LAMPIRAN 1

DOKUMENTASI PENELITIAN

<table>
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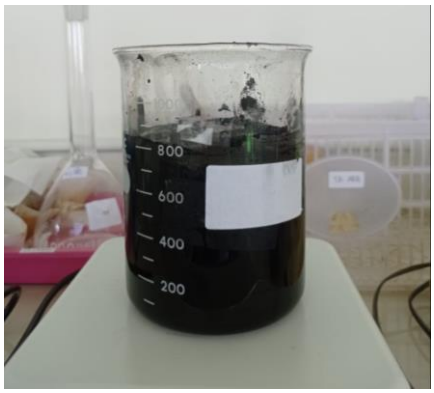
<tr><td>  </td><td>  </td></tr>
<tr><td>Proses pembuatan larutan H_3PO_4</td><td>Proses aktivasi kimia dengan H_3PO_4</td></tr>
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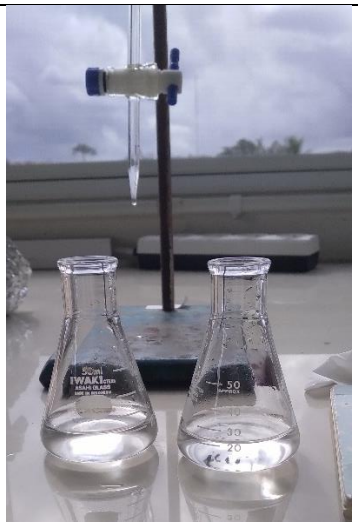
Proses penyaringan menggunakan kertas saring	Pengeringan untuk karbon aktif pada suhu 105°C
	
Uji kadar air	Uji kadar abu menggunakan furnace

	
Pengadukan sampel dengan *magnetic stirrer* untuk uji daya serap iodin	Proses titrasi untuk pengujian daya serap iodin
	
Kolom filter untuk penjerapan gas CO	Alat penjerap gas CO
	
Pengisian karbon aktif ke dalam kolom filter	Penjerapan Gas CO sampel K_2M_{100}

	
Penjerapan Gas CO sampel K_2M_{50}	Penjerapan Gas CO sampel K_3M_{50}
	
Penjerapan Gas CO sampel K_0M_{100}	Penjerapan Gas CO sampel K_3M_{100}
	
Penjerapan Gas CO sampel K_2M_{50}	

LAMPIRAN 2

PERHITUNGAN UJI KARAKTERISTIK KARBON AKTIF

1. **Kadar Air**

$$Kadar\ air\ (\%) = \frac{w1}{w2} x\ 100$$

Keterangan :

W1 : Kehilangan Bobot (gram)

W2 : Bobot Contoh (gram)

a. Sampel K_0M_{50}

W1 = 0,02 gr

W2 = 1 gr

$$Kadar\ air\ (\%) = \frac{w1}{w2} x\ 100$$

$$Kadar\ air\ (\%) = \frac{0{,}02}{1} x\ 100$$

$$Kadar\ air\ (\%) = 2$$

b. Sampel K_0M_{100}

W1 = 0,01 gr

W2 = 1 gr

$$Kadar\ air\ (\%) = \frac{w1}{w2} x\ 100$$

$$Kadar\ air\ (\%) = \frac{0{,}01}{1} x\ 100$$

$$Kadar\ air\ (\%) = 1$$

c. Sampel K_2M_{50}

W1 = 0,03 gr

W2 = 1 gr

$$Kadar\ air\ (\%) = \frac{w1}{w2} x\ 100$$

$$Kadar\ air\ (\%) = \frac{0{,}03}{1} x\ 100$$

$$Kadar\ air\ (\%) =$$

d. Sampel K_3M_{50}

W1 = 0,03 gr

W2 = 1 gr

$$Kadar\ air\ (\%) = \frac{w1}{w2} x\ 100$$

$$Kadar\ air\ (\%) = \frac{0{,}03}{1} x\ 100$$

$$Kadar\ air\ (\%) = 3$$

e. Sampel K_2M_{100}

W1 = 0,02 gr

W2 = 1 gr

$$Kadar\ air\ (\%) = \frac{w1}{w2} x\ 100$$

$$Kadar\ air\ (\%) = \frac{0{,}02}{1} x\ 100$$

$$Kadar\ air\ (\%) = 2$$

f. Sampel K_3M_{100}

W1 = 0,04 gr

W2 = 1 gr

$$Kadar\ air\ (\%) = \frac{w1}{w2} x\ 100$$

$$Kadar\ air\ (\%) = \frac{0{,}04}{1} x\ 100$$

$$Kadar\ air\ (\%) = 4$$

2. Kadar Abu

$$Kadar\ abu\ (\%) = \frac{w1}{w2} x\ 100$$

Keterangan :

