

LAMPIRAN I



Proses Pengambilan Pelepah Nipah



Proses Pemisahan Daun Dan Pelepah Nipah



Proses Pembelahan Dan Pembelahan Nipah



Proses Pirolisis Pelepah Nipah

	
<p>Hasil Pirolisis (Karbonisasi)</p>	<p>Proses Pengayakkan dengan Ayakkan 100 Mesh</p>
	
<p>Proses Aktivasi dengan Asam Klorida (HCl)</p>	<p>Proses Perendaman</p>
	
<p>Proses Penetralan</p>	

LAMPIRAN II

% Kadar Air

Jenis Sampel	Berat Krus+Berat Sampel	Berat Sampel	Rata-rata hasil oven
C 1	24.0545	1.0000	24.0276
C 2	30.6052	1.0000	30.5457
AC HCl 1M 1	55.0861	1.0000	55.0407
AC HCl 1M 2	31.3661	1.0000	31.3210
AC HCl 5M 1	42.6794	1.0000	42.6794
AC HCl 5M 2	46.7157	1.0000	46.7157

% Kadar Air C

$$\begin{aligned}
 - C_1 &= \frac{W_1 - W_2}{W_0} \times 100\% \\
 &= \frac{24.0545 - 24.0276}{1.0000} \times 100\% \\
 &= 3\% \\
 - C_2 &= \frac{W_1 - W_2}{W_0} \times 100\% \\
 &= \frac{30.6052 - 30.5457}{1.0000} \times 100\% \\
 &= 6\% \\
 - \text{Rata-rata \% Kadar Air C} &= \frac{3\% + 6\%}{2} = 4,5\%
 \end{aligned}$$

% Kadar Air AC HCl 1M

$$\begin{aligned}
 - \text{AC HCl 1M}_1 &= \frac{W_1 - W_2}{W_0} \times 100\% \\
 &= \frac{55.0861 - 55.0407}{1.0000} \times 100\% \\
 &= 5\% \\
 - \text{AC HCl 1M}_2 &= \frac{W_1 - W_2}{W_0} \times 100\% \\
 &= \frac{31.3661 - 31.3209}{1.0000} \times 100\% \\
 &= 5\% \\
 - \text{Rata-rata \% Kadar Air AC HCl 1M} &= \frac{5\% + 5\%}{2} = 5\%
 \end{aligned}$$

% Kadar Air AC HCl 5M

$$\begin{aligned}
 - \text{AC HCl 5M}_1 &= \frac{W_1 - W_2}{W_0} \times 100\% \\
 &= \frac{42.6794 - 42.6287}{1.0000} \times 100\% \\
 &= 5\% \\
 - \text{AC HCl 5M}_2 &= \frac{W_1 - W_2}{W_0} \times 100\%
 \end{aligned}$$

$$= \frac{46.7157 - 46.6662}{1.0000} \times 100\%$$

$$= 5\%$$

$$\text{- Rata-rata \% Kadar Air Tanpa AC} = \frac{5\% + 5\%}{2} = 5\%$$

% Kadar Abu

Jenis Sampel	Berat Krus	Berat Sampel	Hasil Akhir
C 1	45.8974	2.0000	45.9987
C 2	30.2731	2.0000	30.5661
AC HCl 1M 1	46.1206	2.0000	46.4873
AC HCl 1M 2	29.6746	2.0000	29.7782
AC HCl 5M 1	45.7288	2.0000	45.9246
AC HCl 5M 2	45.6716	2.0000	45.8835

