,5-319,5)}{1226,5} \times 100\% = 73,95\%$

c. 45 Menit

Diketahui : CO *input* = $\frac{(1234+1219)}{2} = 1226,5$ ppm

CO *output* = $\frac{(289+373)}{2} = 331$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1-C_2}{C_1} \times 100\%$
= $\frac{(1226,5-331)}{1226,5} \times 100\% = 73,01\%$

d. 60 Menit

Diketahui : CO *input* = $\frac{(1234+1219)}{2} = 1226,5$ ppm

CO *output* = $\frac{(329+355)}{2} = 342$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C_1-C_2}{C_1} \times 100\%$
= $\frac{(1226,5-342)}{1226,5} \times 100\% = 72,12\%$

7. 50 gr SA, 8 mL PEG 600

a. 15 Menit

Diketahui : CO *input* = $\frac{(1155+1319)}{2} = 1237$ ppm

CO *output* = $\frac{(336+347)}{2} = 341,5$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C1-C2}{C1} \times 100\%$
 $= \frac{(1237-341,5)}{1237} \times 100\% = 72,39\%$

b. 30 Menit

Diketahui : CO *input* = $\frac{(1155+1319)}{2} = 1237$ ppm

CO *output* = $\frac{(331+375)}{2} = 353$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C1-C2}{C1} \times 100\%$
 $= \frac{(1237-353)}{1237} \times 100\% = 71,46\%$

c. 45 Menit

Diketahui : CO *input* = $\frac{(1155+1319)}{2} = 1237$ ppm

CO *output* = $\frac{(280+448)}{2} = 364$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C1-C2}{C1} \times 100\%$
 $= \frac{(1237-364)}{1237} \times 100\% = 70,57\%$

d. 60 Menit

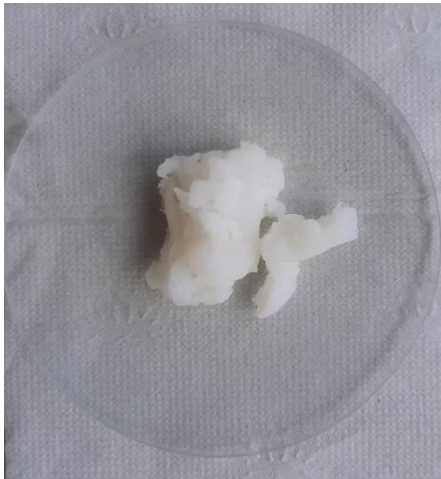
Diketahui : CO *input* = $\frac{(1155+1319)}{2} = 1237$ ppm

CO *output* = $\frac{(331+416)}{2} = 373,5$ ppm

Ditanya : Efektivitas (%)?

Penyelesaian : Efektivitas (%) = $\frac{C1-C2}{C1} \times 100\%$
 $= \frac{(1237-373,5)}{1237} \times 100\% = 69,81\%$

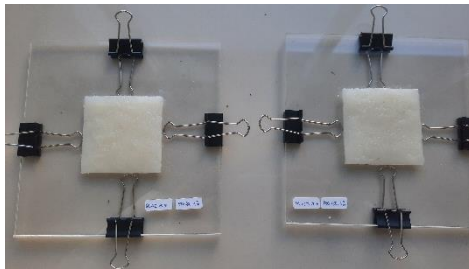
LAMPIRAN 2
DOKUMENTASI PENELITIAN



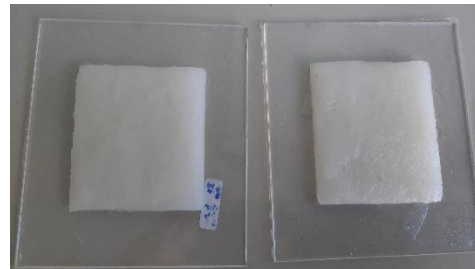
Selulosa Asetat Kulit Pisang Kepok



Pembuatan Membran Selulosa Asetat



Pencetakan Membran



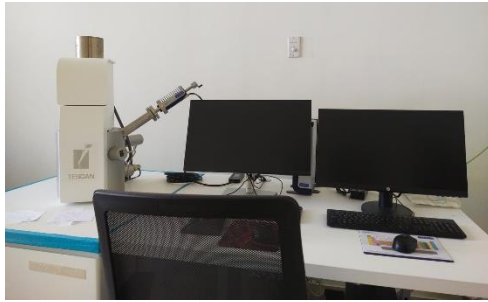
Membran Selulosa Asetat



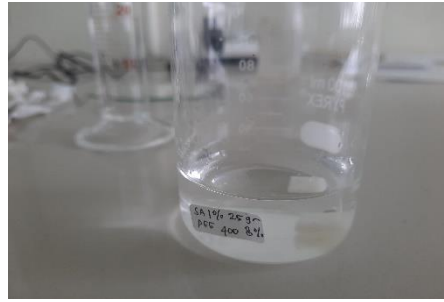
Pengujian Ketebalan Membran
Menggunakan Jangka Sorong Digital



Analisis Gugus Fungsi Membran
Menggunakan FTIR



Analisis Morfologi Membran
Menggunakan SEM



Pengujian Daya Serap Air pada
Membran



Pengujian Biodegradabilitas Membran



Pengujian Biodegradabilitas Membran



Pengujian Kuat Tarik dan Elongasi
Membran



Instrumentasi *Portable Gas Analyzer*



Rangkaian Tempat Penampung Asap Rokok dan Tempat Membran



Pengujian Efektivitas Membran dalam Mereduksi Gas CO pada Asap Rokok



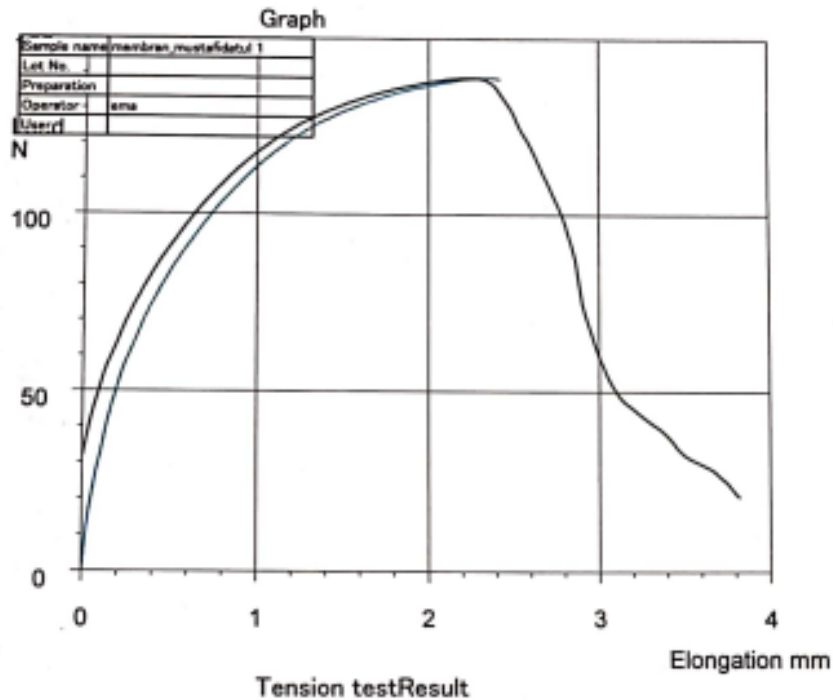
Membran Selulosa Asetat Sebelum Pengaplikasian pada Asap Rokok



Membran Selulosa Asetat Setelah Pengaplikasian pada Asap Rokok

LAMPIRAN 3
HASIL PENGUJIAN

A. HASIL PENGUJIAN KUAT TARIK DAN ELONGASI

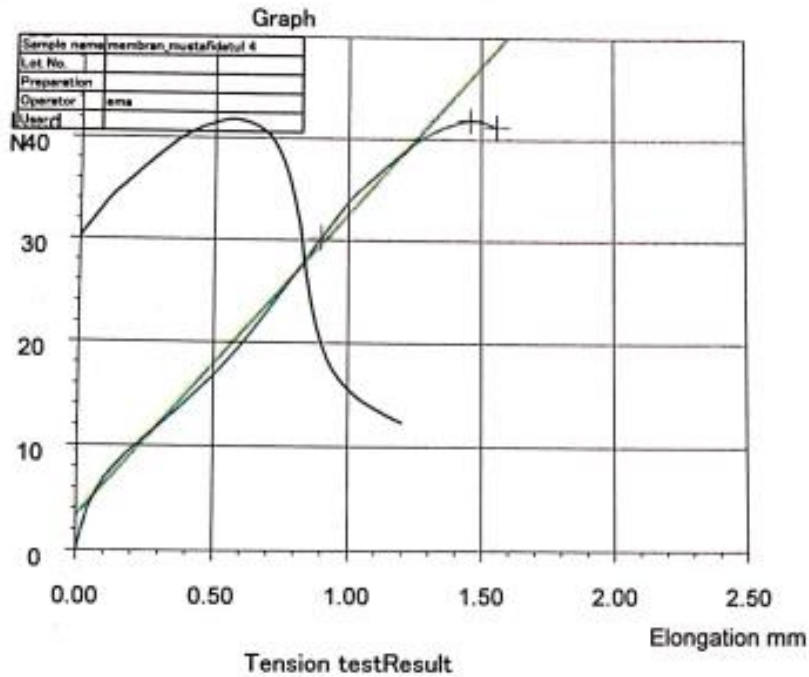


Sample No.	Color
1	Black
Average SS	Red

Machine name	RTI series			Test type	Tension		
Strain input 1	Not used			Test speed	5.0 mm/min		
Chart speed	OFF			Machine rigidity	0 mm/kgf		
Point data(Load)	0	0	0	Point data(Elong)	0	0	0
	N				mm		
Elastic modulus anal.	Interval	1	100	Initial sample length	Distance	9.6 mm	
Load	Pitch	5 N		Origin of elongation	Init. load	0.3 %RO	
Elong adjust	No			Break point measurem	0.5 N		
Save SS curve	Yes						

Test date	2023/07/12		Temperature	25 C	
Humidity	60 %RH		Sample name	membran_mustafidatul 1	
Lot No.			Preparation		
Operator	ema		User		
Comment 1			Comment 2		

