# LAMPIRAN 1
# PERHITUNGAN DATA PENELITIAN

## A. Perhitungan Kadar Air

**Pengujian dilakukan 2 kali (*duplo*)**

% Kadar air = $\frac{w1}{w2} \times 100\%$

Keterangan :

$W_1$ = Kehilangan bobot contoh (g)

$W_2$ = Bobot contoh (g)

### 1. Kadar Air 100 mesh

### 1.1 Pengujian Pertama

Massa cawan + sampel sebelum dioven = 18,50 g

Massa cawan + sampel setelah dioven = 18,46 g

$W_1$ = (Massa cawan + sampel sebelum dioven) – (Massa cawan + sampel setelah dioven) = (18,50 g – 18,46 g) = 0,04 g

$W_2$ = 1 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

= $\frac{0,04}{1} \times 100\%$

= 4 %

### 1.2 Pengujian Kedua

Massa cawan + sampel sebelum dioven = 19,16 g

Massa cawan + sampel setelah dioven = 19,13 g

$W_1$ = (Massa cawan + sampel sebelum dioven) – (Massa cawan + sampel setelah dioven) = (19,16 g – 19,13 g) = 0,03 g

$W_2$ = 1 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

= $\frac{0,03}{1} \times 100\%$

= 3 %

## 2. Kadar Air 100 mesh, 1 M

### 2.1 Pengujian Pertama

Massa cawan + sampel sebelum dioven = 43,49 g

Massa cawan + sampel setelah dioven = 43,46 g

$W_1$ = (Massa cawan + sampel sebelum dioven) – (Massa cawan + sampel setelah dioven) = (43,49 g – 43,46 g) = 0,03 g

$W_2$ = 1 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

= $\frac{0,03}{1} \times 100\%$

= 3 %

### 2.2 Pengujian Kedua

Massa cawan + sampel sebelum dioven = 42,70 g

Massa cawan + sampel setelah dioven = 42,67 g

$W_1$ = (Massa cawan + sampel sebelum dioven) – (Massa cawan + sampel setelah dioven) = (42,70 g – 42,67 g) = 0,03 g

$W_2$ = 1 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

= $\frac{0,03}{1} \times 100\%$

= 3 %

## 3. Kadar Air 100 mesh, 2 M

### 3.1 Pengujian Pertama

Massa cawan + sampel sebelum dioven = 42,70 g

Massa cawan + sampel setelah dioven = 42,68 g

$W_1$ = (Massa cawan + sampel sebelum dioven) – (Massa cawan + sampel setelah dioven) = (42,70 g – 42,68 g) = 0,02 g

$W_2$ = 1 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

$= \frac{0,02}{1} \times 100\%$

= 2 %

**3.2 Pengujian Kedua**

Massa cawan + sampel sebelum dioven = 45,47 g

Massa cawan + sampel setelah dioven = 45,44 g

$W_1$ = (Massa cawan + sampel sebelum dioven) – (Massa cawan + sampel setelah dioven) = (45,47 g – 45,44 g) = 0,03 g

$W_2$ = 1 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

$= \frac{0,03}{1} \times 100\%$

= 3 %

**4. Kadar Air 60 mesh, 3 M**

**4.1 Pengujian Pertama**

Massa cawan + sampel sebelum dioven = 49,42 g

Massa cawan + sampel setelah dioven = 49,42 g

$W_1$ = (Massa cawan + sampel sebelum dioven) – (Massa cawan + sampel setelah dioven) = (49,42 g – 49,42 g) = 0 g

$W_2$ = 1 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

$= \frac{0}{1} \times 100\%$

= 0 %

**4.2 Pengujian Kedua**

Massa cawan + sampel sebelum dioven = 39,14 g

Massa cawan + sampel setelah dioven = 39,12 g

$W_1$ = (Massa cawan + sampel sebelum dioven) – (Massa cawan + sampel setelah dioven) = (39,14 g – 39,12 g) = 0,02 g

$W_2$ = 1 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

$= \frac{0,02}{1} \times 100\%$

$= 2\ \%$

**5. Kadar Air 80 mesh, 3 M**

**5.1 Pengujian Pertama**

Massa cawan + sampel sebelum dioven = 47,65 g

Massa cawan + sampel setelah dioven = 47,63 g

$W_1$ = (Massa cawan + sampel sebelum dioven) – (Massa cawan + sampel setelah dioven) = (47,65 – 47,63 g) = 0,02 g

$W_2$ = 1 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

$= \frac{0,02}{1} \times 100\%$

$= 2\ \%$

**5.2 Pengujian Kedua**

Massa cawan + sampel sebelum dioven = 433,00 g

Massa cawan + sampel setelah dioven = 42,98 g

$W_1$ = (Massa cawan + sampel sebelum dioven) – (Massa cawan + sampel setelah dioven) = (38,97 g – 38,9 g) = 2 g

$W_2$ = 1 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

$= \frac{0,02}{1} \times 100\%$

$= 2\ \%$

**6. Kadar Air 100 mesh, 3 M**

**6.1 Pengujian Pertama**

Massa cawan + sampel sebelum dioven = 43,28 g

Massa cawan + sampel setelah dioven = 43,21 g

$W_1$ = (Massa cawan + sampel sebelum dioven) – (Massa cawan + sampel setelah dioven) = (43,28 g – 43,21 g) = 0,01 g

