

## Lampiran 1. Perhitungan Data Hasil Penelitian

### A. Larutan Induk 300 ppm, 1L

$$\begin{aligned} 300 \text{ ppm} &= \frac{300 \text{ mg}}{1L} \\ &= 0,3 \text{ gr} \end{aligned}$$

### B. Larutan Standar 100 ppm

$$\begin{aligned} M1 \times V1 &= M2 \times V2 \\ 300 \text{ ppm} \times V1 &= 100 \text{ ppm} \times 100 \text{ ml} \\ V1 &= 33,33 \text{ ml} \end{aligned}$$

### C. Larutan Standar 10 ppm, 20 ppm, 30 ppm, 40 ppm, 50 ppm

#### a. 10 ppm

$$\begin{aligned} M1 \times V1 &= M2 \times V2 \\ 100 \text{ ppm} \times V1 &= 10 \text{ ppm} \times 10 \text{ ml} \\ V1 &= 1 \text{ ml} \end{aligned}$$

#### b. 20 ppm

$$\begin{aligned} M1 \times V1 &= M2 \times V2 \\ 100 \text{ ppm} \times V1 &= 20 \text{ ppm} \times 10 \text{ ml} \\ V1 &= 2 \text{ ml} \end{aligned}$$

#### c. 30 ppm

$$\begin{aligned} M1 \times V1 &= M2 \times V2 \\ 100 \text{ ppm} \times V1 &= 30 \text{ ppm} \times 10 \text{ ml} \\ V1 &= 3 \text{ ml} \end{aligned}$$

#### d. 40 ppm

$$\begin{aligned} M1 \times V1 &= M2 \times V2 \\ 100 \text{ ppm} \times V1 &= 40 \text{ ppm} \times 10 \text{ ml} \\ V1 &= 4 \text{ ml} \end{aligned}$$

#### e. 50 ppm

$$\begin{aligned} M1 \times V1 &= M2 \times V2 \\ 100 \text{ ppm} \times V1 &= 50 \text{ ppm} \times 10 \text{ ml} \\ V1 &= 5 \text{ ml} \end{aligned}$$

## D. Nilai Kapasitas Adsorpsi Variasi Massa Adsorben

$$\% = \frac{(C_0 - C_e)}{C_0} \times 100\%$$

Keterangan

$C_0$  = konsentrasi awal NY (mg/L)

$C_e$  = konsentrasi kesetimbangan NY (mg/L)

### 1. KAM H 1:1

#### 1.1 KAM 0,05 gram

$$\begin{aligned}\% &= \frac{(292,44 - 154,268)}{292,44} \times 100\% \\ &= 47\%\end{aligned}$$

#### 1.2 KAM 0,1 gram

$$\begin{aligned}\% &= \frac{(292,44 - 100,458)}{292,44} \times 100\% \\ &= 66\%\end{aligned}$$

#### 1.3 KAM 0,2 Gram

$$\begin{aligned}\% &= \frac{(292,44 - 89,784)}{292,44} \times 100\% \\ &= 69\%\end{aligned}$$

### 2. KAM H 1:2

#### 2.1 KAM 0,05 gram

$$\begin{aligned}\% &= \frac{(292,44 - 198,433)}{292,44} \times 100\% \\ &= 32\%\end{aligned}$$

#### 2.2 KAM 0,1 gram

$$\begin{aligned}\% &= \frac{(292,44 - 168,712)}{292,44} \times 100\% \\ &= 42\%\end{aligned}$$

#### 2.3 KAM 0,2 gram

$$\begin{aligned}\% &= \frac{(292,44 - 132,393)}{292,44} \times 100\% \\ &= 55\%\end{aligned}$$

### 3. KAM 1:1

#### 3.1 KAM 0,05 gram

$$\% = \frac{(292,44 - 201,304)}{292,44} \times 100\%$$

$$= 31\%$$

### 3.2 KAM 0,1 gram

$$\begin{aligned}\% &= \frac{(292,44-187,101)}{292,44} \times 100\% \\ &= 36\%\end{aligned}$$

### 3.3 KAM 0,2 gram

$$\begin{aligned}\% &= \frac{(292,44-146,092)}{292,44} \times 100\% \\ &= 50\%\end{aligned}$$