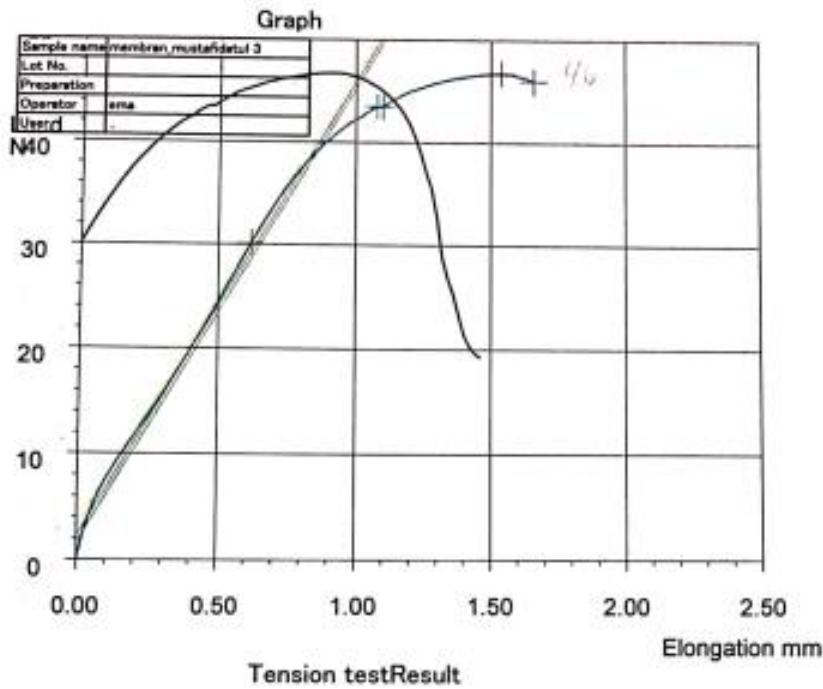
TestID=18	Width	Thickness	Elastic modu	Young	Initial elon
Test No	mm	mm	MPa	MPa	mm
1	28.000	1.6000	57.908	57.908	0.1000



Machine name	RTI series	Test type	Tension		
Strain input 1	Not used	Test speed	3.0 mm/min		
Chart speed	OFF	Machine rigidity	0 mm/kgf		
Point data(Load)	0 0 0	Point data(Elong)	0 0 0		
	N	mm	0 0 0		
Elastic modulus anal.	Interval	1	100		
Load	Pitch	5 N	Initial sample length	Distance	8.9 mm
Elong adjust	No	Origin of elongation	Init. load	0.3 %RO	
Save SS curve	Yes	Break point measurement	0.5 N		

Test date	2023/07/12	Temperature	25 C
Humidity	60 %RH	Sample name	membran_mustafidatul 4 *
Lot No.		Preparation	
Operator	ema	User	
Comment 1		Comment 2	

TestID=22	Width	Thickness	Elastic modu	Young's Modu	Initial elon
Test No	mm	mm	MPa	MPa	mm
1	22.000	2.5300	4.6691	4.6691	0.9000

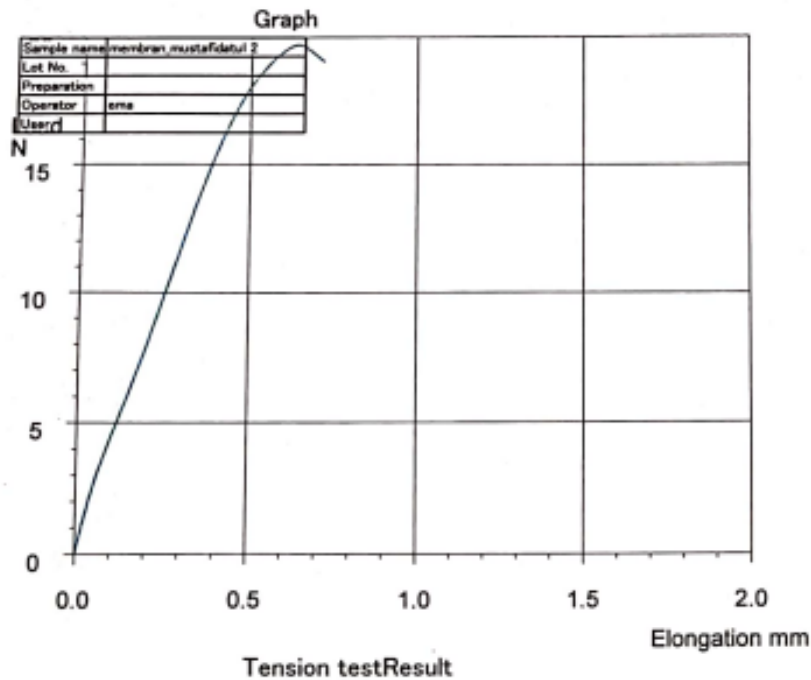


Sample No.	Color
1	
Average SS	

Machine name	RTI series	Test type	Tension
Strain input 1	Not used	Test speed	3.0 mm/min
Chart speed	OFF	Machine rigidity	0 mm/kgf
Point data(Load)	0 0 0	Point data(Elong)	0 0 0
	N 0 0 0	mm	0 0 0
Elastic modulus anal.	Interval 1 100	Initial sample length	Distance 12.4 mm
Load	Pitch 5 N	Origin of elongation	Init. load 0.3 %RO
Elong adjust	No	Break point measure	0.5 N
Save SS curve	Yes		

Test date	2023/07/12	Temperature	25 C
Humidity	60 %RH	Sample name	membran_mustafidatul 3
Lot No.		Preparation	
Operator	ema	User	
Comment 1		Comment 2	

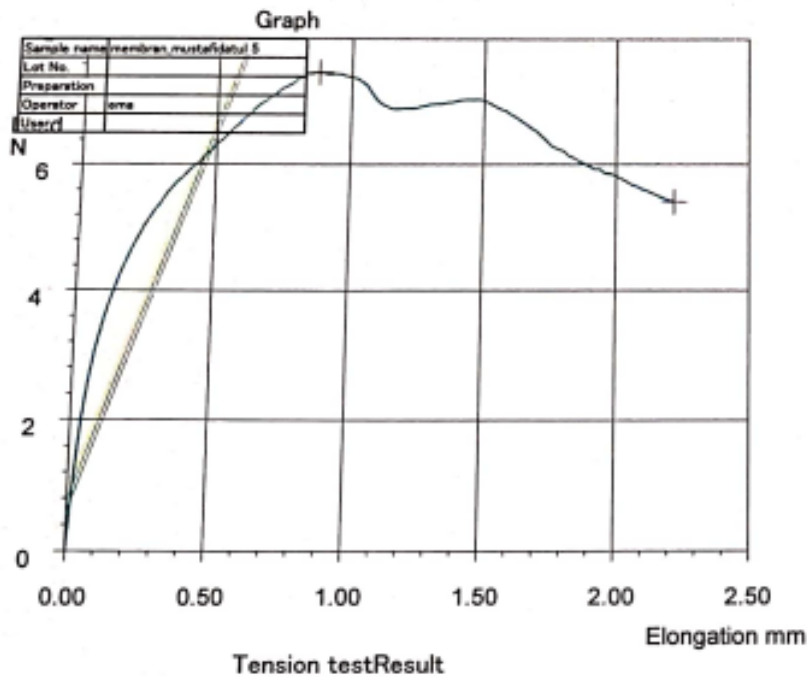
TestID=20	Width	Thickness	Elastic modu	Young's Modu	Initial elon
Test No	mm	mm	MPa	MPa	mm
1	37.000	2.4000	6.1004	6.1004	0.6200



Machine name	RTI series			Test type	Tension		
Strain input 1	Not used			Test speed	5.0 mm/min		
Chart speed	OFF			Machine rigidity	0 mm/kgf		
Point data(Load)	0	0	0	Point data(Elong)	0	0	0
	N	0	0		mm	0	0
Elastic modulus anal.	Interval	1	100	Initial sample length	Distance	12.6 mm	
Load	Pitch	5 N		Origin of elongation	Init. load	0.3 %RO	
Elong adjust	No			Break point measurem	0.5 N		
Save SS curve	Yes						

Test date	2023/07/12		Temperature	25 C	
Humidity	60 %RH		Sample name	membran_mustafidatul 2	
Lot No.			Preparation		
Operator	ema		User		
Comment 1			Comment 2		

TestID=19	Width	Thickness	Elastic modu	Young	Initial elon
Test No	mm	mm	MPa	MPa	mm
1	33.000	2.0300	6.9303	6.9303	*****

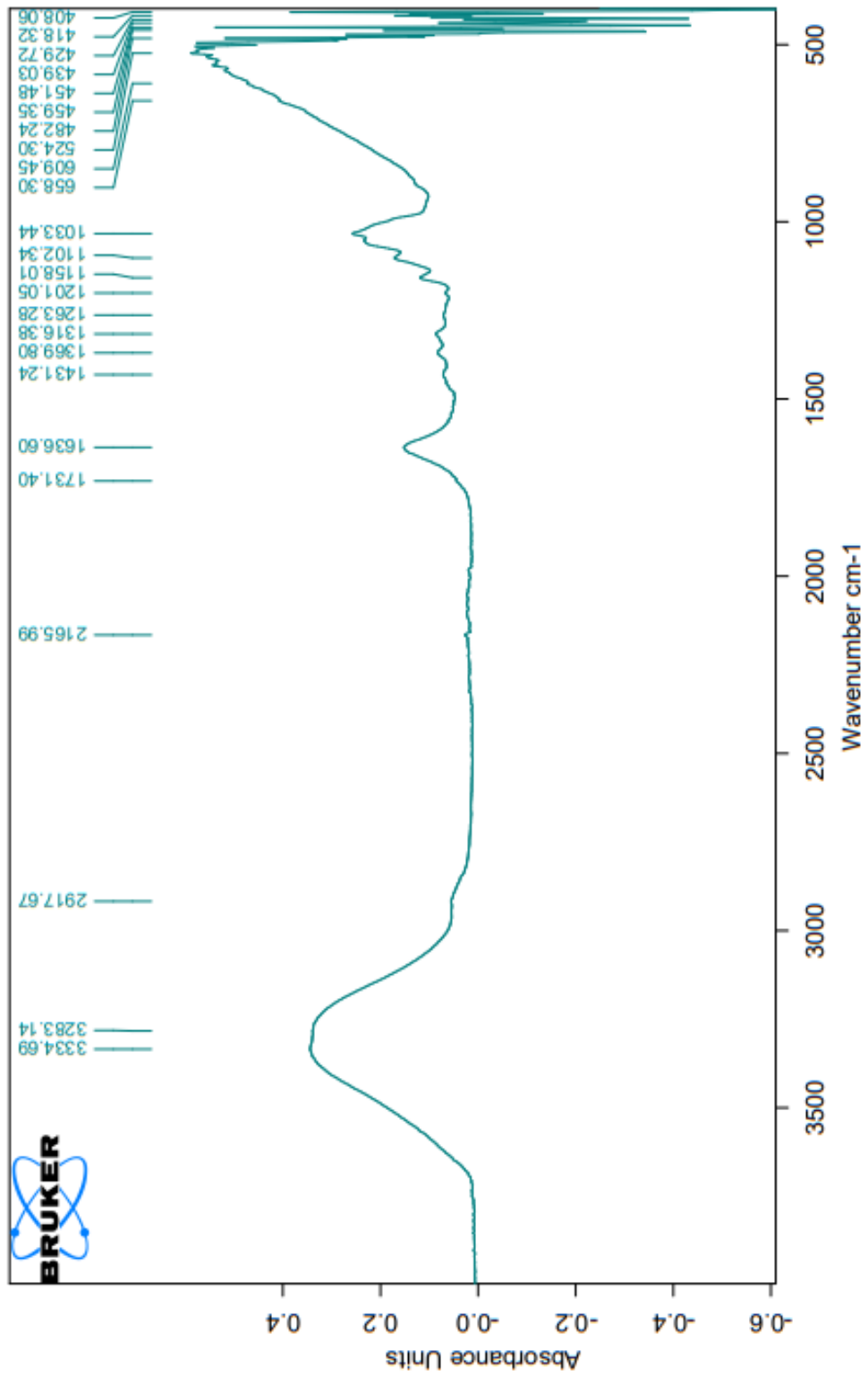


Machine name	RTI series	Test type	Tension
Strain input 1	Not used	Test speed	3.0 mm/min
Chart speed	OFF	Machine rigidity	0 mm/kgf
Point data(Load)	0 0 0	Point data(Elong)	0 0 0
N	0 0 0	mm	0 0 0
Elastic modulus anal.	Interval 1 100	Initial sample length	Distance 10.7 mm
Load	Pitch 5 N	Origin of elongation	Init. load 0.3 %RO
Elong adjust	No	Break point measure	0.5 N
Save SS curve	Yes		