W1 : Sisa Pijar (gram)

W2 : Bobot Contoh (gram)

a. Sampel K_0M_{50}

W1 = 0,05 gr

W2 = 2 gr

$$Kadar\ air\ (\%) = \frac{w1}{w2} x\ 100$$

$$Kadar\ air\ (\%) = \frac{0{,}05}{2} x\ 100$$

$$Kadar\ air\ (\%) = 2{,}5$$

b. Sampel K_0M_{100}

W1 = 0,05 gr

W2 = 2 gr

$$Kadar\ air\ (\%) = \frac{w1}{w2} x\ 100$$

$$Kadar\ air\ (\%) = \frac{0{,}0025}{2} x\ 100$$

$$Kadar\ air\ (\%) = 2{,}5$$

c. Sampel K_2M_{50}

W1 = 0,05 gr

W2 = 2 gr

$$Kadar\ air\ (\%) = \frac{w1}{w2} x\ 100$$

$$Kadar\ air\ (\%) = \frac{0{,}025}{2} x\ 100$$

$$Kadar\ air\ (\%) = 2{,}5$$

d. Sampel K_3M_{50}

W1 = 0,04 gr

W2 = 2 gr

$$Kadar\ air\ (\%) = \frac{w1}{w2} x\ 100$$

$$Kadar\ air\ (\%) = \frac{0{,}02}{2} x\ 100$$

$$Kadar\ air\ (\%) = 2$$

e. Sampel K_2M_{100}

W1 = 0,07 gr

W2 = 2 gr

$$Kadar\ air\ (\%) = \frac{w1}{w2} x\ 100$$

$$Kadar\ air\ (\%) = \frac{0{,}035}{2} x\ 100$$

$$Kadar\ air\ (\%) = 3{,}5$$

f. Sampel K_3M_{100}

W1 = 0,04 gr

W2 = 2 gr

$$Kadar\ air\ (\%) = \frac{w1}{w2} x\ 100$$

$$Kadar\ air\ (\%) = \frac{0{,}02}{2} x\ 100$$

$$Kadar\ air\ (\%) = 2$$

3. Daya Serap Iodin

$$\text{I}\ mg/g = \frac{\left(10 - \frac{V\ X\ N}{0{,}1}\right)\ x\ 12{,}69\ x\ 5}{w}$$

Keterangan :

V = Larutan Natrium tio-sulfat yang diperlukan (ml)

N = Normalitas larutan natrum tio-sulfat

12,69 = Jumlah iodin sesuai dengan 1 ml larutan natrium tio-sulfat 0,1 N

w = Contoh (gram)

a. Sampel K_0M_{50}

V = 4 ml

N = 0,1 N

w = 0,5 gr

$$\text{I}\ mg/g = \frac{\left(10 - \frac{4\ x\ 0{,}1}{0{,}1}\right)\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{(10-4)\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{6\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{380{,}7}{0{,}5}$$

$$\text{I } = 761{,}4\ mg/g$$

b. Sampel K_0M_{100}

V = 4,1 ml

N = 0,1 N

w = 0,5 gr

$$\text{I } mg/g = \frac{\left(10 - \frac{4{,}1x\ 0{,}1}{0{,}1}\right)\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{(10-4{,}1)\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{5{,}9\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{374{,}35}{0{,}5}$$

$$\text{I } = 748{,}7\ mg/g$$

c. Sampel K_2M_{50}

V = 3,8 ml

N = 0,1 N

w = 0,5 gr

$$\text{I } mg/g = \frac{\left(10 - \frac{3{,}8\ x\ 0{,}1}{0{,}1}\right)\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{(10-3{,}8)\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{6{,}2\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{393{,}39}{0{,}5}$$

$$\text{I } = 786{,}78\ mg/g$$

d. Sampel K_3M_{50}

V = 3,75 ml

N = 0,1 N

w = 0,5 gr

$$\text{I } mg/g = \frac{\left(10 - \frac{3{,}6\ x\ 0{,}1}{0{,}1}\right)\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{(10 - 3{,}6)\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{6{,}4\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{406{,}08}{0{,}5}$$

$$\text{I } = 812{,}16\ mg/g$$

e. Sampel K_2M_{100}

V = 3,8 ml

N = 0,1 N

w = 0,5 gr

$$\text{I } mg/g = \frac{\left(10 - \frac{3{,}8\ x\ 0{,}1}{0{,}1}\right)\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{(10 - 4)\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{6{,}2\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{393{,}39}{0{,}5}$$