## 4. Nilai Kapasitas Adsorpsi Variasi Lama Waktu Kontak

$$\% = \frac{(C_0 - C_e)}{C_0} \times 100\%$$

Keterangan

$C_0$  = konsentrasi awal NY (mg/L)

$C_e$  = konsentrasi kesetimbangan NY (mg/L)

### 1. Lama Waktu Kontak 15 Menit

$$\begin{aligned}\% &= \frac{(292,44-100,108)}{292,44} \times 100\% \\ &= 65\%\end{aligned}$$

### 2. Lama Waktu Kontak 30 Menit

$$\begin{aligned}\% &= \frac{(292,44-63,471)}{292,44} \times 100\% \\ &= 78\%\end{aligned}$$

### 3. Lama Waktu Kontak 45 Menit

$$\begin{aligned}\% &= \frac{(292,44-58,31)}{292,44} \times 100\% \\ &= 80\%\end{aligned}$$

### 4. Lama Waktu Kontak 60 Menit

$$\begin{aligned}\% &= \frac{(292,44-44,743)}{292,44} \times 100\% \\ &= 85\%\end{aligned}$$

**Lampiran 2. Dokumentasi Penelitian**  
**Pembuatan Karbon Aktif Magnet (KAM) Non Hidrotermal**



Pengadukan 200 rpm KA suhu 70°C



Pengadukan Fe<sub>3</sub>O<sub>4</sub>



Penambahan NaOH



Penyaringan KAM



Pengovenan KAM



KAM 1:2

## Pembuatan Karbon Aktif Magnet (KAM) Proses Hidrotermal



Proses Hidrotermal Suhu 121°C Selama  
18 Jam



Penyaringan KAM



Proses Kalsinasi Suhu 250°C Selama 1  
Jam



KAM H 1:1



KAM H 1:2

**Zat Warna *Napthol Yellow* dan Limbah Batik Asli**



Larutan *Napthol Yellow* 300 ppm



Limbah Batik Asli

**Adsorpsi Zat Warna *Napthol Yellow* Dengan Variasi Massa Adsorben**



KAM H 1:1 0,05 gram



KAM H 1:1 0,1 gram



KAM H 1:1 0,2 gram



KAM H 1:2 0,05 gram



KAM H 1:2 0,1 gram



KAM H 1:2 0,2 gram



KAM 1:2 0,05 gram



KAM 1:2 0,1 gram



KAM 1:2 0,2 gram

**Adsorpsi Zat Warna *Naphthol Yellow* Dengan Variasi Lama Waktu Kontak**



### Hasil Adsorpsi Zat Warna Dengan Variasi Lama Waktu Kontak



Waktu Kontak 15 Menit



Waktu Kontak 30 Menit



Waktu Kontak 45 Menit



Waktu Kontak 60 Menit

### Hasil Uji Adsorpsi Limbah Asli

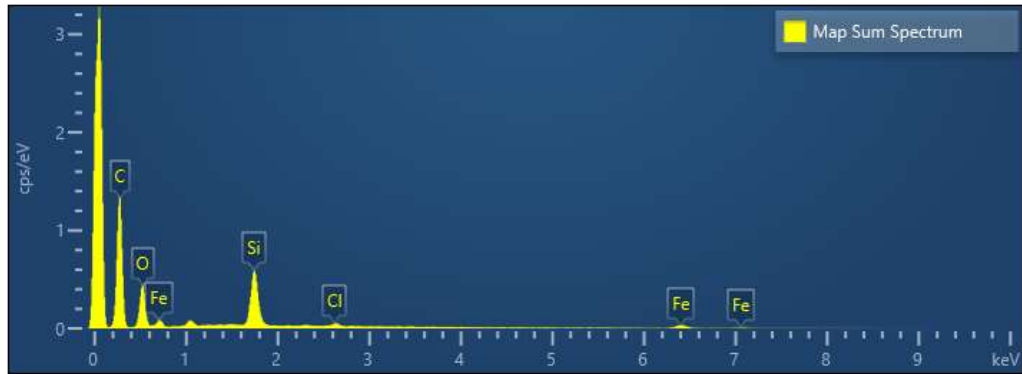


Hasil Uji Adsorpsi Limbah Artifisial dan Limbah Asli dengan 0,2 gram dan 2,3 gram KAM H 1:2 dan Waktu Kontak 60 Menit pada a) Limbah Artifisial NY 300 ppm, b) Limbah Artifisial setelah Adsorpsi, c) Limbah Asli sebelum