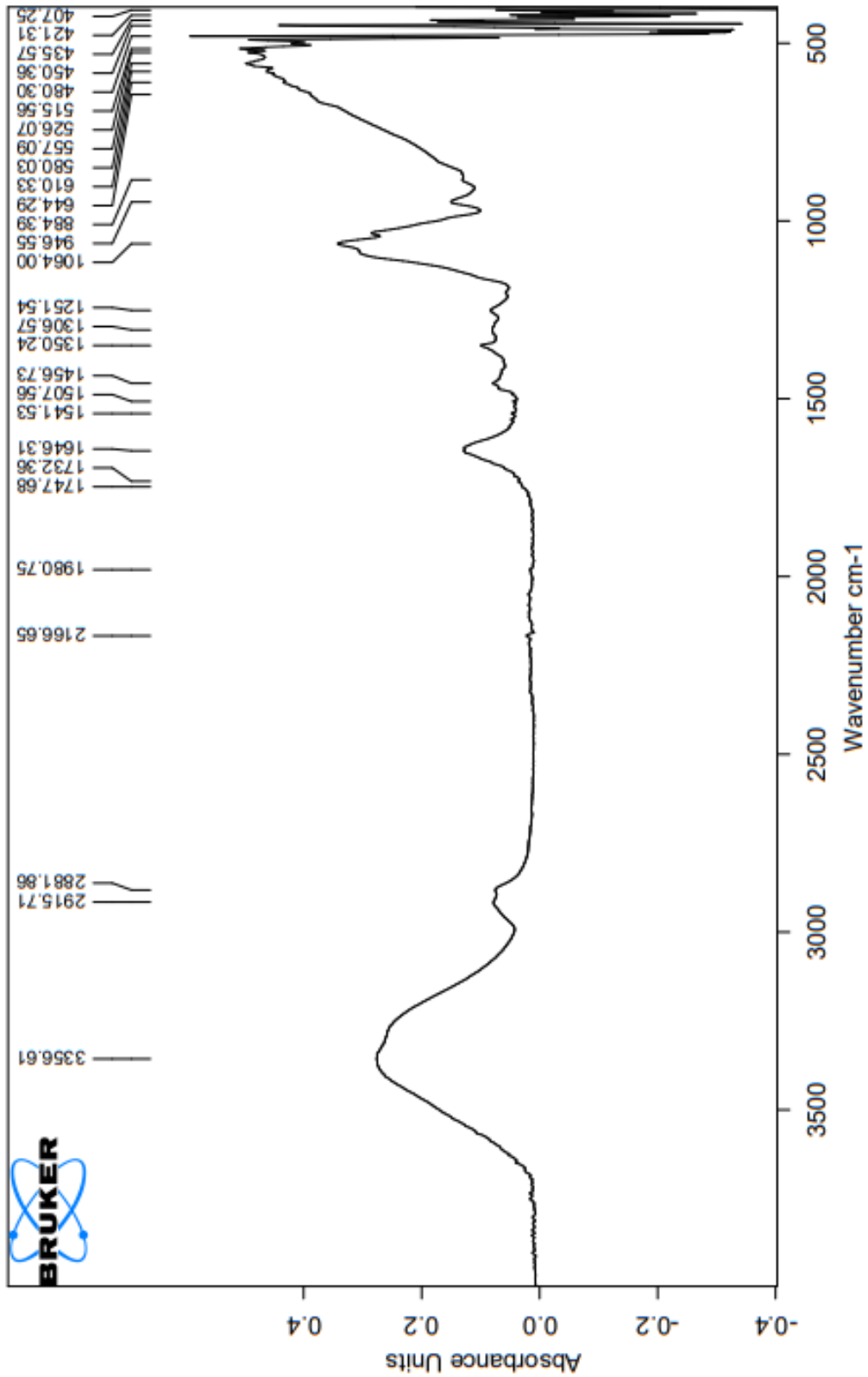
Test date	2023/07/12	Temperature	25 C
Humidity	60 %RH	Sample name	membran mustafidatul 5
Lot No.		Preparation	
Operator	ema	User	
Comment 1		Comment 2	

TestID=23	Width	Thickness	Elastic modu	Young's Modu	Initial elon
Test No	mm	mm	MPa	MPa	mm
1	31.000	2.4300	1.6631	1.6631	*****