$W_2$ = 1 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

$= \frac{0,01}{1} \times 100\%$

= 1 %

**6.2 Pengujian Kedua**

Massa cawan + sampel sebelum dioven = 38,97 g

Massa cawan + sampel setelah dioven = 38,97 g

$W_1$ = (Massa cawan + sampel sebelum dioven) – (Massa cawan + sampel setelah dioven) = (38,97 g – 38,97 g) = 0 g

$W_2$ = 1 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

$= \frac{0}{1} \times 100\%$

= 0 %

**B. Perhitungan Kadar Abu**

% Kadar air = $\frac{w1}{w2} \times 100\%$

Keterangan :

$W_1$ = Sisa Pijar (g)

$W_2$ = Bobot Contoh (g)

**1. Kadar Abu 100 mesh**

**1.1 Pengujian Pertama**

Massa cawan kosong = 43,30 g

Massa cawan kosong + sampel setelah difurnace = 43,45 g

$W_1$ = (Massa cawan + sampel setelah dioven) – (Massa cawan kosong) = (43,45 g – 43,30 g) = 0,15 g

$W_2$ = 2 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

$= \frac{0,15}{2} \times 100\%$

= 7,5 %

### 1.2 Pengujian kedua

Massa cawan kosong = 46,68 g

Massa cawan kosong + sampel setelah difurnace = 46,85g

$W_1$ = (Massa cawan + sampel setelah dioven) – (Massa cawan kosong) = (46,85 g – 46,68 g) = 0,17 g

$W_2$ = 2 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

= $\frac{0,17}{2} \times 100\%$

= 8,5 %

## 2. Kadar Abu 100 mesh, 1 M

### 2.1 Pengujian Pertama

Massa cawan kosong = 42,18 g

Massa cawan kosong + sampel setelah difurnace = 42,29 g

$W_1$ = (Massa cawan + sampel setelah dioven) – (Massa cawan kosong) = (42,29 g – 42,18 g) = 0,11 g

$W_2$ = 2 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

= $\frac{0,11}{2} \times 100\%$

= 5,5 %

### 2.2 Pengujian kedua

Massa cawan kosong = 41,99 g

Massa cawan kosong + sampel setelah difurnace = 42,10 g

$W_1$ = (Massa cawan + sampel setelah dioven) – (Massa cawan kosong) = (42,10 g – 41,99 g) = 0,15 g

$W_2$ = 2 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

= $\frac{0,11}{2} \times 100\%$

= 5,5 %

**3. Kadar Abu 100 mesh, 2 M**

**3.1 Pengujian Pertama**

Massa cawan kosong = 20,04 g

Massa cawan kosong + sampel setelah difurnace = 20,13 g

$W_1$ = (Massa cawan + sampel setelah dioven) – (Massa cawan kosong) = (20,13 g – 20,04 g) = 0,09 g

$W_2$ = 2 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

= $\frac{0,09}{2} \times 100\%$

= 4,5 %

**3.1 Pengujian kedua**

Massa cawan kosong = 19,21 g

Massa cawan kosong + sampel setelah difurnace = 19,32 g

$W_1$ = (Massa cawan + sampel setelah dioven) – (Massa cawan kosong) = (19,32 g – 19,21 g) = 0,11 g

$W_2$ = 2 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

= $\frac{0,11}{2} \times 100\%$

= 5,5 %

**4. Kadar Abu 60 mesh, 3 M**

**4.1 Pengujian Pertama**

Massa cawan kosong = 20,02 g

Massa cawan kosong + sampel setelah difurnace = 20,11 g

$W_1$ = (Massa cawan + sampel setelah dioven) – (Massa cawan kosong) = (20,11 g – 20,02 g) = 0,09 g

$W_2$ = 2 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

= $\frac{0,09}{2} \times 100\%$

= 4,5 %

**4.2 Pengujian kedua**

Massa cawan kosong = 17,93 g

Massa cawan kosong + sampel setelah difurnace = 18,01 g

$W_1$ = (Massa cawan + sampel setelah dioven) – (Massa cawan kosong) = (18,01 g – 17,93 g) = 0,08 g

$W_2$ = 2 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

= $\frac{0,08}{2} \times 100\%$

= 4 %

**5. Kadar Abu 80 mesh, 3 M**

**5.1 Pengujian Pertama**

Massa cawan kosong = 18,04 g

Massa cawan kosong + sampel setelah difurnace = 18,17 g

$W_1$ = (Massa cawan + sampel setelah dioven) – (Massa cawan kosong) = (18,17 g – 18,04 g) = 0,13 g

$W_2$ = 2 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

= $\frac{0,13}{2} \times 100\%$

= 6,5 %

**5.2 Pengujian kedua**

Massa cawan kosong = 17,25 g

Massa cawan kosong + sampel setelah difurnace = 17,38 g

$W_1$ = (Massa cawan + sampel setelah dioven) – (Massa cawan kosong) = (17,38 g – 17,25 g) = 0,08 g