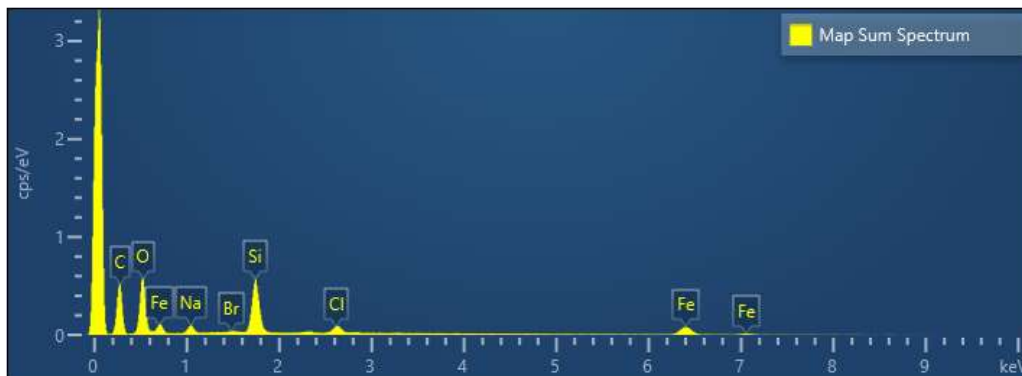


Asorpsi, d) Limbah Asli setelah Adsorpsi dengan Massa Adsorben 2,3 gram  
dan e) Limbah Asli setelah Adsorpsi dengan Massa Adsorben 2,3 gram