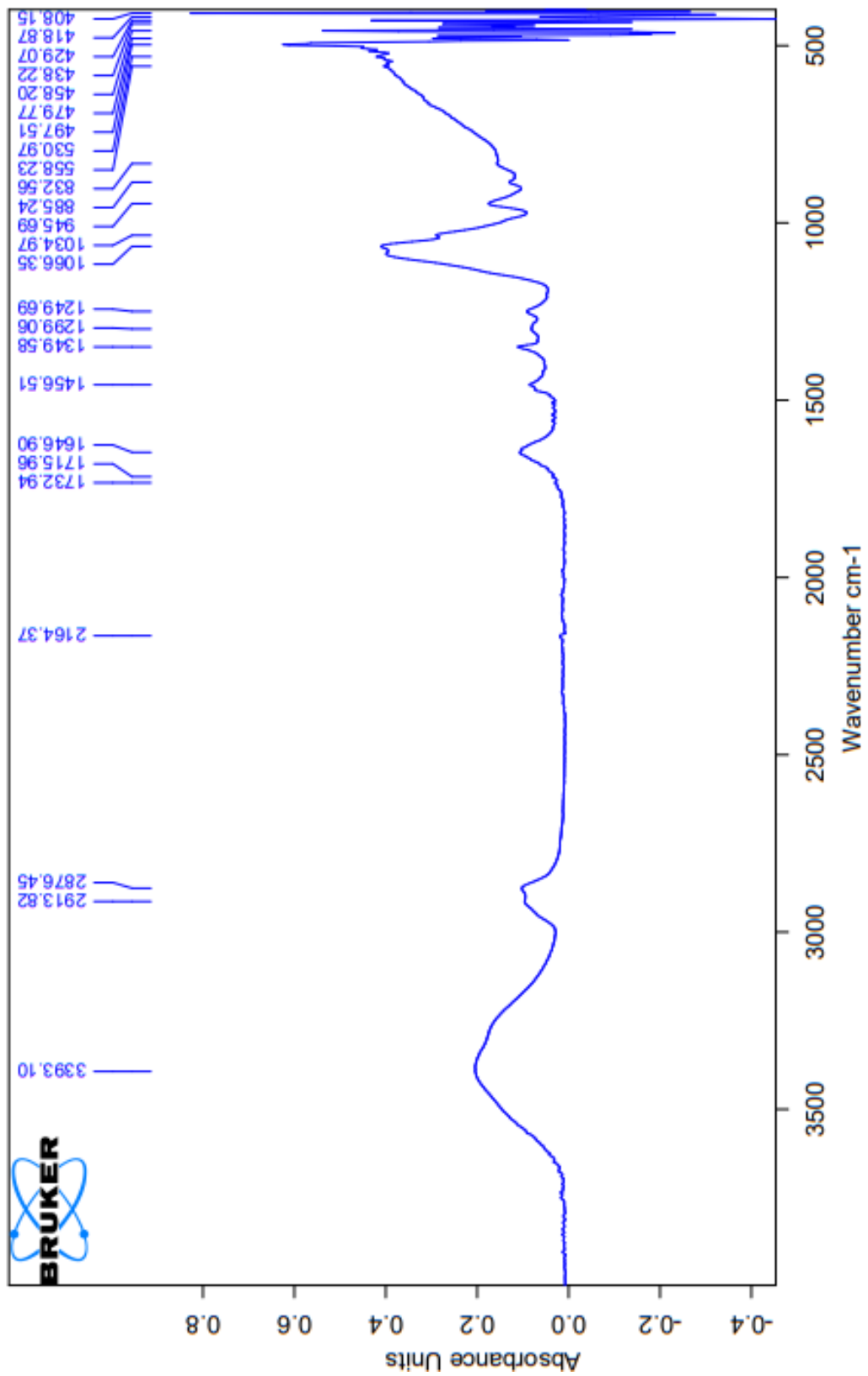
B. HASIL PENGUJIAN FTIR

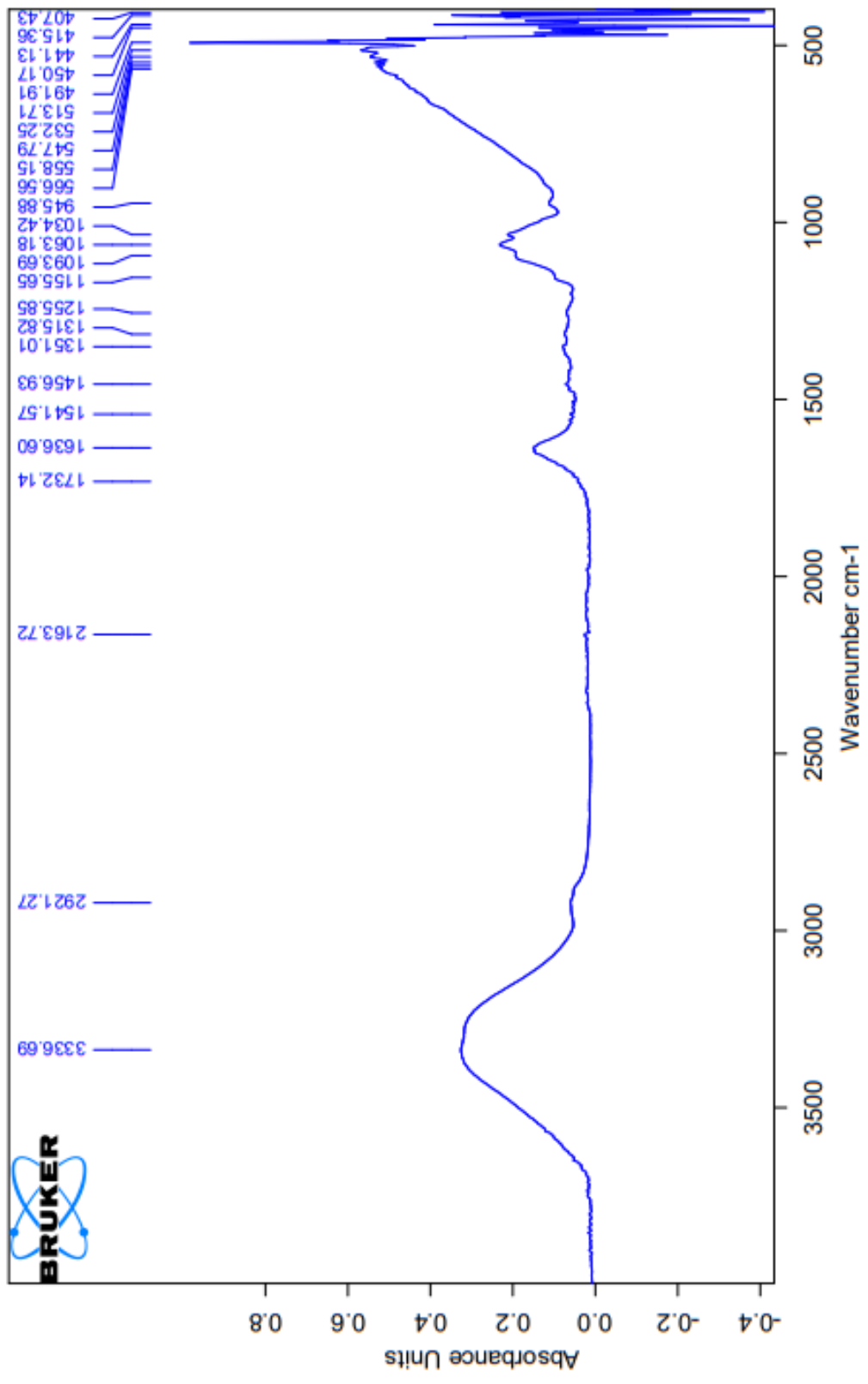


C:\Users\HP\Documents\Bruker\OPUS_8.7.31\DATA\MEASISA 1% 25 tanpa PEG 1.0 SA 1% 25 tanpa PEG 1 Instrument type and / or a 01/07/2023

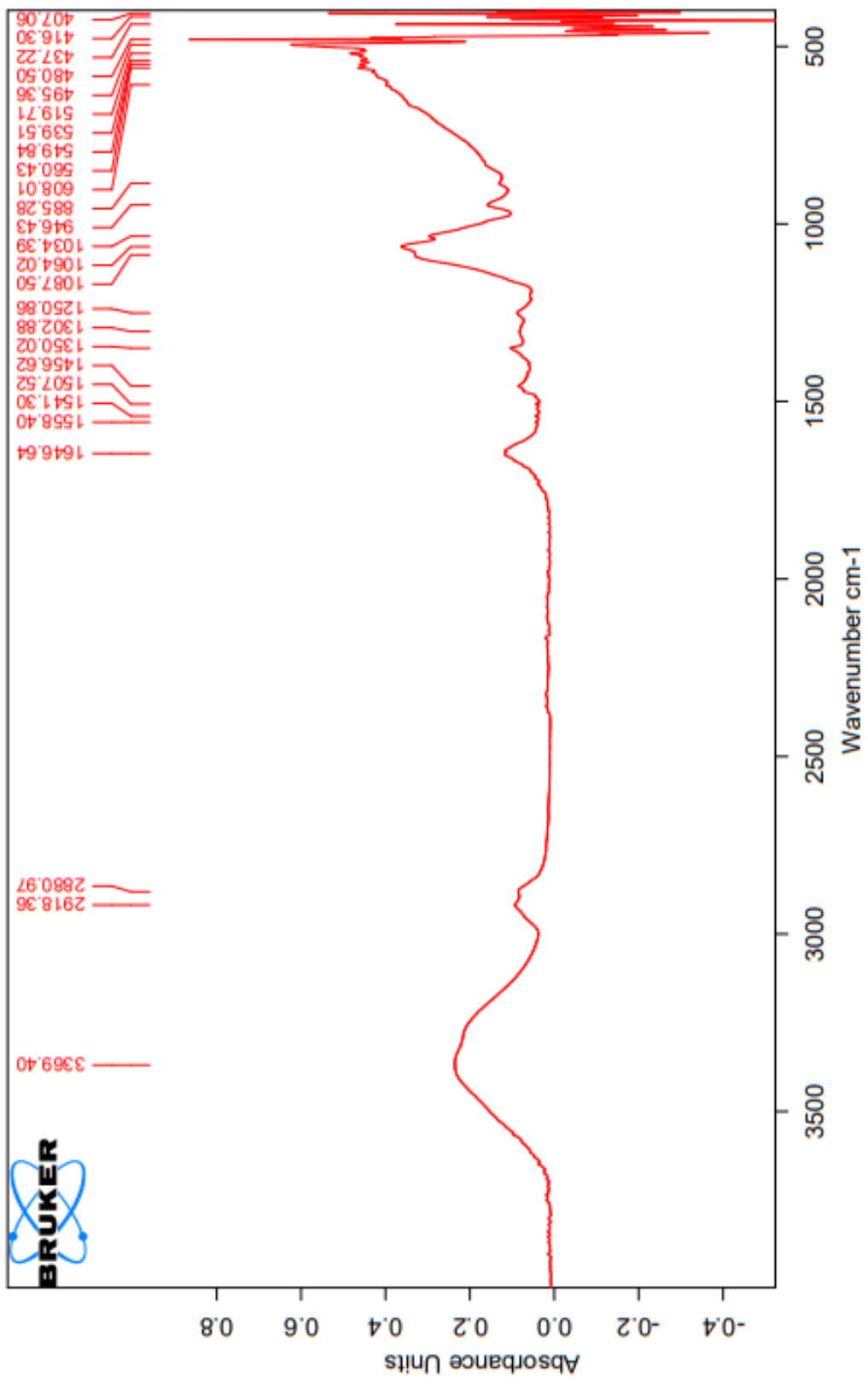


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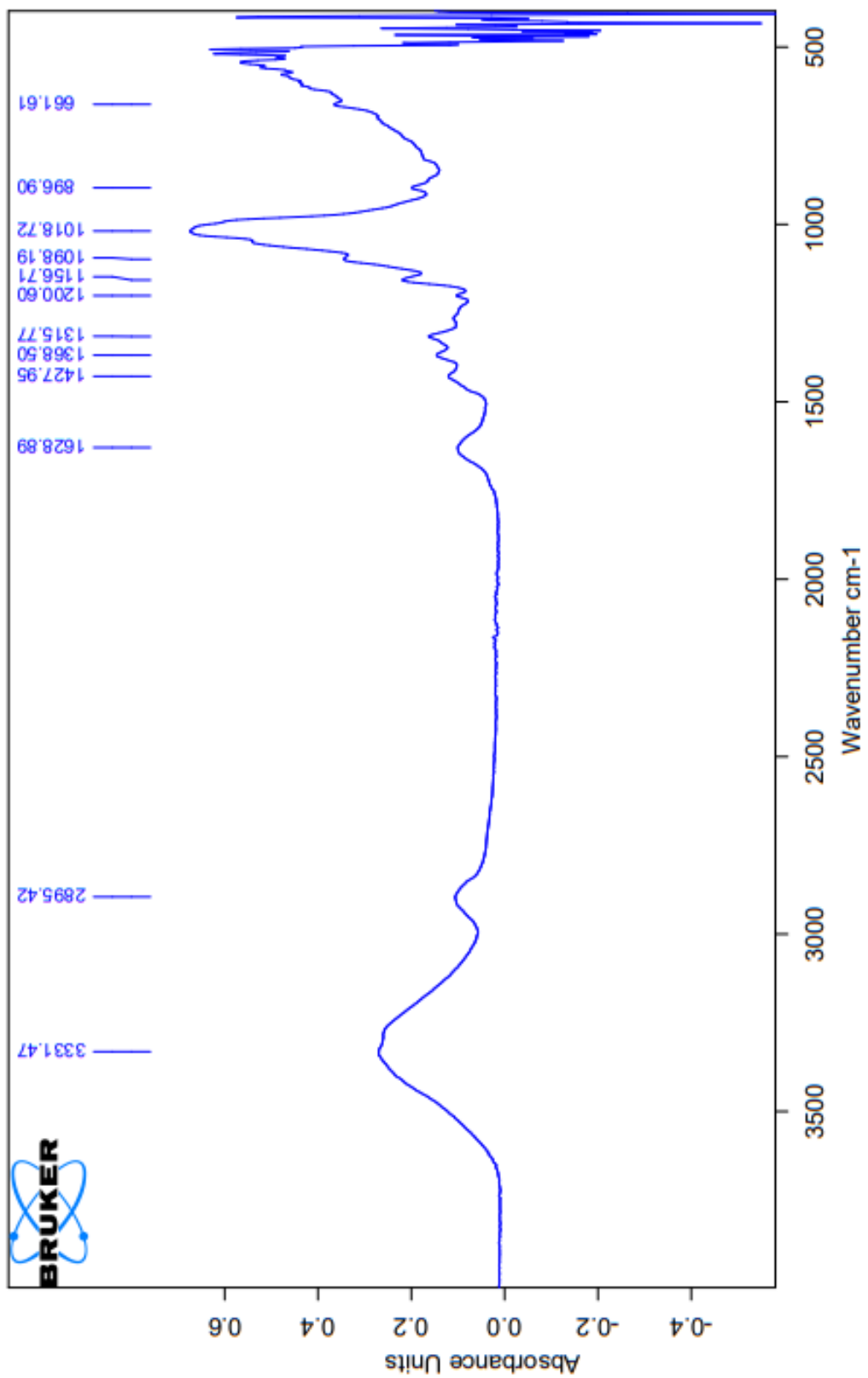