% Kadar Abu C

$$\text{- } C_1 = \frac{W_2 - W_1}{W_0} \times 100\%$$

$$= \frac{45.9987 - 45.8974}{2.0000} \times 100\%$$

$$= 5\%$$

$$\text{- } C_2 = \frac{W_2 - W_1}{W_0} \times 100\%$$

$$= \frac{30.5661 - 30.2731}{2.0000} \times 100\%$$

$$= 15\%$$

$$\text{- Rata-rata \% Kadar Abu C} = \frac{5\% + 15\%}{2} = 10\%$$

% Kadar Abu AC HCl 1M

$$\text{- AC HCl 1M}_1 = \frac{W_2 - W_1}{W_0} \times 100\%$$

$$= \frac{46.4873 - 46.1206}{2.0000} \times 100\%$$

$$= 18\%$$

$$\text{- AC HCl 1M}_2 = \frac{W_2 - W_1}{W_0} \times 100\%$$

$$= \frac{29.7782 - 29.6746}{2.0000} \times 100\%$$

$$= 5\%$$

$$\text{- Rata-rata \% Kadar Abu AC HCl 1M} = \frac{18\% + 5\%}{2} = 12\%$$

% Kadar Abu AC HCl 5M

- AC HCl 5M₁ = $\frac{W_2 - W_1}{W_0} \times 100\%$
 = $\frac{45.9246 - 45.7288}{2.0000} \times 100\%$
 = 9%
- AC HCl 5M₂ = $\frac{W_2 - W_1}{W_0} \times 100\%$
 = $\frac{45.8835 - 45.6716}{2.0000} \times 100\%$
 = 11%
- Rata-rata % Kadar Abu AC HCl 5 M = $\frac{9\% + 11\%}{2} = 10\%$

% Bagian yang hilang pada pemanasan 950°C

Jenis Sampel	Berat Krus	Berat Sampel	Hasil Akhir
C 1	45.6205	1.0000	45.8933
C 2	45.6150	1.0000	45.9071
AC HCl 1M 1	46.4657	1.0000	46.5699
AC HCl 1M 2	46.5661	1.0000	46.6240
AC HCl 5M 1	57.1864	1.0000	57.3955
AC HCl 5M 2	57.2040	1.0000	57.3623

% Bagian yang hilang pada pemanasan 950°C C

- C₁ = $\frac{W_2 - W_1}{W_0} \times 100\%$
 = $\frac{45.8933 - 45.6205}{1.0000} \times 100\%$
 = 27%
- C₂ = $\frac{W_2 - W_1}{W_0} \times 100\%$
 = $\frac{45.9071 - 45.62150}{1.0000} \times 100\%$
 = 29%
- Rata-rata % Bagian yang hilang pada pemanasan 950°C C = $\frac{27\% + 29\%}{2} = 28\%$

% Bagian yang hilang pada pemanasan 950°C AC HCl 1M

- AC HCl 1M₁ = $\frac{W_2 - W_1}{W_0} \times 100\%$
 = $\frac{46.5699 - 46.4657}{1.0000} \times 100\%$
 = 10%

$$\begin{aligned}
 - \text{AC HCl 1M}_2 &= \frac{W_2 - W_1}{W_0} \times 100\% \\
 &= \frac{46.6240 - 46.5661}{1.0000} \times 100\% \\
 &= 6\%
 \end{aligned}$$

$$\begin{aligned}
 - \text{Rata-rata \% Bagian yang hilang pada pemanasan } 950^\circ\text{C AC HCl 1M} &= \\
 \frac{10\% + 6\%}{2} &= 8\%
 \end{aligned}$$

% Bagian yang hilang pada pemanasan 950°C AC HCl 5M

$$\begin{aligned}
 - \text{AC HCl 5M}_1 &= \frac{W_2 - W_1}{W_0} \times 100\% \\
 &= \frac{57.3955 - 57.1864}{1.0000} \times 100\% \\
 &= 21\%
 \end{aligned}$$

$$\begin{aligned}
 - \text{AC HCl 5M}_2 &= \frac{W_2 - W_1}{W_0} \times 100\% \\
 &= \frac{57.3623 - 57.2040}{1.0000} \times 100\% \\
 &= 16\%
 \end{aligned}$$

$$\begin{aligned}
 - \text{Rata-rata \% Bagian yang hilang pada pemanasan } 950^\circ\text{C AC HCl 5M} &= \\
 \frac{21\% + 16\%}{2} &= 18.5\%
 \end{aligned}$$

% Karbon Aktif Murni = 100% - (A+B)

Jenis Sampel	Bagian yang hilang pada pemanasan 950°C	Kadar Abu
C 1	27%	5%
C 2	29%	15%
AC HCl 1M 1	10%	18%
AC HCl 1M 2	6%	5%
AC HCl 5M 1	21%	10%
AC HCl 5M 2	16%	11%