$W_2$ = 2 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

= $\frac{0,13}{2} \times 100\%$

= 6,5 %

**6. Kadar Abu 100 mesh, 3 M**

**6.1 Pengujian Pertama**

Massa cawan kosong = 17,62 g

Massa cawan kosong + sampel setelah difurnace = 17,70 g

$W_1$ = (Massa cawan + sampel setelah dioven) – (Massa cawan kosong) = (20,11 g – 20,02 g) = 0,08 g

$W_2$ = 2 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

$= \frac{0,08}{2} \times 100\%$

= 4 %

**6.2 Pengujian kedua**

Massa cawan kosong = 19,22 g

Massa cawan kosong + sampel setelah difurnace = 19,30 g

$W_1$ = (Massa cawan + sampel setelah dioven) – (Massa cawan kosong) = (18,01 g – 17,93 g) = 0,08 g

$W_2$ = 2 g

% Kadar air = $\frac{w1}{w2} \times 100\%$

$= \frac{0,08}{2} \times 100\%$

= 4 %

**C. Perhitungan Daya Serap Iodin**

Iodin yang diadsorpsi mg/g = $\frac{(10 - \frac{V \times N}{0,1}}{W} \times 12,69 \times 5$

Keterangan :

V = Larutan natrium tiosulfat yang diperlukan (mL)

N = Normalitas larutan natrium tiosulfat

12,69 = jumlah iodin sesuai dengan 1 ml larutan natrium tiosulfat 0,1 N

W = contoh (g)

**1. Daya Serap Iodin 100 mesh**

**1.1 Pengujian Pertama**

V = 1,9 mL

N = 0,1 N

W = 0,5 g

Iodin yang diadsorpsi mg/g = $\frac{(10 - \frac{V \times N}{0,1}}{W} \times 12,69 \times 5$

$= \frac{(10 - \frac{1,9 \times 0,1}{0,1}}{0,5} \times 12,69 \times 5$

= 1027,89 mg/g

**1.2 Pengujian kedua**

V = 1,8 mL

N = 0,1 N

W = 0,5 g

Iodin yang diadsorpsi mg/g = $\frac{(10 - \frac{V \times N}{0,1}}{W} \times 12,69 \times 5$

$= \frac{(10 - \frac{1,8 \times 0,1}{0,1}}{0,5} \times 12,69 \times 5$

= 1040,58 mg/g

**2. Daya Serap Iodin 100 mesh 1 M**

**2.1 Pengujian Pertama**

V = 1,5 mL

N = 0,1 N

W = 0,5 g

Iodin yang diadsorpsi mg/g = $\frac{(10 - \frac{V \times N}{0,1}}{W} \times 12,69 \times 5$

$= \frac{(10 - \frac{1,5 \times 0,1}{0,1}}{0,5} \times 12,69 \times 5$

= 1078,65 mg/

**2.2 Pengujian kedua**

V = 1,3 mL

N = 0,1 N

W = 0,5 g

Iodin yang diadsorpsi mg/g = $\frac{(10 - \frac{V \times N}{0,1}}{W} \times 12,69 \times 5$

$= \frac{(10 - \frac{1,3 \times 0,1}{0,1}}{0,5} \times 12,69 \times 5$

= 1104,03 mg/g

**3. Daya Serap Iodin 100 mesh 2 M**

**3.1 Pengujian Pertama**

V = 0,6 mL

N = 0,1 N

W = 0,5 g

Iodin yang diadsorpsi mg/g = $\frac{(10 - \frac{V \times N}{0,1}}{W} \times 12,69 \times 5$

$= \frac{(10 - \frac{0,6 \times 0,1}{0,1}}{0,5} \times 12,69 \times 5$

= 1192,86 mg/g

**3.2 Pengujian kedua**

V = 0,6 mL

N = 0,1 N

W = 0,5 g

Iodin yang diadsorpsi mg/g = $\frac{(10 - \frac{V \times N}{0,1}}{W} \times 12,69 \times 5$

$= \frac{(10 - \frac{0,6 \times 0,1}{0,1}}{0,5} \times 12,69 \times 5$

= 1192,86 mg/g

**4. Daya Serap Iodin 60 mesh 3 M**

**4.1 Pengujian Pertama**

V = 0,7 mL

N = 0,1 N

W = 0,5 g

Iodin yang diadsorpsi mg/g = $\frac{(10 - \frac{V \times N}{0,1}}{W} \times 12,69 \times 5$

$= \frac{(10 - \frac{0,7 \times 0,1}{0,1}}{0,5} \times 12,69 \times 5$

= 1180,17 mg/g

**4.2 Pengujian kedua**

V = 0,4 mL

N = 0,1 N

W = 0,5 g

Iodin yang diadsorpsi mg/g = $\frac{(10 - \frac{V \times N}{0,1}}{W} \times 12{,}69 \times 5$

$= \frac{(10 - \frac{0{,}4 \times 0{,}1}{0{,}1}}{0{,}5} \times 12{,}69 \times 5$

= 1218,24 mg/g

**5. Daya Serap Iodin 80 mesh 3 M**

**5.1 Pengujian Pertama**

V = 0,5 mL

N = 0,1 N

W = 0,5 g

Iodin yang diadsorpsi mg/g = $\frac{(10 - \frac{V \times N}{0,1}}{W} \times 12{,}69 \times 5$