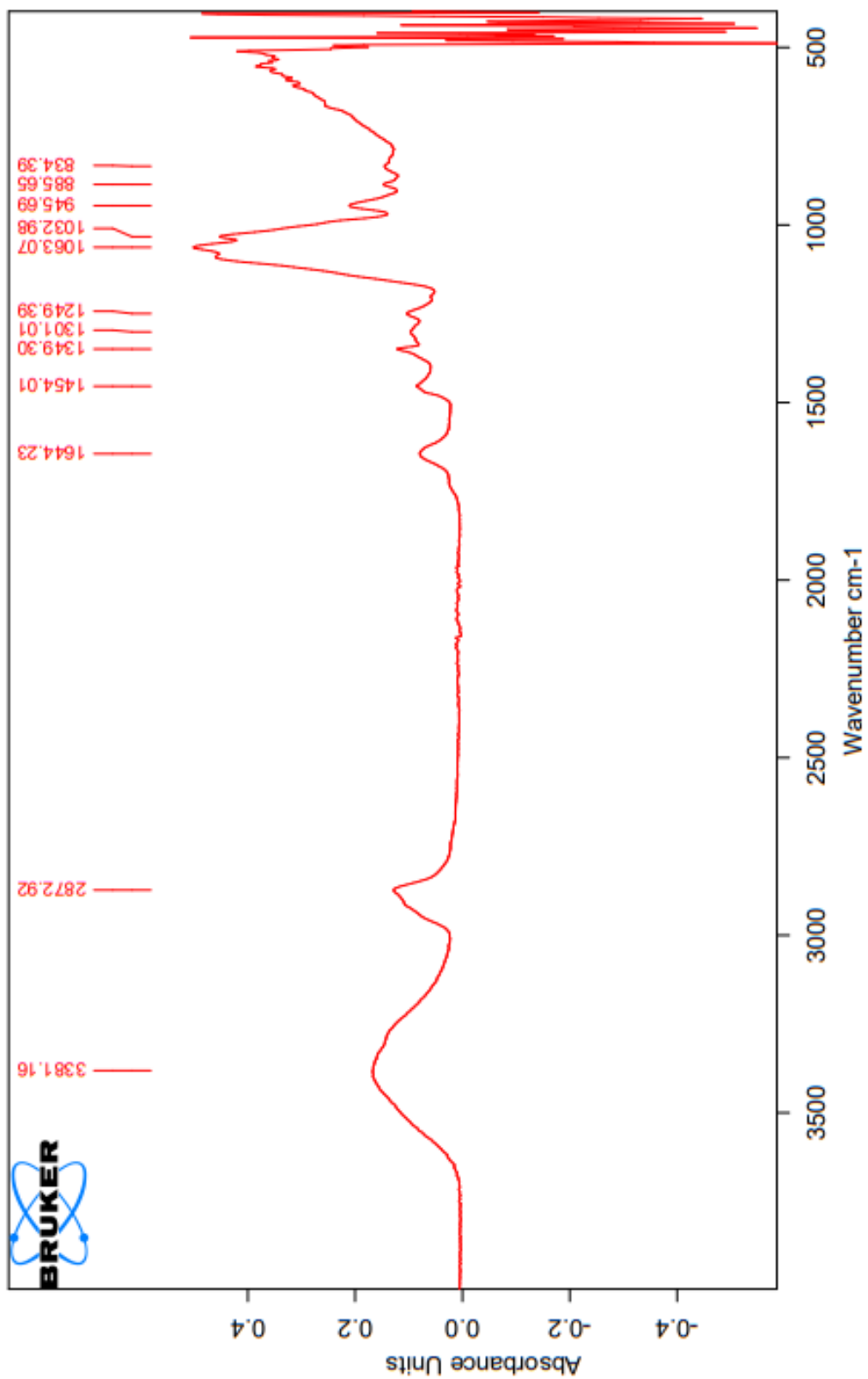
C:\Users\HP\Documents\Bruker\OPUS_8.7.31\DATA\MEAS\SA 1% 50 PEG 400 4%.0 SA 1% 50 PEG 400 4% Instrument type and / or a 01/07/2023



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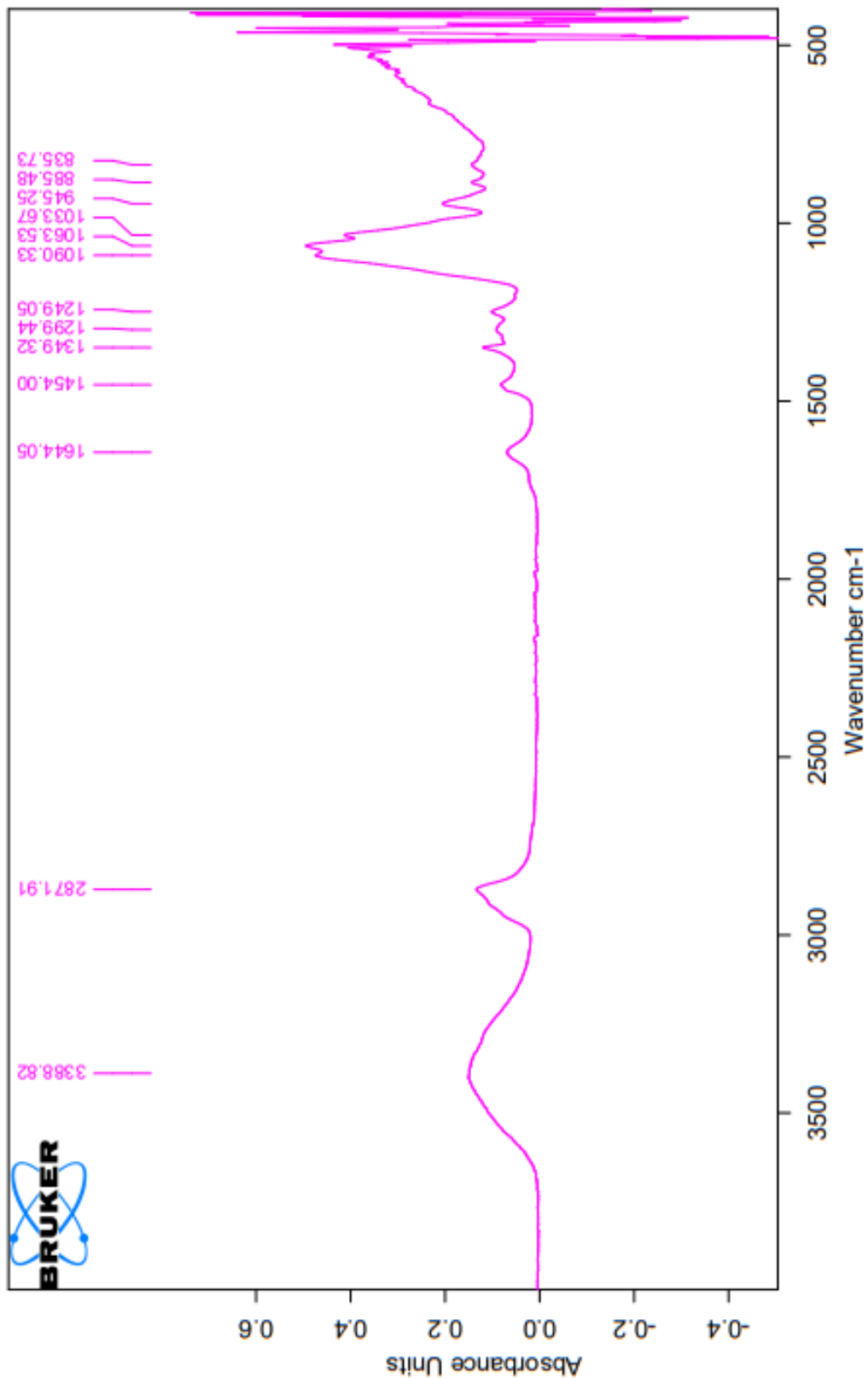