% Karbon Aktif Murni C

$$\begin{aligned}
 - C_1 &= 100\% - (A+B) \\
 &= 100\% - (27\% + 5\%) \\
 &= 68\%
 \end{aligned}$$

$$\begin{aligned}
 - C_2 &= 100\% - (A+B)
 \end{aligned}$$

$$= 100\% - (29\% + 15\%)$$

$$= 56\%$$

$$\text{- Rata-rata \% Karbon Aktif Murni AC} = \frac{68\%+56\%}{2} = 62\%$$

% Karbon Aktif Murni AC HCl 1M

$$\begin{aligned} \text{- AC HCl 1M}_1 &= 100\% - (A+B) \\ &= 100\% - (10\% + 18\%) \\ &= 72\% \end{aligned}$$

$$\begin{aligned} \text{- AC HCl 1M}_2 &= 100\% - (A+B) \\ &= 100\% - (6\% + 5\%) \\ &= 89\% \end{aligned}$$

$$\text{- Rata-rata \% Karbon Aktif Murni AC HCl 1M} = \frac{72\%+89\%}{2} = 81\%$$

% Karbon Aktif Murni AC HCl 5M

$$\begin{aligned} \text{- AC HCl 5M}_1 &= 100\% - (A+B) \\ &= 100\% - (21\% + 10\%) \\ &= 69\% \end{aligned}$$

$$\begin{aligned} \text{- AC HCl 5M}_2 &= 100\% - (A+B) \\ &= 100\% - (16\% + 11\%) \\ &= 73\% \end{aligned}$$

$$\text{- Rata-rata \% Karbon Aktif Murni AC HCl 5M} = \frac{69\%+73\%}{2} = 71\%$$

% Daya serap terhadap Iodin

Jenis Sampel	Sebelum ditambahkan larutan Amylum	Sesudah ditambahkan larutan amyllum
C 1	7.2	8.1
C 2	5.6	6.5
AC HCl 1M 1	4.5	7.0
AC HCl 1M 2	2.0	5.9
AC HCl 5M 1	4.3	5.5
AC HCl 5M 2	4.3	5.4

% Daya serap terhadap Iodin C

$$\begin{aligned}
 - C_1 &= \frac{(10 - \frac{vxn}{0.1})}{W} \times 12.69 \times 5 \\
 &= \frac{(10 - \frac{8.1 \times 0.1}{0.1})}{0.5} \times 12.69 \times 5 \\
 &= \frac{1.9}{0.5} \times 12.69 \times 5 \\
 &= 241.11 \text{ mg/g}
 \end{aligned}$$

$$\begin{aligned}
 - C_2 &= \frac{(10 - \frac{vxn}{0.1})}{W} \times 12.69 \times 5 \\
 &= \frac{(10 - \frac{6.5 \times 0.1}{0.1})}{0.5} \times 12.69 \times 5 \\
 &= \frac{3.5}{0.5} \times 12.69 \times 5 \\
 &= 444.15 \text{ mg/g}
 \end{aligned}$$

$$\begin{aligned}
 - \text{Rata-rata \% Daya serap terhadap Iodin C} &= \frac{241.11 \text{ mg/g} + 444.15 \text{ mg/g}}{2} = \\
 &342.63 \text{ mg/g}
 \end{aligned}$$

% Daya serap terhadap Iodin AC HCl 1M

$$\begin{aligned}
 - \text{AC HCl 1M}_1 &= \frac{(10 - \frac{vxn}{0.1})}{W} \times 12.69 \times 5 \\
 &= \frac{(10 - \frac{7.0 \times 0.1}{0.1})}{0.5} \times 12.69 \times 5 \\
 &= \frac{3.0}{0.5} \times 12.69 \times 5^* \\
 &= 380.7 \text{ mg/g}
 \end{aligned}$$

$$\begin{aligned}
 - \text{AC HCl } 1M_2 &= \frac{(10 - \frac{vxn}{0.1})}{W} \times 12.69 \times 5 \\
 &= \frac{(10 - \frac{5.9 \times 0.1}{0.1})}{0.5} \times 12.69 \times 5 \\
 &= \frac{14.1}{0.5} \times 12.69 \times 5 \\
 &= 520.29 \text{ mg/g}
 \end{aligned}$$

$$\begin{aligned}
 - \text{Rata-rata \% Daya serap terhadap Iodin AC HCl } 1M &= \frac{380.7 + 520.29}{2} = \\
 &450.495 \text{ mg/g}
 \end{aligned}$$