$$\text{I } = 789{,}78\ mg/g$$

f. Sampel K_3M_{100}

V = 3,5 ml

N = 0,1 N

w = 0,5 gr

$$\text{I } mg/g = \frac{\left(10 - \frac{3{,}5\ x\ 0{,}1}{0{,}1}\right)\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{(10 - 3{,}5)\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{6{,}5\ x\ 12{,}69\ x\ 5}{0{,}5}$$

$$\text{I } mg/g = \frac{412{,}42}{0{,}5}$$

$$\text{I } = 824{,}84\ mg/g$$

LAMPIRAN 3

PERHITUNGAN PENJERAPAN GAS CO

Efektivitas Penjerapan Gas CO

$$R = \frac{Ca}{Ct}\ x\ 100$$

$$R = \frac{C\ in - C\ out}{C\ in}\ x\ 100$$

Keterangan,

R = Efektivitas penyerapan (%)

Ca = konsentrasi gas CO terjerap

Ct = konsentrasi gas CO total

C in = konsentrasi gas CO input

C out = konsentrasi gas CO output

Data Pengambilan Sampel Penjerapan Gas CO

Sampel	Konsentrasi Awal CO (ppm)	Konsentrasi Akhir CO (ppm)	Penurunan Konsentrasi CO (ppm)	Efektivitas (%)
K_0M_{50}	701,24	20,57	656,43	93,6%
K_0M_{100}	788,32	36,73	719	95,37%
K_3M_{50}	1351,9	58,0	1293,9	95,7%
K_2M_{50}	1254,0	30,16	1223,84	97,59%
K_3M_{100}	1015,5	14,88	1000,62	98,5%
K_2M_{100}	788,32	36,73	719	95,37%

a. K_0M_{50}

C in = 701,24 ppm

C out = 20,57 ppm

$R = \frac{Ca}{Ct}\ x\ 100\%$

$$R = \frac{C\ in - C\ out}{C\ in}\ x\ 100\%$$

$$R = \frac{701{,}24 - 20{,}57}{701{,}24}\ x\ 100\%$$

$$= \frac{656{,}43}{701{,}24}\ x\ 100\%$$

$$= 93{,}6\%$$

b. K_0M_{100}

C in = 788,32 ppm

C out = 36,73 ppm

$$R = \frac{Ca}{Ct}\ x\ 100\%$$

$$R = \frac{C\ in - C\ out}{C\ in}\ x\ 100\%$$

$$R = \frac{788{,}32 - 36{,}73}{788{,}32}\ x\ 100\%$$

$$= \frac{719}{788{,}32}\ x\ 100\%$$

$$= 95{,}37\%$$

c. K_2M_{50}

C in = 1254 ppm

C out = 30,16 ppm

$$R = \frac{Ca}{Ct}\ x\ 100\%$$

$$R = \frac{C\ in - C\ out}{C\ in}\ x\ 100\%$$

$$R = \frac{1254 - 30{,}16}{1254}\ x\ 100\%$$

$$= \frac{1223{,}84}{1254}\ x\ 100\%$$

$$= 97{,}59\%$$

d. K_3M_{50}

C in = 1351,9 ppm

C out = 58 ppm

$$R = \frac{Ca}{Ct}\ x\ 100\%$$

$$R = \frac{C\ in - C\ out}{C\ in}\ x\ 100\%$$

$$R = \frac{1351{,}9 - 58}{1351}\ x\ 100\%$$

$$= \frac{1293{,}9}{1351}\ x\ 100\%$$

$$= 95{,}59\%$$

e. K_2M_{100}

C in = 788,32 ppm

C out = 36,73 ppm

$$R = \frac{Ca}{Ct}\ x\ 100\%$$

$$R = \frac{C\ in - C\ out}{C\ in}\ x\ 100\%$$

$$R = \frac{788{,}32 - 36{,}73}{788{,}32}\ x\ 100\%$$

$$= \frac{719}{788{,}32}\ x\ 100\%$$

$$= 95{,}37\%$$

f. K_3M_{100}

C in = 1015,5 ppm

C out = 14,88 ppm

$$R = \frac{Ca}{Ct}\ x\ 100\%$$

$$R = \frac{C\ in - C\ out}{C\ in}\ x\ 100\%$$

$$R = \frac{1015{,}5 - 14{,}88}{1015{,}5}\ x\ 100\%$$

$$= \frac{1000{,}62}{1015{,}5}\ x\ 100\%$$

$$= 98{,}5\%$$