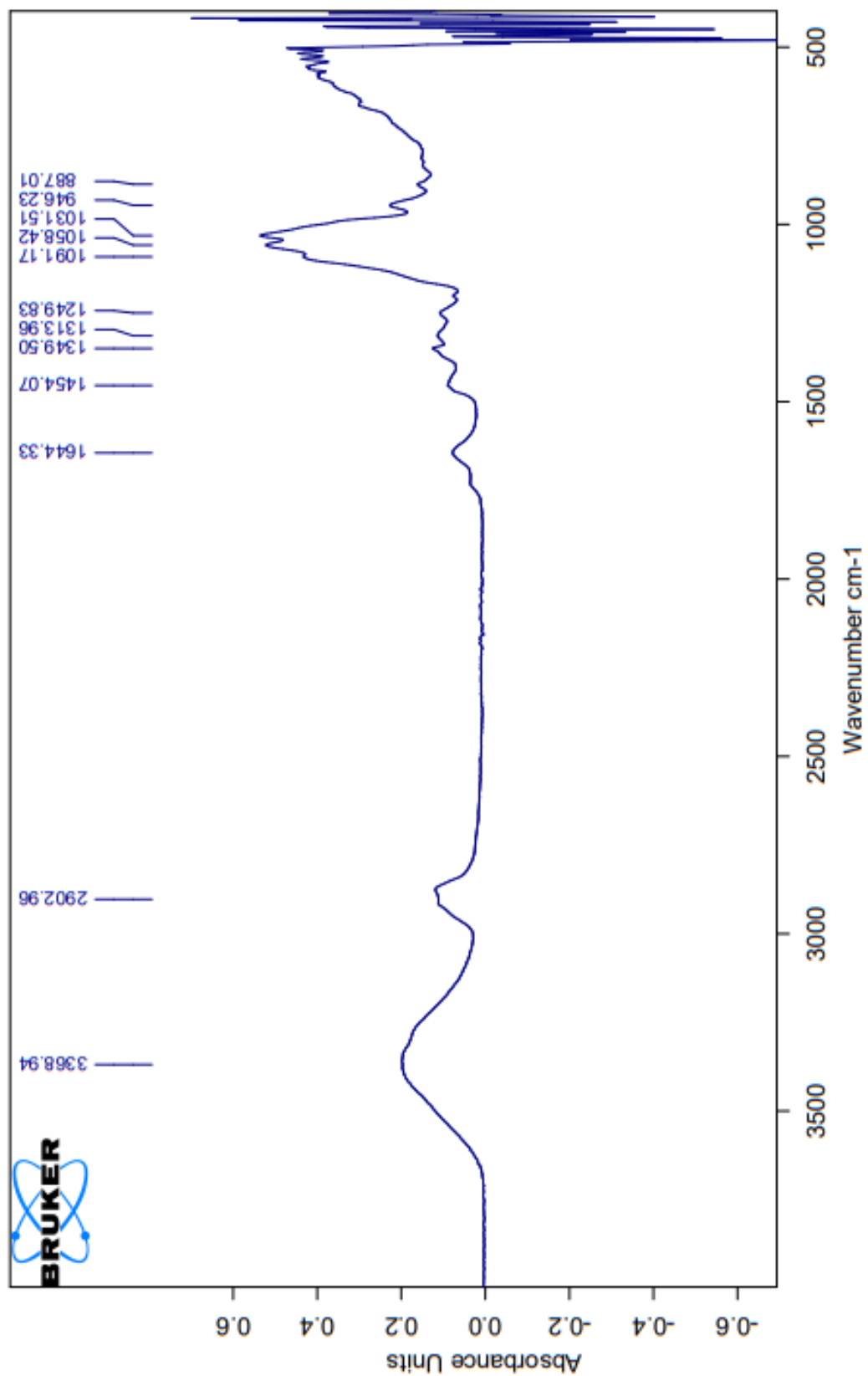
25/07/2023

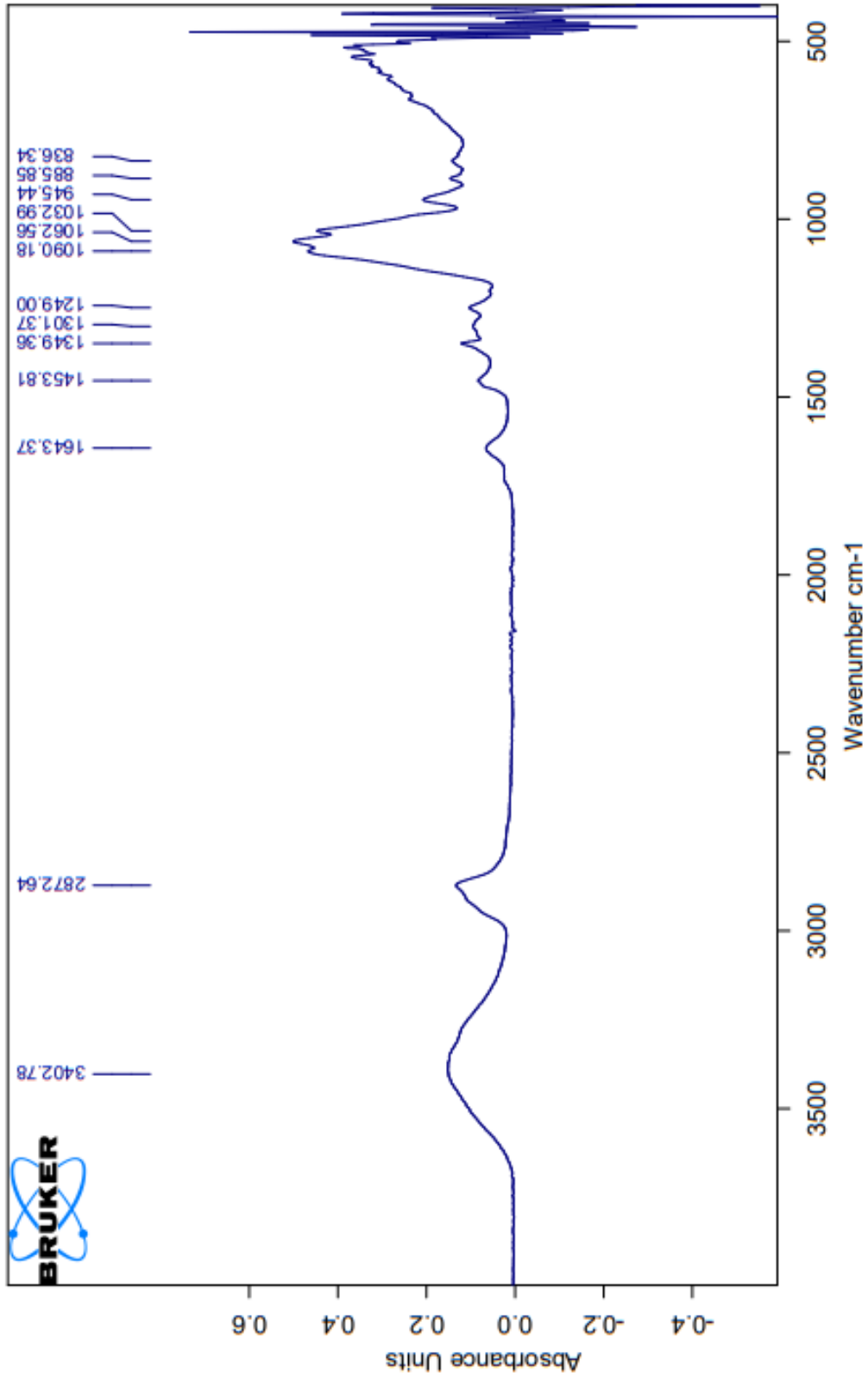
Instrument type and / or accessory

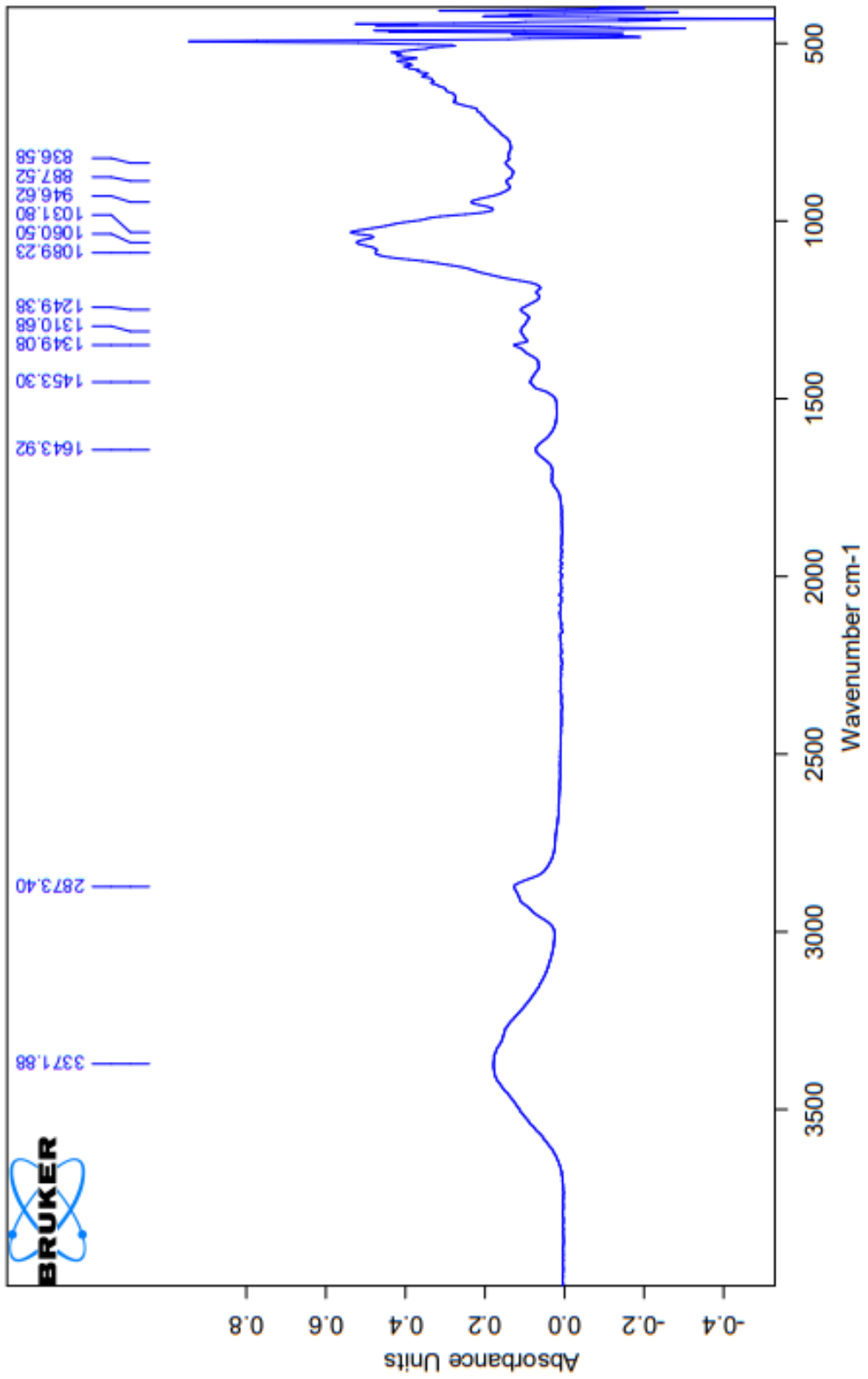
MEMBRAN 2

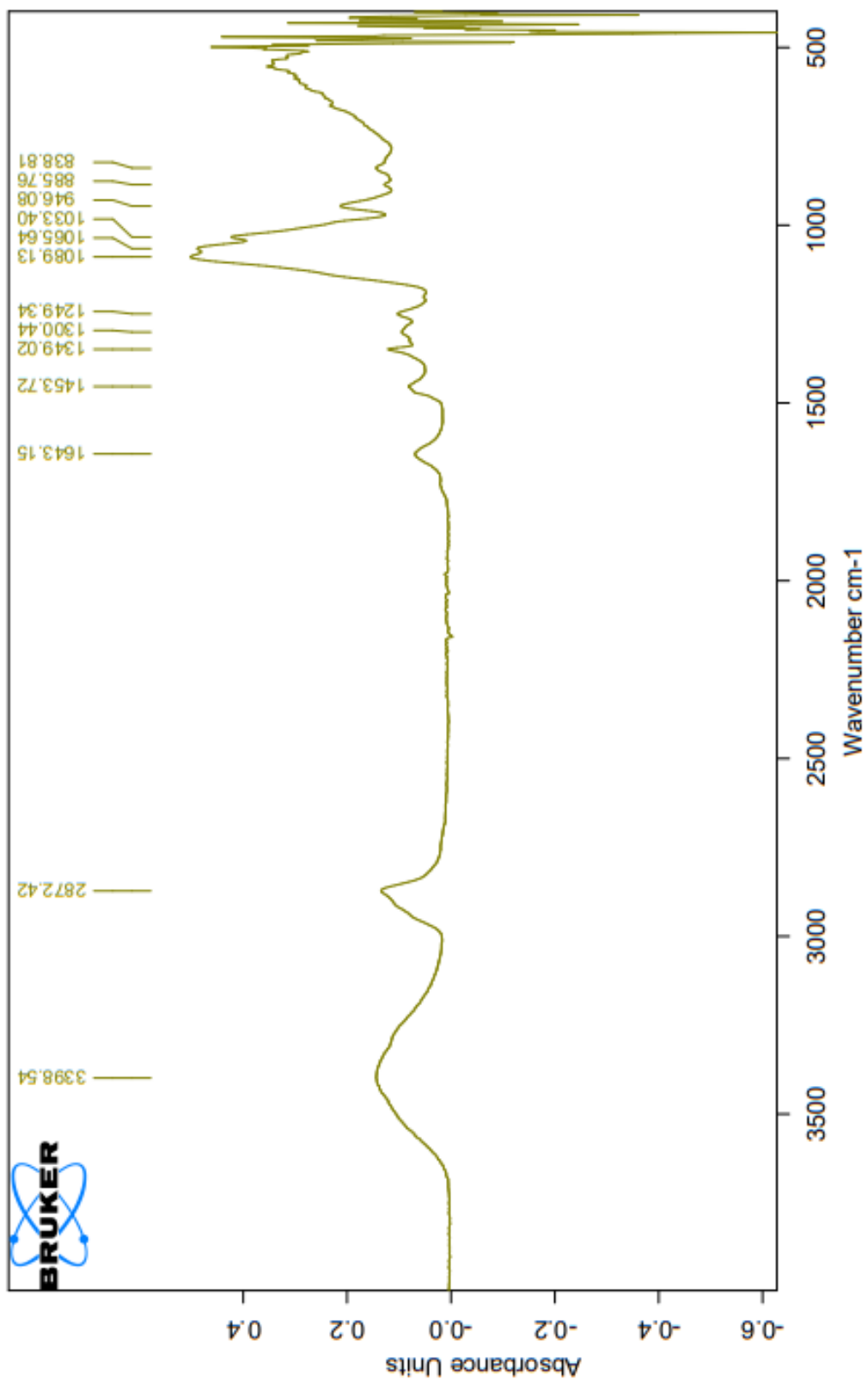
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25/07/2023