% Daya serap terhadap Iodin AC HCl 5M

$$\begin{aligned}
 - \text{AC HCl } 5M_1 &= \frac{(10 - \frac{vxn}{0.1})}{W} \times 12.69 \times 5 \\
 &= \frac{(10 - \frac{5.5 \times 0.1}{0.1})}{0.5} \times 12.69 \times 5 \\
 &= \frac{4.5}{0.5} \times 12.69 \times 5 \\
 &= 571.05 \text{ mg/g}
 \end{aligned}$$

$$\begin{aligned}
 - \text{AC HCl } 5M_2 &= \frac{(10 - \frac{vxn}{0.1})}{W} \times 12.69 \times 5 \\
 &= \frac{(10 - \frac{5.4 \times 0.1}{0.1})}{0.5} \times 12.69 \times 5 \\
 &= \frac{4.6}{0.5} \times 12.69 \times 5 \\
 &= 583.74 \text{ mg/g}
 \end{aligned}$$

$$\text{Rata-rata \% Daya serap terhadap Iodin AC HCl } 5M = \frac{571.06 + 583.74}{2} = 577.395 \text{ mg/g}$$

-Uji Efektivitas Penurunan Konsentrasi Gas Amonia (NH₃) Berdasarkan Jenis Karbon

Karbon tidak teraktivasi (C)

$$\% \text{ Efektivitas} = \frac{43.13 \text{ ppm} - 0.00 \text{ ppm}}{43.13 \text{ ppm}} \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_1 = \left(\frac{43.13 - 0.00}{43.13} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_2 = \left(\frac{40.96 - 0.00}{40.96} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_3 = \left(\frac{37.05 - 0.00}{37.05} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_4 = \left(\frac{29.98 - 0.00}{29.98} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_5 = \left(\frac{28.81 - 0.00}{28.81} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_6 = \left(\frac{24.36 - 0.00}{24.36} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_7 = \left(\frac{22.21 - 0.00}{22.21} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_8 = \left(\frac{21.85 - 0.00}{21.85} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_9 = \left(\frac{20.42 - 0.00}{20.42} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_{10} = \left(\frac{19.20 - 0.00}{19.20} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_{11} = \left(\frac{16.83 - 0.00}{16.83} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_{12} = \left(\frac{16.25 - 0.00}{16.25} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_{13} = \left(\frac{15.26 - 0.00}{15.26} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_{14} = \left(\frac{14.12 - 0.00}{14.12} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_{15} = \left(\frac{12.17 - 0.00}{12.17} \right) \times 100\% = 100\%$$

Karbon teraktivasi asam klorida (AC HCl) 1 M

$$\% \text{ Efektivitas}_1 = \left(\frac{41.43 - 0.00}{41.43} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_2 = \left(\frac{31.87 - 0.00}{31.87} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_3 = \left(\frac{24.77 - 0.00}{24.77} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_4 = \left(\frac{20.15 - 0.00}{20.15} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_5 = \left(\frac{17.96 - 0.00}{17.96} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 6 = \left(\frac{15.97-0.00}{15.97} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 7 = \left(\frac{14.12-0.00}{14.12} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 8 = \left(\frac{14.47-0.00}{14.47} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 9 = \left(\frac{13.49-0.00}{13.49} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 10 = \left(\frac{12.91-0.00}{12.91} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 11 = \left(\frac{12.34-0.00}{12.34} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 12 = \left(\frac{12.09-0.00}{12.09} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 13 = \left(\frac{11.23-0.00}{11.23} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 14 = \left(\frac{11.32-0.00}{11.32} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 15 = \left(\frac{10.50-0.00}{10.50} \right) \times 100\% = 100\%$$

Karbon teraktivasi asam klorida (AC HCl) 5 M

$$\% \text{ Efektivitas } 1 = \left(\frac{31.61-0.00}{31.61} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 2 = \left(\frac{27.29-0.00}{27.29} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 3 = \left(\frac{25.17-0.00}{25.17} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 4 = \left(\frac{22.20-0.00}{292.20} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 5 = \left(\frac{17.43-0.00}{17.43} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 6 = \left(\frac{14.37-0.00}{14.37} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 7 = \left(\frac{13.41-0.00}{13.41} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 8 = \left(\frac{11.67-0.00}{11.67} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 9 = \left(\frac{11.44-0.00}{11.44} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 10 = \left(\frac{11.47-0.00}{11.47} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 11 = \left(\frac{10.20-0.00}{10.20} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas } 12 = \left(\frac{11.12-0.00}{11.12} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_{13} = \left(\frac{10.67 - 0.00}{10.67} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_{14} = \left(\frac{9.84 - 0.00}{9.84} \right) \times 100\% = 100\%$$

$$\% \text{ Efektivitas}_{15} = \left(\frac{9.79 - 0.00}{9.79} \right) \times 100\% = 100\%$$