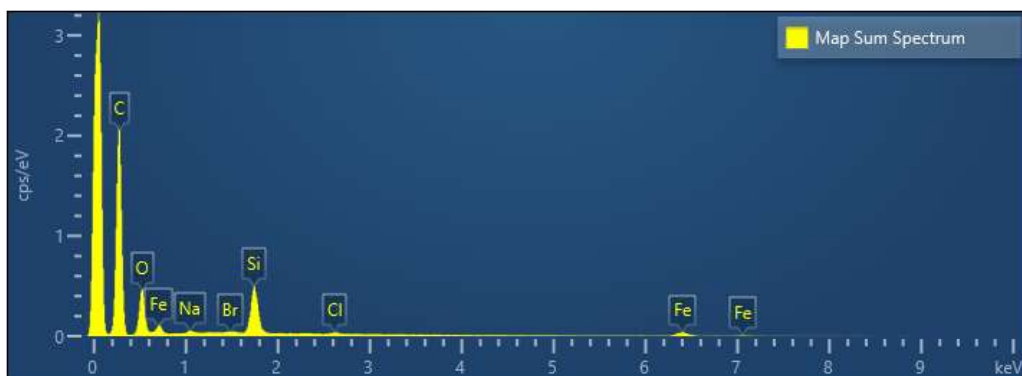
### Hasil Analisis SEM-EDX



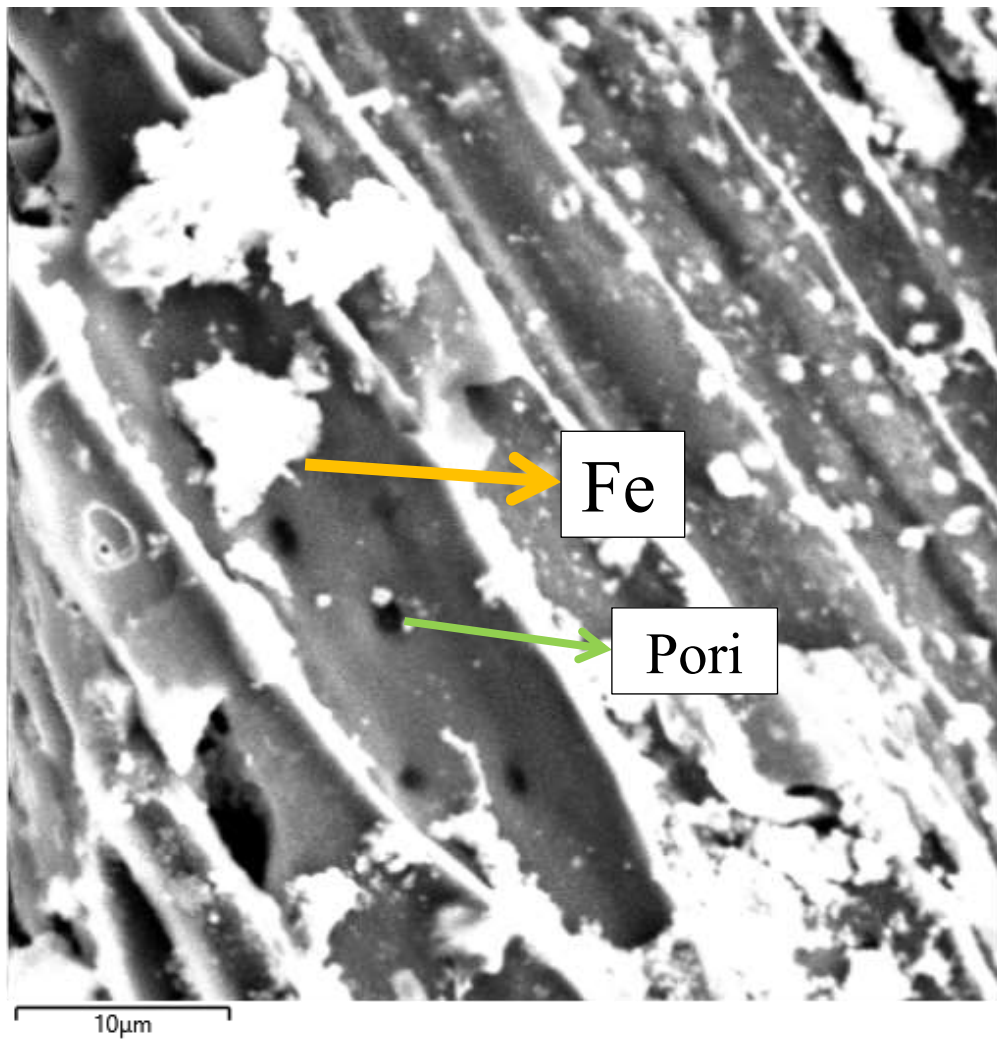
Hasil SEM-EDX KAM H 1:1



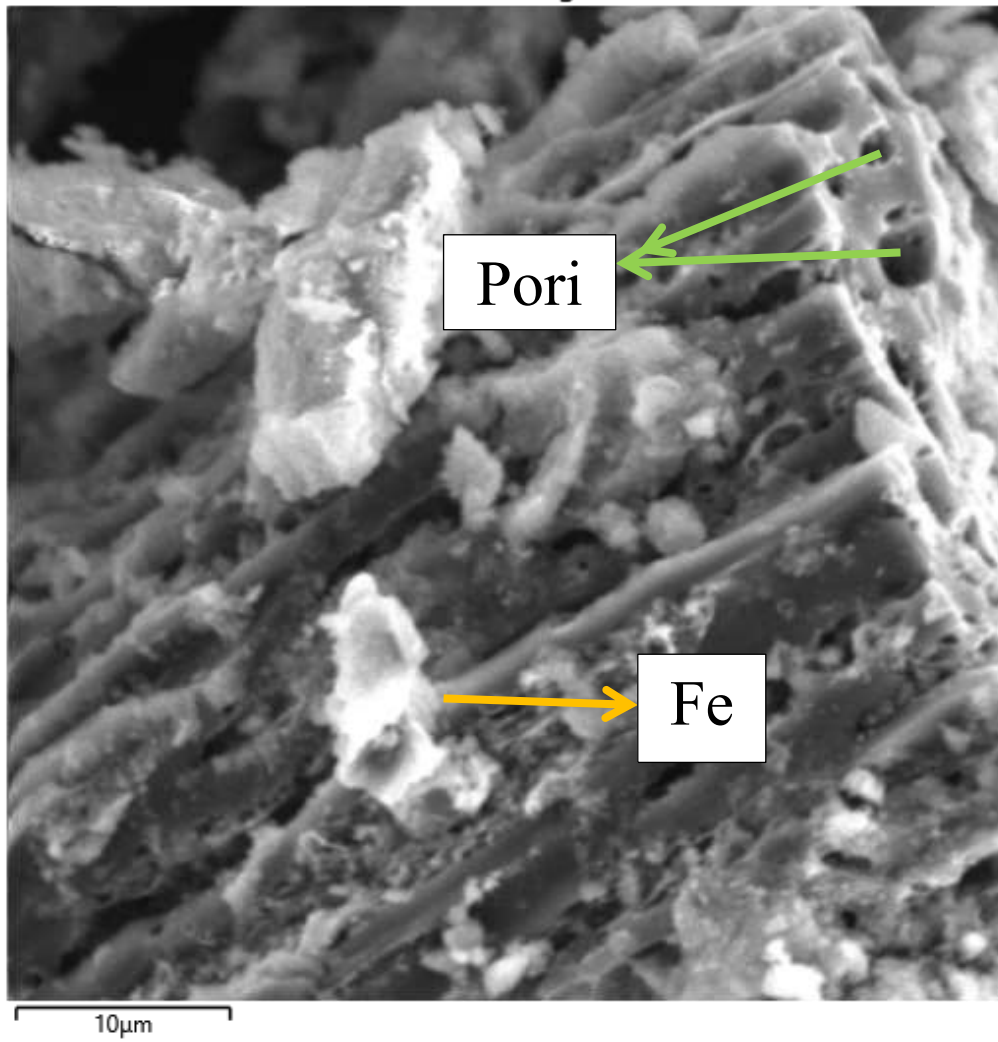
Hasil SEM-EDX KAM H 1:2