Instrument type and / or accessory

MEMBRAN 7

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C. HASIL PENGUJIAN EFEKTIVITAS

Natural gas	
O2	20.76 %
CO	1109 ppm
NO	6 ppm
NOx	7 ppm
SO2	0 ppm
CxHy	600 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	32.3 °C
deltaT	--- °C
Draft	-11 Pa
X Air	--- %
Smoke	2

Notes :
SA 1% 25 gr, Tanpa PEG

Input
Variasi waktu = 15 menit

Natural gas	
O2	20.72 %
CO	1221 ppm
NO	7 ppm
NOx	7 ppm
SO2	--- ppm
CxHy	600 ppm
CO2	0.2 %
Eff. (eta)	--- %
T flue	--- °C
T air	33.1 °C
deltaT	--- °C
Draft	-13 Pa
X Air	--- %
Smoke	2

Notes :
SA 1% 25 gr, Tanpa PEG

Variasi waktu = input

Natural gas	
O2	20.90 %
CO	286 ppm
NO	0 ppm
NOx	0 ppm
SO2	0 ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	32.5 °C
deltaT	--- °C
Draft	-10 Pa
X Air	--- %
Smoke	2

Notes :
SA 1% 25 gr, Tanpa PEG 400

15 Menit

Natural gas	
O2	20.85 %
CO	313 ppm
NO	0 ppm
NOx	0 ppm
SO2	6 ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	32.7 °C
deltaT	--- °C
Draft	-13 Pa
X Air	--- %
Smoke	2

Notes :
SA 1% 25 gr, Tanpa PEG 400

30 menit

Natural gas	
O2	20.85 %
CO	318 ppm
NO	0 ppm
NOx	0 ppm
SO2	3 ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	33.0 °C
deltaT	--- °C
Draft	-13 Pa
X Air	--- %
Smoke	2

Notes :
SA 1% 25 gr, Tanpa PEG

30 Menit

Natural gas	
O2	20.76 %
CO	338 ppm
NO	0 ppm
NOx	0 ppm
SO2	4 ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	34.0 °C
deltaT	--- °C
Draft	-16 Pa
X Air	--- %
Smoke	2

Notes :
SA 1% 25 gr, Tanpa PEG

45 Menit

Natural gas	
O2	20.84 %
CO	340 ppm
NO	0 ppm
NOx	0 ppm
SO2	4 ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	33.0 °C
deltaT	--- °C
Draft	-15 Pa
X Air	--- %
Smoke	2

Notes :
SA 1%, 25 gr ; Tanpa PEG
45 Menit

Natural gas	
O2	20.76 %
CO	363 ppm
NO	0 ppm
NOx	0 ppm
SO2	4 ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	34.0 °C
deltaT	--- °C
Draft	-16 Pa
X Air	--- %
Smoke	2

Notes :
SA 1%, 25 gr ; Tanpa PEG
60 Menit / 1 Jam

Natural gas	
O2	20.76 %
CO	374 ppm
NO	0 ppm
NOx	0 ppm
SO2	4 ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	34.0 °C
deltaT	--- °C
Draft	-15 Pa
X Air	--- %
Smoke	2

Notes :
SA 1%, 25 gr ; Tanpa PEG
60 menit / 1 Jam

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Natural gas	
O2	20.77 %
CO	282 ppm
NO	3 ppm
NOx	4 ppm
SO2	7 ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	33.6 °C
deltaT	--- °C
Draft	-18 Pa
X Air	--- %
Smoke	2

Notes :
SA 1% 25 gr, Tanpa PEG 400
15 Menit

Natural gas	
O2	21.07 %
CO	1273 ppm
NO	14 ppm
NOx	15 ppm
SO2	3 ppm
CxHy	900 ppm
CO2	--- %
Eff. (eta)	--- %
T flue	--- °C
T air	22.1 °C
deltaT	--- °C
Draft	0 Pa
X Air	--- %
Smoke	2

Notes :
SA 1%, 25 gr ; PEG 400 4 ml
Input

Natural gas	
O2	20.26 %
CO	1176 ppm
NO	21 ppm
NOx	23 ppm
SO2	0 ppm
CxHy	800 ppm
CO2	0.4 %
Eff. (eta)	--- %
T flue	--- °C
T air	24.4 °C
deltaT	--- °C
Draft	-7 Pa
X Air	--- %
Smoke	2

Notes :
SA 1% 25 gr, PEG 400 4%
Input

Natural gas		
O2	20.74	%
CO	162	ppm
NO	3	ppm
NOx	3	ppm
SO2	3	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	27.3	°C
deltaT	---	°C
Draft	-11	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr ; PEG 400 4ml		
15 Ment		

Natural gas		
O2	20.90	%
CO	143	ppm
NO	0	ppm
NOx	0	ppm
SO2	2	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	28.6	°C
deltaT	---	°C
Draft	-10	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr ; PEG 400 4ml		
15 Ment		

Natural gas		
O2	20.83	%
CO	173	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	28.2	°C
deltaT	---	°C
Draft	-4	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr ; PEG 400 4ml		
30 Ment		

Natural gas		
O2	20.90	%
CO	172	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	28.8	°C
deltaT	---	°C
Draft	-5	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr ; PEG 400 4ml		
30 Ment		

Natural gas		
O2	20.90	%
CO	174	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	28.4	°C
deltaT	---	°C
Draft	-4	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr ; PEG 400 4ml		
45 Ment		

Natural gas		
O2	20.75	%
CO	174	ppm
NO	4	ppm
NOx	4	ppm
SO2	3	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	26.9	°C
deltaT	---	°C
Draft	-9	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr ; PEG 400 4ml		
45 Ment		

Natural gas		
O2	20.81	%
CO	187	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	28.0	°C
deltaT	---	°C
Draft	-4	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr ; PEG 400 4 mL		
60 Menit		

Natural gas		
O2	20.90	%
CO	183	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	28.3	°C
deltaT	---	°C
Draft	-4	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr ; PEG 400 4 mL		
60 Menit		

Natural gas		
O2	20.72	%
CO	1115	ppm
NO	13	ppm
NOx	14	ppm
SO2	---	ppm
CxHy	800	ppm
CO2	0.2	%
Eff. (eta)	---	%
T flue	---	°C
T air	24.8	°C
deltaT	---	°C
Draft	-7	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr ; 8 mL PEG 400		
Input		

Natural gas		
O2	20.64	%
CO	1208	ppm
NO	13	ppm
NOx	14	ppm
SO2	---	ppm
CxHy	800	ppm
CO2	0.2	%
Eff. (eta)	---	%
T flue	---	°C
T air	26.2	°C
deltaT	---	°C
Draft	-10	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr ; 8 mL PEG 400		
Input		

Natural gas		
O2	20.70	%
CO	137	ppm
NO	0	ppm
NOx	0	ppm
SO2	4	ppm
CxHy	0	ppm
CO2	0.2	%
Eff. (eta)	---	%
T flue	---	°C
T air	28.6	°C
deltaT	---	°C
Draft	-14	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr ; 8 mL PEG 400		
15 Menit		

Natural gas		
O2	20.75	%
CO	152	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	30.2	°C
deltaT	---	°C
Draft	-16	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr ; 8 mL PEG 400		
15 Menit		

Natural gas		
O2	20.72	%
CO	187	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.2	%
Eff. (eta)	---	%
T flue	---	°C
T air	29.8	°C
deltaT	---	°C
Draft	-16	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr; 8 ml PEG 400		
30 Minit		

Natural gas		
O2	20.71	%
CO	184	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.2	%
Eff. (eta)	---	%
T flue	---	°C
T air	28.0	°C
deltaT	---	°C
Draft	-13	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr; 8 ml PEG 400		
30 Minit		

Natural gas		
O2	20.75	%
CO	230	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	28.5	°C
deltaT	---	°C
Draft	-8	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr; 8 ml PEG 400		
45 Minit		

Natural gas		
O2	20.68	%
CO	200	ppm
NO	2	ppm
NOx	2	ppm
SO2	3	ppm
CxHy	0	ppm
CO2	0.2	%
Eff. (eta)	---	%
T flue	---	°C
T air	28.6	°C
deltaT	---	°C
Draft	-14	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr; 8 ml PEG 400		
45 Minit		

Natural gas		
O2	20.78	%
CO	232	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	30.1	°C
deltaT	---	°C
Draft	-12	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr; 8 ml PEG 400		
60 Minit		

Natural gas		
O2	20.72	%
CO	252	ppm
NO	0	ppm
NOx	0	ppm
SO2	2	ppm
CxHy	0	ppm
CO2	0.2	%
Eff. (eta)	---	%
T flue	---	°C
T air	30.3	°C
deltaT	---	°C
Draft	-17	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 25 gr; 8 ml PEG 400		
60 Minit		

Natural gas		
O2	20.70	%
CO	1084	ppm
NO	10	ppm
NOx	10	ppm
SO2	---	ppm
CxHy	600	ppm
CO2	0.2	%
Eff. (eta)	---	%
T flue	---	°C
T air	30.9	°C
deltaT	---	°C
Draft	-17	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 50gr; 4ml PEG 400		
Input		

Natural gas		
O2	20.11	%
CO	1293	ppm
NO	16	ppm
NOx	17	ppm
SO2	---	ppm
CxHy	700	ppm
CO2	0.5	%
Eff. (eta)	---	%
T flue	---	°C
T air	31.3	°C
deltaT	---	°C
Draft	-18	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 50 gr; 4ml PEG 400		
Input		

Natural gas		
O2	20.84	%
CO	219	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	31.9	°C
deltaT	---	°C
Draft	-13	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 50 gr; PEG 400 4ml		
15 Menit		