$= \frac{(10 - \frac{0{,}5 \times 0{,}1}{0{,}1}}{0{,}5} \times 12{,}69 \times 5$

= 1205,55 mg/g

**5.2 Pengujian kedua**

V = 0,5 mL

N = 0,1 N

W = 0,5 g

Iodin yang diadsorpsi mg/g = $\frac{(10 - \frac{V \times N}{0,1}}{W} \times 12{,}69 \times 5$

$= \frac{(10 - \frac{0{,}5 \times 0{,}1}{0{,}1}}{0{,}5} \times 12{,}69 \times 5$

= 1205,55 mg/g

**6. Daya Serap Iodin 100 mesh 3 M**

**6.1 Pengujian Pertama**

V = 0,4 mL

N = 0,1 N

W = 0,5 g

Iodin yang diadsorpsi mg/g = $\frac{(10 - \frac{V \times N}{0,1}}{W} \times 12,69 \times 5$

$= \frac{(10 - \frac{0,4 \times 0,1}{0,1}}{0,5} \times 12,69 \times 5$

= 1218,24 mg/g

**6.2 Pengujian kedua**

V = 0,3 mL

N = 0,1 N

W = 0,5 g

Iodin yang diadsorpsi mg/g = $\frac{(10 - \frac{V \times N}{0,1}}{W} \times 12,69 \times 5$

$= \frac{(10 - \frac{0,3 \times 0,1}{0,1}}{0,5} \times 12,69 \times 5$

= 1230,93 mg/g

**D. Perhitungan Daya Serap *Metilen Blue***

Wads = $\frac{C1-C2}{1000} \times V \times \frac{1}{B}$

Keterangan:

$W_{ads}$ = berat metilen biru yang digunakan (mg/g)

B = berat sampel yang digunakan (g)

$C_1$ = konsentrasi larutan metilen biru awal (ppm)

$C_2$ = konsentrasi larutan metilen biru awal (ppm)

V = volume larutan metilen biru yang digunakan (mL)

**1. Daya Serap *Metilen Blue* 60 mesh**

**1.1 Pengujian Pertama**

$C_1$ = 500 ppm

$C_2$ = 5,578 ppm

V = 25 mL

B = 0,1 g

Wads = $\frac{C1-C2}{1000} \times V \times \frac{1}{B}$

= $\frac{500 - 5,578}{1000} \times 25 \times \frac{1}{0,1}$

= 123,60 mg/g

**2. Daya Serap *Metilen Blue* 80 mesh**

$C_1$ = 500 ppm

$C_2$ = 5,679 ppm

V = 25 mL

B = 0,1 g

Wads = $\frac{C1-C2}{1000} \times V \times \frac{1}{B}$

= $\frac{500 - 5,679}{1000} \times 25 \times \frac{1}{0,1}$

= 123,58 mg/g

**3. Daya Serap *Metilen Blue* 100 mesh**

$C_1$ = 500 ppm

$C_2$ = 5,556 ppm

V = 25 mL

B = 0,1 g

Wads = $\frac{C1-C2}{1000} \times V \times \frac{1}{B}$

= $\frac{500 - 5,556}{1000} \times 25 \times \frac{1}{0,1}$

= 123,61 mg/g

**4. Daya Serap *Metilen Blue* 100 mesh 1 M**

$C_1$ = 500 ppm

$C_2$ = 4,711 ppm

V = 25 mL

B = 0,1 g

Wads = $\frac{C1-C2}{1000} \times V \times \frac{1}{B}$

= $\frac{500 - 4,711}{1000} \times 25 \times \frac{1}{0,1}$

= 123,82 mg/g

5. **Daya Serap *Metilen Blue* 100 mesh 2 M**

$C_1$ = 500 ppm

$C_2$ = 2,864 ppm

V = 25 mL

B = 0,1 g

Wads = $\frac{C1-C2}{1000} \times V \times \frac{1}{B}$

= $\frac{500-2,864}{1000} \times 25 \times \frac{1}{0,1}$

= 124,28 mg/g

6. **Daya Serap *Metilen Blue* 60 mesh 3 M**

$C_1$ = 500 ppm

$C_2$ = 2,992 ppm

V = 25 mL

B = 0,1 g

Wads = $\frac{C1-C2}{1000} \times V \times \frac{1}{B}$

= $\frac{500-2,992}{1000} \times 25 \times \frac{1}{0,1}$

= 124,25 mg/g

7. **Daya Serap *Metilen Blue* 80 mesh 3 M**

$C_1$ = 500 ppm

$C_2$ = 1,898 ppm

V = 25 mL

B = 0,1 g

Wads = $\frac{C1-C2}{1000} \times V \times \frac{1}{B}$

= $\frac{500-1,898}{1000} \times 25 \times \frac{1}{0,1}$

= 124,52 mg/g

8. **Daya Serap *Metilen Blue* 100 mesh 3 M**

$C_1$ = 500 ppm

$C_2$ = 1,751 ppm

V = 25 mL

B = 0,1 g

Wads = $\frac{C1-C2}{1000} \times V \times \frac{1}{B}$

$= \frac{500 - 1{,}751}{1000} \times 25 \times \frac{1}{0{,}1}$

= 124,56 mg/g

**E. Perhitungan Kadar $CO_2$ Sebelum dan Sesudah Melalui Biogas Purifier**

Efektivitas penjerapan $CO_2$ = $\frac{kadar\ \mathrm{CO2}\ input - kadar\ \mathrm{CO2}\ Output}{\mathrm{kadar\ CO2}\ Input} \times 100\%$