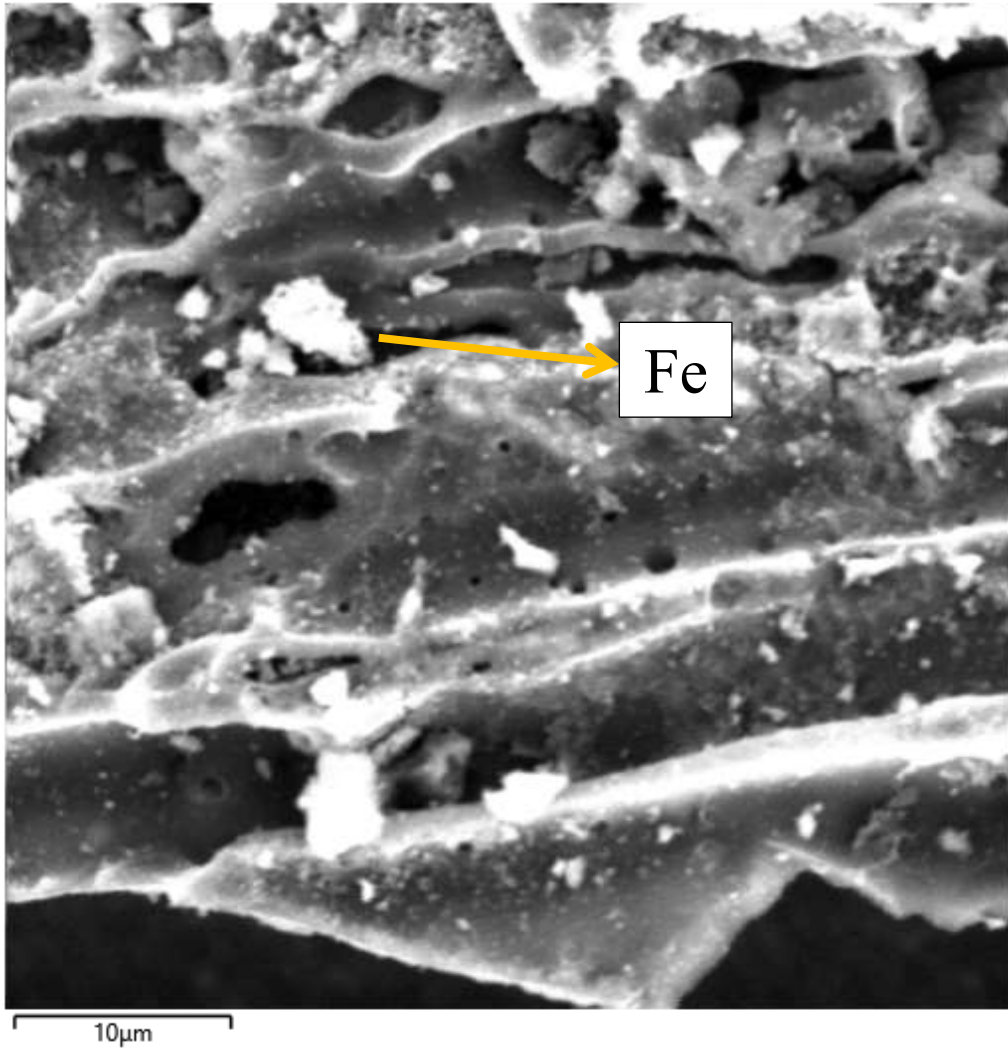
Hasil SEM-EDX KAM 1:1



Hasil SEM-EDX KAM H 1:1

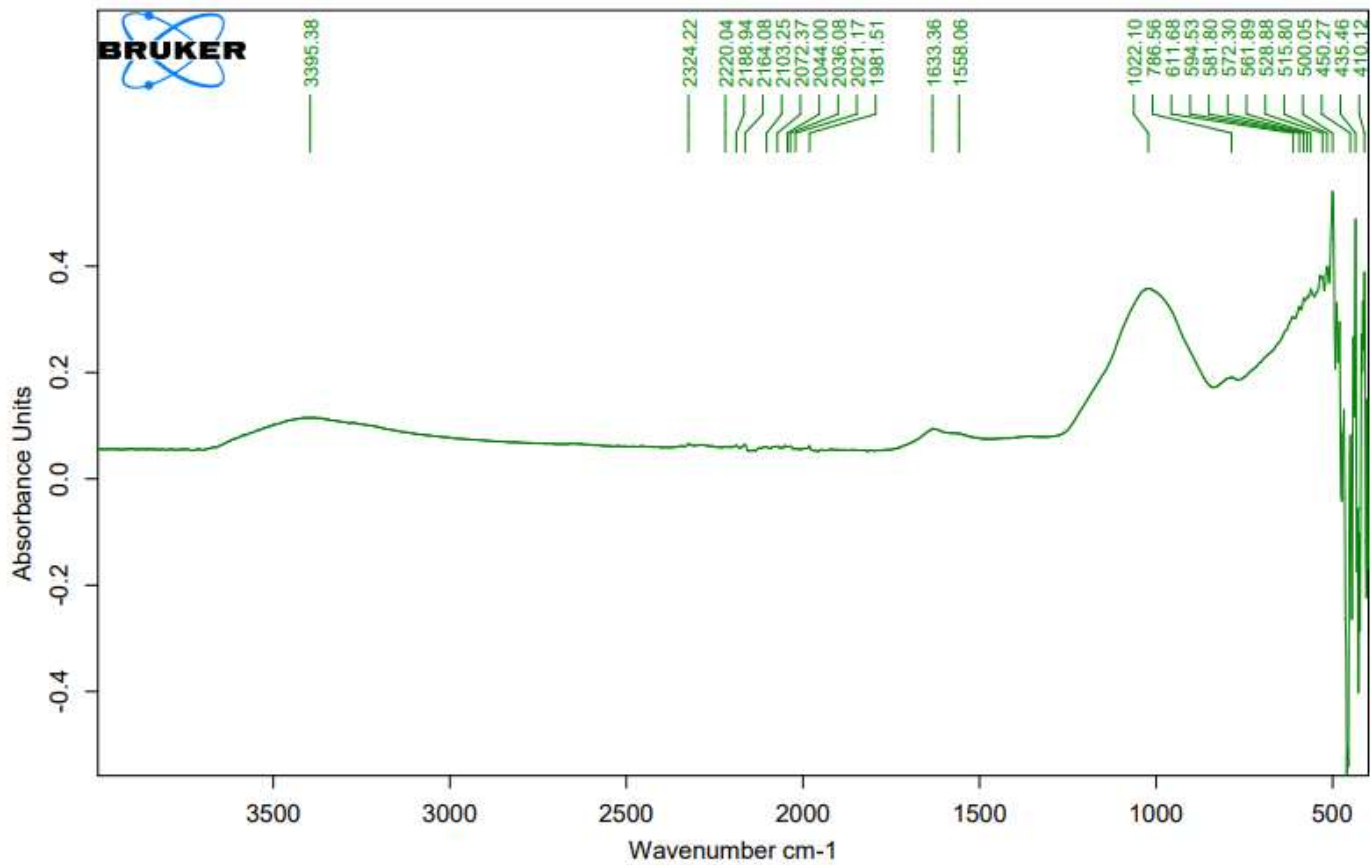


Hasil SEM-EDX KAM H 1:2

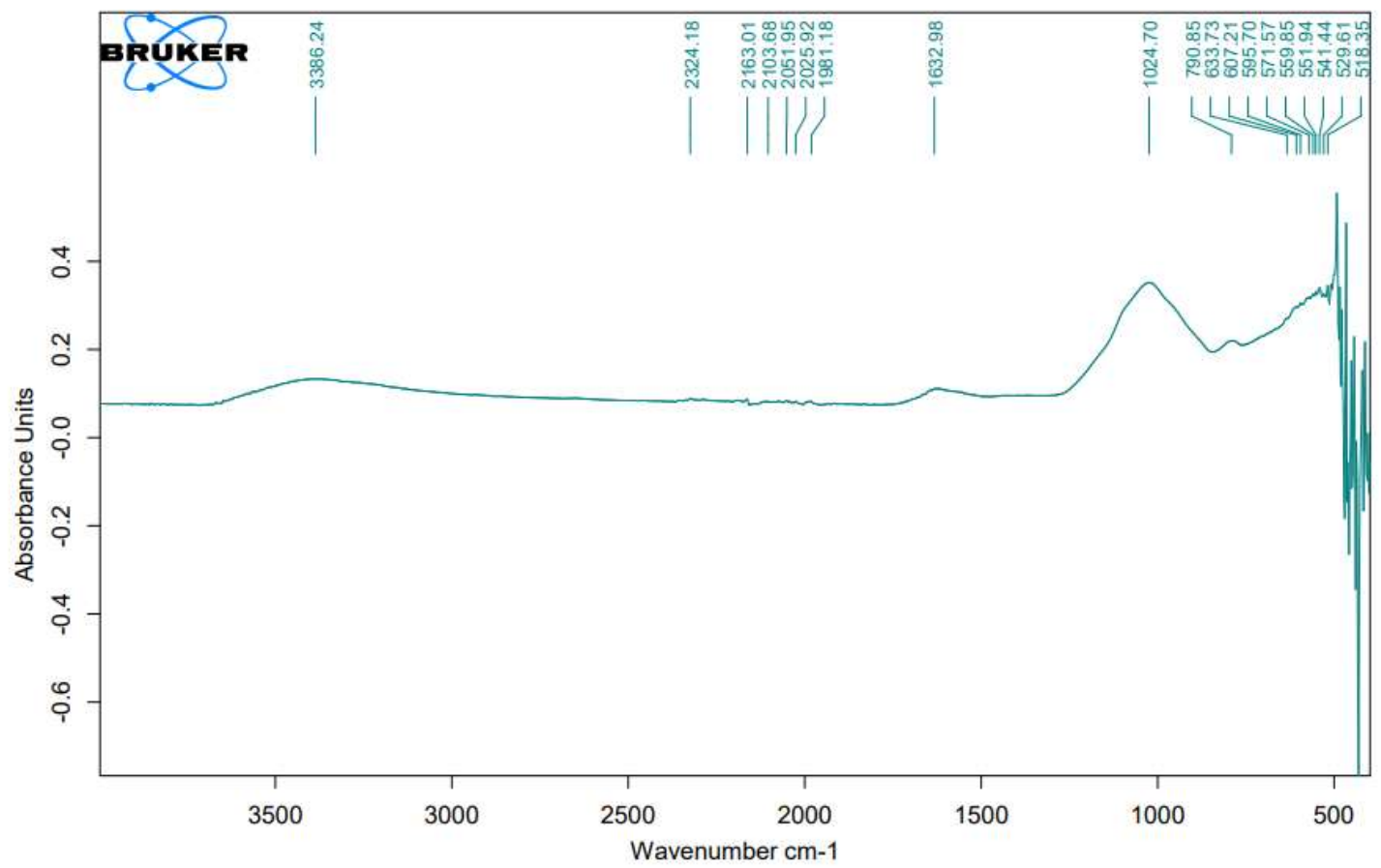