Natural gas		
O2	20.80	%
CO	223	ppm
NO	0	ppm
NOx	0	ppm
SO2	2	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.1	°C
deltaT	---	°C
Draft	-19	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 50gr; 4ml PEG 400		
15 Menit		

Natural gas		
O2	20.84	%
CO	236	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.1	°C
deltaT	---	°C
Draft	-13	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50 gr; 4ml PEG 400		
30 Menit		

Natural gas		
O2	20.84	%
CO	236	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.1	°C
deltaT	---	°C
Draft	-13	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50 gr; 4ml PEG 400		
30 Menit		

Natural gas		
O2	20.79	%
CO	256	ppm
NO	0	ppm
NOx	0	ppm
SO2	3	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.1	°C
deltaT	---	°C
Draft	-18	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 50 gr ; PEG 400 4ml		
45 Minut		

Natural gas		
O2	20.85	%
CO	257	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.1	°C
deltaT	---	°C
Draft	-13	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50 gr ; 4ml PEG 400		
45 Minut		

Natural gas		
O2	20.85	%
CO	298	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.2	°C
deltaT	---	°C
Draft	-13	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 50gr ; 4ml PEG 400		
60 Minut		

Natural gas		
O2	20.80	%
CO	292	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.3	°C
deltaT	---	°C
Draft	-19	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 50 gr ; 4ml PEG 400		
60 Minut		

Natural gas		
O2	20.73	%
CO	1109	ppm
NO	10	ppm
NOx	11	ppm
SO2	---	ppm
CxHy	600	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.4	°C
deltaT	---	°C
Draft	-19	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 50 gr ; 8ml PEG 400		
Input		

Natural gas		
O2	20.25	%
CO	1357	ppm
NO	11	ppm
NOx	12	ppm
SO2	---	ppm
CxHy	800	ppm
CO2	0.4	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.4	°C
deltaT	---	°C
Draft	-20	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1%, 50gr ; 8ml PEG 400		
Input		

Natural gas		
O2	20.90	%
CO	343	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.4	°C
deltaT	---	°C
Draft	-14	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50gr; 8ml PEG 400		
15 Menit		

Natural gas		
O2	20.82	%
CO	240	ppm
NO	0	ppm
NOx	0	ppm
SO2	3	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.4	°C
deltaT	---	°C
Draft	-20	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50gr; 8ml PEG 400		
15 Menit		

Natural gas		
O2	20.82	%
CO	266	ppm
NO	0	ppm
NOx	0	ppm
SO2	3	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.4	°C
deltaT	---	°C
Draft	-19	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50 gr; 8 ml PEG 400		
30 Menit		

Natural gas		
O2	20.90	%
CO	365	ppm
NO	0	ppm
NOx	0	ppm
SO2	---	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.4	°C
deltaT	---	°C
Draft	-16	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50gr; 8ml PEG 400		
30 Menit		

Natural gas		
O2	20.80	%
CO	301	ppm
NO	0	ppm
NOx	0	ppm
SO2	3	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.4	°C
deltaT	---	°C
Draft	-19	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50 gr; 8ml PEG 400		
45 Menit		

Natural gas		
O2	20.84	%
CO	385	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.4	°C
deltaT	---	°C
Draft	-14	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50 gr ; 8 ml PEG 400		
45 Menit		

Natural gas		
O2	20.80	%
CO	390	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.4	°C
deltaT	---	°C
Draft	-19	Pa
X Air	---	%
Smoke	2	

Notes :
SA 1% 50 gr; 8ml PEG 400

60 Menit

Natural gas		
O2	20.90	%
CO	330	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.4	°C
deltaT	---	°C
Draft	-22	Pa
X Air	---	%
Smoke	2	

Notes :
SA 1% 50 gr; 8ml PEG 400

60 Menit

Natural gas		
O2	20.90	%
CO	0	ppm
NO	---	ppm
NOx	---	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	---	°C
deltaT	---	°C
Draft	-22	Pa
X Air	---	%
Smoke	2	

Notes :
SA 1% 50 gr; 4 ml PEG 400

Input

Natural gas		
O2	20.77	%
CO	1234	ppm
NO	11	ppm
NOx	11	ppm
SO2	---	ppm
CxHy	700	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	32.4	°C
deltaT	---	°C
Draft	-23	Pa
X Air	---	%
Smoke	2	

Notes :
SA 1% 50 gr; 4 ml PEG 600

Input

Natural gas		
O2	20.84	%
CO	282	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	29.8	°C
deltaT	---	°C
Draft	-6	Pa
X Air	---	%
Smoke	2	

Notes :
SA 1% 50 gr; 4 ml PEG 400

15 Menit

Natural gas		
O2	20.81	%
CO	339	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	29.8	°C
deltaT	---	°C
Draft	-14	Pa
X Air	---	%
Smoke	2	

Notes :
SA 1% 50 gr; 4 ml PEG 600

15 Menit

Natural gas		
O2	20.82	%
CO	321	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	29.9	°C
deltaT	---	°C
Draft	-9	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50 grs ; 4ml PEG 600		
30 Menit		

Natural gas		
O2	20.81	%
CO	318	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	29.9	°C
deltaT	---	°C
Draft	-14	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50 grs ; 4ml PEG 600		
30 Menit		

Natural gas		
O2	20.79	%
CO	373	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	30.0	°C
deltaT	---	°C
Draft	-15	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50grs ; 4ml PEG 600		
45 Menit		

Natural gas		
O2	20.80	%
CO	289	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	30.0	°C
deltaT	---	°C
Draft	-15	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50grs ; 4ml PEG 600		
45 Menit		

Natural gas		
O2	20.83	%
CO	355	ppm
NO	0	ppm
NOx	0	ppm
SO2	---	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	30.0	°C
deltaT	---	°C
Draft	-10	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50grs ; 4ml PEG 600		
60 Menit		

Natural gas		
O2	20.82	%
CO	329	ppm
NO	0	ppm
NOx	0	ppm
SO2	0	ppm
CxHy	0	ppm
CO2	0.1	%
Eff. (eta)	---	%
T flue	---	°C
T air	29.8	°C
deltaT	---	°C
Draft	-13	Pa
X Air	---	%
Smoke	2	
Notes :		
SA 1% 50grs ; 4ml PEG 600		
60 Menit		

Natural gas	
O2	20.71 %
CO	1155 ppm
NO	21 ppm
NOx	22 ppm
SO2	--- ppm
CxHy	700 ppm
CO2	0.2 %
Eff. (eta)	--- %
T flue	--- °C
T air	28.7 °C
deltaT	--- °C
Draft	-12 Pa
X Air	--- %
Smoke	2
Notes :	
SA 1% SOgr; 8ml PEG 600	
Input	

Natural gas	
O2	20.58 %
CO	1319 ppm
NO	18 ppm
NOx	19 ppm
SO2	--- ppm
CxHy	800 ppm
CO2	0.2 %
Eff. (eta)	--- %
T flue	--- °C
T air	28.7 °C
deltaT	--- °C
Draft	-12 Pa
X Air	--- %
Smoke	2
Notes :	
SA 1% SOgr; 8ml PEG 600	
Input	

Natural gas	
O2	20.82 %
CO	336 ppm
NO	0 ppm
NOx	0 ppm
SO2	--- ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	29.3 °C
deltaT	--- °C
Draft	-8 Pa
X Air	--- %
Smoke	2
Notes :	
SA 1% SOgr; 8ml PEG 600	
15 Menit	

Natural gas	
O2	20.77 %
CO	347 ppm
NO	3 ppm
NOx	3 ppm
SO2	0 ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	29.8 °C
deltaT	--- °C
Draft	-14 Pa
X Air	--- %
Smoke	2
Notes :	
SA 1% SOgr; 8ml PEG 600	
15 Menit	

Natural gas	
O2	20.81 %
CO	375 ppm
NO	0 ppm
NOx	0 ppm
SO2	--- ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	29.8 °C
deltaT	--- °C
Draft	-8 Pa
X Air	--- %
Smoke	2
Notes :	
SA 1% SOgr; 8ml PEG 600	
30 Menit	

Natural gas	
O2	20.74 %
CO	331 ppm
NO	7 ppm
NOx	8 ppm
SO2	0 ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	29.5 °C
deltaT	--- °C
Draft	-14 Pa
X Air	--- %
Smoke	2
Notes :	
SA 1% SOgr; 8ml PEG 600	
30 Menit	

Natural gas	
O2	20.81 %
CO	448 ppm
NO	9 ppm
NOx	0 ppm
SO2	--- ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	29.5 °C
deltaT	--- °C
Draft	-8 Pa
X Air	--- %
Smoke	2
Notes :	
SA 1% soqr; 8ml PCB 600	
45 Menit	

Natural gas	
O2	20.76 %
CO	280 ppm
NO	2 ppm
NOx	3 ppm
SO2	0 ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	29.3 °C
deltaT	--- °C
Draft	-14 Pa
X Air	--- %
Smoke	2
Notes :	
SA 1% soqr; 8ml PCB 600	
45 Menit	

Natural gas	
O2	20.82 %
CO	416 ppm
NO	0 ppm
NOx	0 ppm
SO2	--- ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	29.6 °C
deltaT	--- °C
Draft	-7 Pa
X Air	--- %
Smoke	2
Notes :	
SA 1% soqr; 8ml PCB 600	
60 Menit	

Natural gas	
O2	20.74 %
CO	331 ppm
NO	8 ppm
NOx	8 ppm
SO2	2 ppm
CxHy	0 ppm
CO2	0.1 %
Eff. (eta)	--- %
T flue	--- °C
T air	29.6 °C
deltaT	--- °C
Draft	-14 Pa
X Air	--- %
Smoke	2
Notes :	
SA 1% soqr, 8ml PCB 600	
60 Menit	

LAMPIRAN 4
BIODATA PENULIS



Nama : Mustafidatul Khasanah
Tempat Tanggal Lahir : Kebumen, 11 Mei 2001
Alamat : Jalan Kejayan, RT 006/RW 003, Tanjungrejo,
Buluspesantren, Kebumen
Telepon : 0882-1265-9758
Email : mustafidatulkhasanah11@gmail.com
Hobi : Traveling dan Kulineran
Motto : “Jarib wa Laahidzh Takun A’arifan”
(Cobalah dan perhatikanlah maka kamu akan
menjadi orang yang tahu)

Riwayat Pendidikan:

1. MI KHR. ILYAS TANJUNGREJO : Tahun 2007 - 2013
2. MTs N 2 KEBUMEN : Tahun 2013 - 2016
3. MAN 2 KEBUMEN : Tahun 2016 - 2019
4. POLITEKNIK NEGERI CILACAP : Tahun 2019 – 2023

Penulis telah mengikuti Sidang Tugas Akhir pada tanggal 1 Agustus 2023, sebagai salah satu persyaratan untuk memperoleh gelar Sarjana Terapan (S.Tr).