Keterangan :

Input = Gas $CO_2$ sebelum melalui media filter

Output = Gas $CO_2$ sesudah melalui media filter

**1. Karbon Aktif dari Pelepah Nipah Terimpregnasi $H_3PO_4$ 3 M 100 mesh dengan laju alir 1 L/menit**

Input = 1,5 %

Output = 0,2 %

Efektivitas penjerapan $CO_2$ = $\frac{1{,}5 - 0{,}2}{1{,}5} \times 100\%$

= 86,67 %

**2. Karbon Aktif dari Pelepah Nipah Terimpregnasi $H_3PO_4$ 3 M 100 mesh dengan laju alir 1,5 L/menit**

Input = 0,5 %

Output = 0,1 %

Efektivitas penjerapan $CO_2$ = $\frac{0{,}5 - 0{,}1}{1{,}5} \times 100\%$

= 80 %

**3. Karbon Aktif dari Pelepah Nipah Terimpregnasi $H_3PO_4$ 3 M 100 mesh dengan laju alir 2 L/menit**

Input = 0,5 %

Output = 0,1 %

Efektivitas penjerapan $CO_2$ = $\frac{0{,}5 - 0{,}1}{1{,}5} \times 100\%$

= 80 %

**4. Karbon Aktif Komersil dengan laju alir 1 L/menit**

Input = 0,4 %

Output = 0,1 %

Efektivitas penjerapan $CO_2$ = $\frac{0,4 - 0,1}{1,5} \times 100\%$

= 75 %

**5. Karbon Aktif Komersil dengan laju alir 1,5 L/menit**

Input = 3,0 %

Output = 0,9 %

Efektivitas penjerapan $CO_2$ = $\frac{0,4 - 0,1}{1,5} \times 100\%$

= 70 %

**6. Karbon Aktif Komersil dengan laju alir 2 L/menit**

Input = 0,6 %

Output = 0,3 %

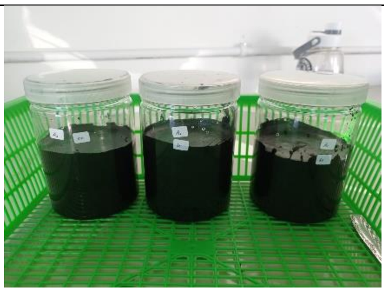
Efektivitas penjerapan $CO_2$ = $\frac{0,4 - 0,1}{1,5} \times 100\%$

= 50 %

**LAMPIRAN 2**

**DOKUMENTASI PENELITIAN**

| | |
|---|---|
| <br>Pengambilan pelepah nipah | <br>Pengeringan pelepah nipah |
| <br>Karbonisasi pelepah nipah | <br>Penimbangan pelepah nipah |
| <br>Hasil karbonisasi | <br>Proses pengayakan |