Hasil SEM-EDX KAM 1:2

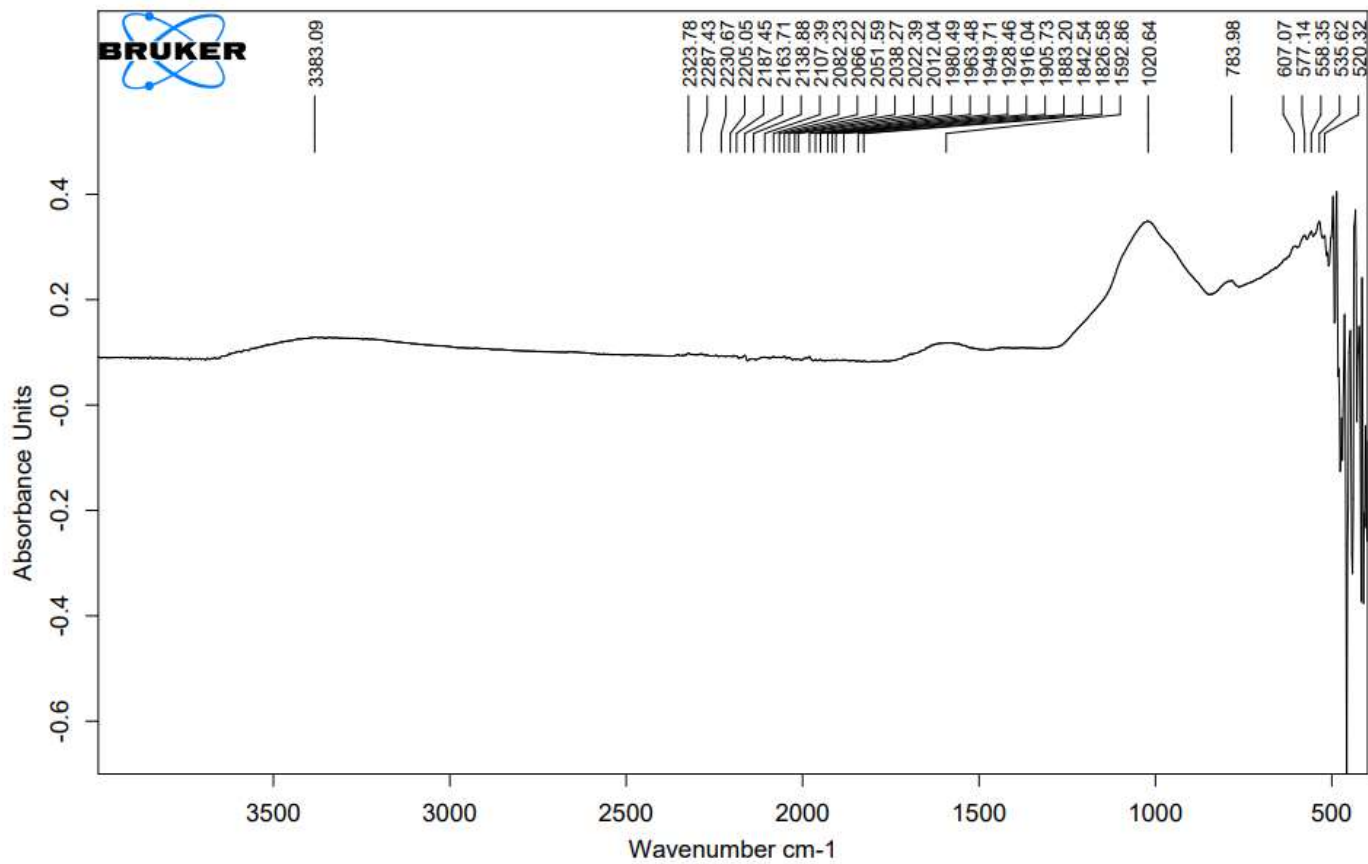
### Hasil Analisis Gugus Fungsi Menggunakan FTIR



KAM H 1:1



KAM H 1:2



KAM 1:2

## **Biodata Penulis**



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### **Riwayat Pendidikan :**

1. SD Negeri 1 Penaruban (2008 – 2014)
2. SMP Negeri 1 Bukateja (2014 – 2017)
3. SMA Negeri Bukateja (2017 – 2020)
4. Politeknik Negeri Cilacap (2020 – 20224)

### **Pengalaman Organisasi**

- Pengurus Badan Perwakilan Mahasiswa (BPM) Periode 2020/2021
- Pengurus Badan Perwakilan Mahasiswa (BPM) Periode 2021/2022