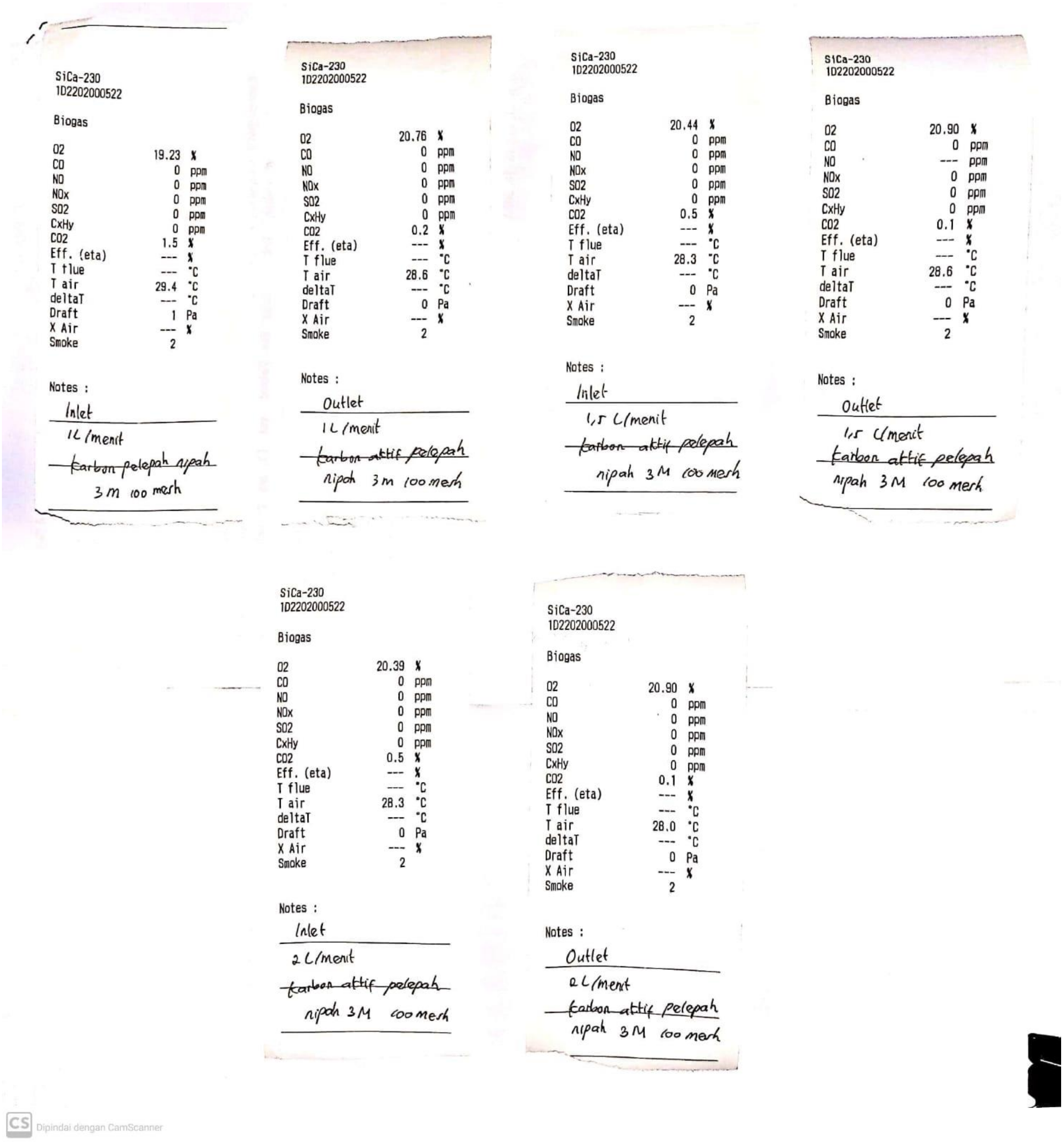
| | |
|---|---|
| <br>Pembuatan larutan $H_3PO_4$ | <br>Proses aktivasi |
| <br>Perendaman selama 24 jam | <br>Proses pencucian |
| <br>Penetralan sampai pH netral | <br>Proses pengeringan |
|  |  |

| | |
|---|---|
| Proses kalsinasi | Hasil Karbon setelah aktivasi impregnasi |
| <br>Pengujian kadar air | <br>Pengujian kadar abu |
| <br>Pengujian daya serap iod | <br>Pengujian daya serap metilen blue |
| <br>Pengujian FTIR | <br>Alat prototipe biogas |
| <br>Gas *Analyzer* | <br>Proses pengujian penjerapan $CO_2$ |

**LAMPIRAN 3**

**HASIL PENGUJIAN PENJERAPAN $CO_2$**

1. **Hasil penjerapan gas $CO_2$ menggunakan karbon aktif pelepah nipah terimpregnasi**



SiCa-230
1D2202000522

Biogas

| | | |
|---|---|---|
| O2 | 19.23 | % |
| CO | 0 | ppm |
| NO | 0 | ppm |
| NOx | 0 | ppm |
| SO2 | 0 | ppm |
| CxHy | 0 | ppm |
| CO2 | 1.5 | % |
| Eff. (eta) | --- | % |
| T flue | --- | °C |
| T air | 29.4 | °C |
| deltaT | --- | °C |
| Draft | 1 | Pa |
| X Air | --- | % |
| Smoke | 2 | |

Notes :
Inlet
1L/menit
karbon pelepah nipah
3M 100 mesh

SiCa-230
1D2202000522

Biogas

| | | |
|---|---|---|
| O2 | 20.76 | % |
| CO | 0 | ppm |
| NO | 0 | ppm |
| NOx | 0 | ppm |
| SO2 | 0 | ppm |
| CxHy | 0 | ppm |
| CO2 | 0.2 | % |
| Eff. (eta) | --- | % |
| T flue | --- | °C |
| T air | 28.6 | °C |
| deltaT | --- | °C |
| Draft | 0 | Pa |
| X Air | --- | % |
| Smoke | 2 | |

Notes :
Outlet
1L/menit
karbon aktif pelepah
nipah 3M 100 mesh

SiCa-230
1D2202000522

Biogas

| | | |
|---|---|---|
| O2 | 20.44 | % |
| CO | 0 | ppm |
| NO | 0 | ppm |
| NOx | 0 | ppm |
| SO2 | 0 | ppm |
| CxHy | 0 | ppm |
| CO2 | 0.5 | % |
| Eff. (eta) | --- | % |
| T flue | --- | °C |
| T air | 28.3 | °C |
| deltaT | --- | °C |
| Draft | 0 | Pa |
| X Air | --- | % |
| Smoke | 2 | |

Notes :
Inlet
1,5 L/menit
karbon aktif pelepah
nipah 3M 100 mesh

SiCa-230
1D2202000522

Biogas

| | | |
|---|---|---|
| O2 | 20.90 | % |
| CO | 0 | ppm |
| NO | --- | ppm |
| NOx | 0 | ppm |
| SO2 | 0 | ppm |
| CxHy | 0 | ppm |
| CO2 | 0.1 | % |
| Eff. (eta) | --- | % |
| T flue | --- | °C |
| T air | 28.6 | °C |
| deltaT | --- | °C |
| Draft | 0 | Pa |
| X Air | --- | % |
| Smoke | 2 | |

Notes :
Outlet
1,5 L/menit
karbon aktif pelepah
nipah 3M 100 mesh

SiCa-230
1D2202000522

Biogas

| | | |
|---|---|---|
| O2 | 20.39 | % |
| CO | 0 | ppm |
| NO | 0 | ppm |
| NOx | 0 | ppm |
| SO2 | 0 | ppm |
| CxHy | 0 | ppm |
| CO2 | 0.5 | % |
| Eff. (eta) | --- | % |
| T flue | --- | °C |
| T air | 28.3 | °C |
| deltaT | --- | °C |
| Draft | 0 | Pa |
| X Air | --- | % |
| Smoke | 2 | |

Notes :
Inlet
2 L/menit
karbon aktif pelepah
nipah 3M 100 mesh

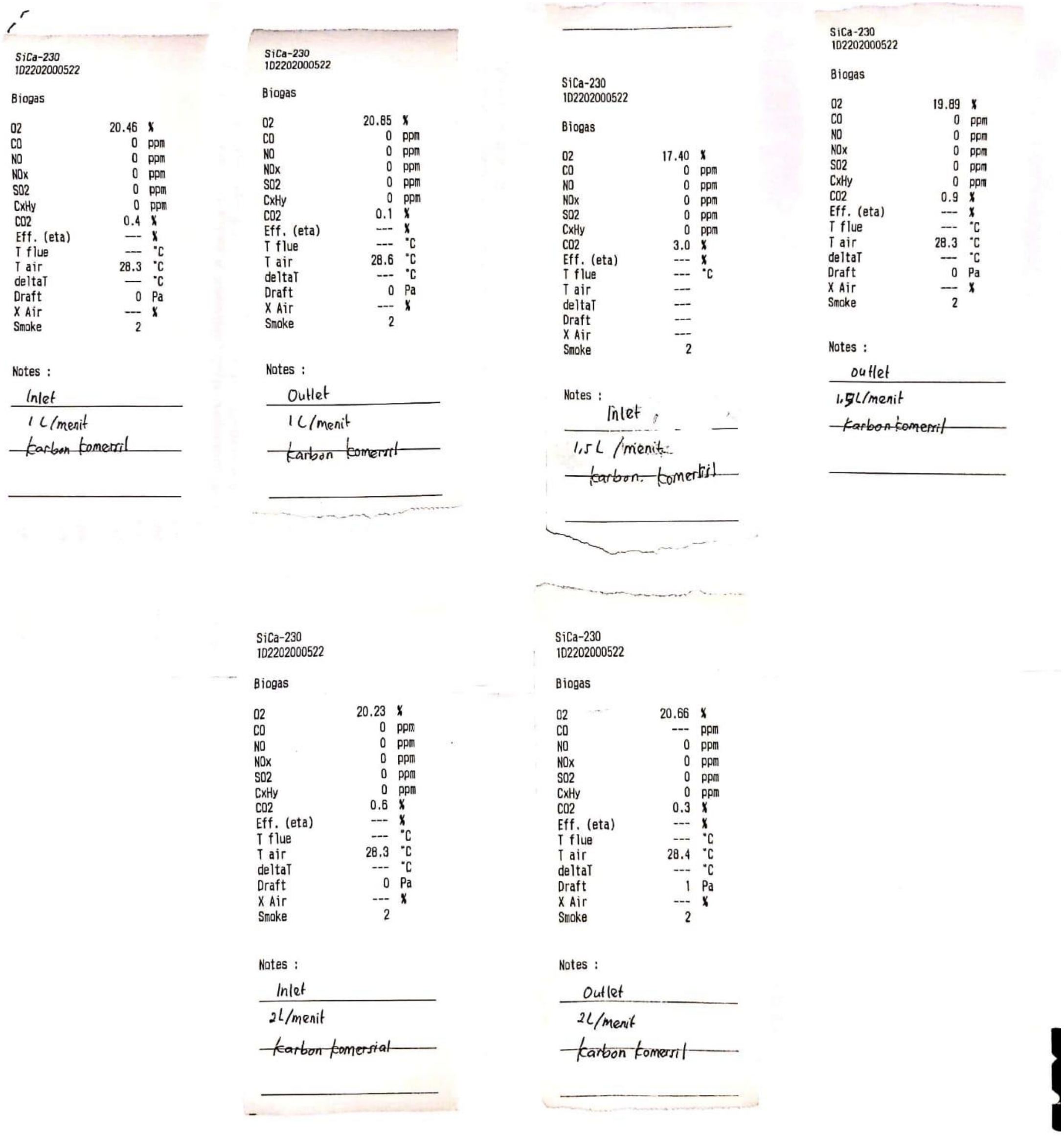
SiCa-230
1D2202000522

Biogas

| | | |
|---|---|---|
| O2 | 20.90 | % |
| CO | 0 | 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 | 0 | Pa |
| X Air | --- | % |
| Smoke | 2 | |

Notes :
Outlet
2 L/menit
karbon aktif pelepah
nipah 3M 100 mesh

## 2. Hasil penjerapan gas $CO_2$ menggunakan karbon aktif komersial



SiCa-230
1D2202000522

Biogas

| | | |
|---|---|---|
| O2 | 20.46 | % |
| CO | 0 | ppm |
| NO | 0 | ppm |
| NOx | 0 | ppm |
| SO2 | 0 | ppm |
| CxHy | 0 | ppm |
| CO2 | 0.4 | % |
| Eff. (eta) | --- | % |
| T flue | --- | °C |
| T air | 28.3 | °C |
| deltaT | --- | °C |
| Draft | 0 | Pa |
| X Air | --- | % |
| Smoke | 2 | |

Notes :
Inlet
1 L/menit
karbon komersil

SiCa-230
1D2202000522

Biogas

| | | |
|---|---|---|
| O2 | 20.85 | % |
| CO | 0 | ppm |
| NO | 0 | ppm |
| NOx | 0 | ppm |
| SO2 | 0 | ppm |
| CxHy | 0 | ppm |
| CO2 | 0.1 | % |
| Eff. (eta) | --- | % |
| T flue | --- | °C |
| T air | 28.6 | °C |
| deltaT | --- | °C |
| Draft | 0 | Pa |
| X Air | --- | % |
| Smoke | 2 | |

Notes :
Outlet
1 L/menit
karbon komersil

SiCa-230
1D2202000522

Biogas

| | | |
|---|---|---|
| O2 | 17.40 | % |
| CO | 0 | ppm |
| NO | 0 | ppm |
| NOx | 0 | ppm |
| SO2 | 0 | ppm |
| CxHy | 0 | ppm |
| CO2 | 3.0 | % |
| Eff. (eta) | --- | % |
| T flue | --- | °C |
| T air | --- | |
| deltaT | --- | |
| Draft | --- | |
| X Air | --- | |
| Smoke | 2 | |

Notes :
Inlet
1,5 L /menit
karbon komersil

SiCa-230
1D2202000522

Biogas

| | | |
|---|---|---|
| O2 | 19.89 | % |
| CO | 0 | ppm |
| NO | 0 | ppm |
| NOx | 0 | ppm |
| SO2 | 0 | ppm |
| CxHy | 0 | ppm |
| CO2 | 0.9 | % |
| Eff. (eta) | --- | % |
| T flue | --- | °C |
| T air | 28.3 | °C |
| deltaT | --- | °C |
| Draft | 0 | Pa |
| X Air | --- | % |
| Smoke | 2 | |

Notes :
outlet
1,5L/menit
karbon komersil

SiCa-230
1D2202000522

Biogas

| | | |
|---|---|---|
| O2 | 20.23 | % |
| CO | 0 | ppm |
| NO | 0 | ppm |
| NOx | 0 | ppm |
| SO2 | 0 | ppm |
| CxHy | 0 | ppm |
| CO2 | 0.6 | % |
| Eff. (eta) | --- | % |
| T flue | --- | °C |
| T air | 28.3 | °C |
| deltaT | --- | °C |
| Draft | 0 | Pa |
| X Air | --- | % |
| Smoke | 2 | |

Notes :
Inlet
2L/menit
karbon komersial

SiCa-230
1D2202000522

Biogas

| | | |
|---|---|---|
| O2 | 20.66 | % |
| CO | --- | ppm |
| NO | 0 | ppm |
| NOx | 0 | ppm |
| SO2 | 0 | ppm |
| CxHy | 0 | ppm |
| CO2 | 0.3 | % |
| Eff. (eta) | --- | % |
| T flue | --- | °C |
| T air | 28.4 | °C |
| deltaT | --- | °C |
| Draft | 1 | Pa |
| X Air | --- | % |
| Smoke | 2 | |

Notes :
Outlet
2L/menit
karbon komersil

## BIODATA PENULIS

| | |
|---|---|
| Nama | : Nadia Rahma Nessa |
| Tempat dan Tanggal Lahir | : Cilacap, 27 Maret 2001 |
| Alamat | : Jalan Bisma, Perum Griya Jembar Lestari RT 03/RW20, Gumilir, Kecamatan Cilacap Utara, Jawa Tengah |
| Telepon | : 085741146335 |
| Email | : nadiarahmanessa@gmail.com |
| Hobi | : Menyanyi |
| Motto | : Mari mengusahakan, meski tidak mudah |

**Riwayat Pendidikan :**

| | | |
|---|---|---|
| 1. | SDN Kebonmanis 01 | : Tahun 2007 - 2013 |
| 2. | SMP Negeri 4 Cilacap | : Tahun 2013 - 2016 |
| 3. | SMA Negeri 2 Cilacap | : Tahun 2016 - 2019 |
| 4. | Politeknik Negeri Cilacap | : Tahun 2019 - 2023 |

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