

LAMPIRAN

Lampiran 1. Perhitungan rasio mol minyak jelantah dan mol metanol

Rasio mol minyak jelantah dan metanol = 1:12 (mol/mol)

Massa minyak jelantah = 10 gram

Volume metanol yang dibutuhkan = ...?

$$\begin{aligned}\text{Mol minyak jelantah} &= \frac{\text{massa minyak jelantah}}{BM_{\text{minyak jelantah}}} \\ &= \frac{10 \text{ g}}{856 \text{ g/mol}} \\ &= 0,0116 \text{ mol}\end{aligned}$$

$$\begin{aligned}\text{Mol metanol} &= 12 \times \text{mol minyak jelantah} \\ &= 12 \times 0,0116 \text{ mol} \\ &= 0,14 \text{ mol}\end{aligned}$$

$$\begin{aligned}\text{Massa metanol} &= \text{mol metanol} \times BM_{\text{metanol}} \\ &= 0,14 \text{ mol} \times 32,04 \frac{\text{g}}{\text{mol}} \\ &= 4,4856 \text{ g}\end{aligned}$$

$$\begin{aligned}\text{Volume metanol} &= \frac{\text{massa metanol}}{\rho_{\text{metanol}}} \\ &= \frac{4,4856 \text{ g}}{0,7915 \text{ g/mL}} \\ &= 5,66 \text{ mL}\end{aligned}$$

Lampiran 2. Perhitungan Rasio Mol Metanol Dan Kosolven Aseton

Rasio molar metanol dan kosolven aseton = 1:4

Volume aseton = ...?

$$\text{Mol aseton} = \frac{1}{4} \times \text{mol metanol}$$

$$= \frac{1}{4} \times 0,14 \text{ mol}$$

$$= 0,035 \text{ mol}$$

$$\text{Massa aseton} = \text{mol aseton} \times \text{BM aseton}$$

$$= 0,035 \text{ mol} \times 58,08 \text{ g/mol}$$

$$= 2,0328 \text{ g}$$

$$\text{Volume aseton} = \frac{\text{massa aseton}}{\rho \text{ aseton}}$$

$$= \frac{2,0328 \text{ g}}{0,79 \text{ g/mL}}$$

$$= 2,57 \text{ mL}$$

Lampiran 3. Perhitungan Rasio Perbandingan Minyak Jelantah Dan Metanol

Dalam Proses Pretreatment (Pencucian Minyak Jelantah)

Rasio mol minyak dan metanol = 1:12 (mol/mol)

$$\rho \text{ minyak jelantah} = 0,8 \text{ g/cm}^3$$

Massa minyak jelantah = 30 gram

Volume metanol untuk mencuci = ...?

$$\rho \text{ minyak jelantah} = \frac{\text{massa minyak jelantah}}{\text{volume metanol}}$$

$$\text{Volume metanol} = \frac{\text{massa minyak jelantah}}{\rho \text{ minyak jelantah}}$$

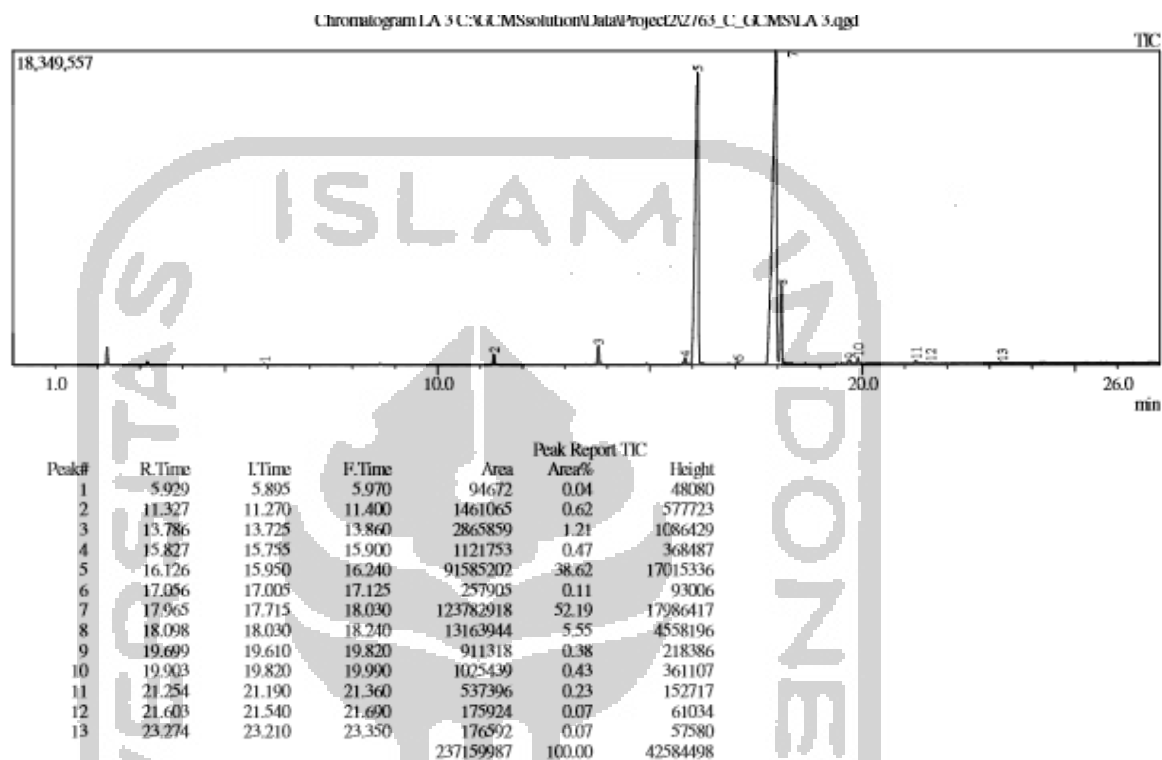
$$\text{Volume metanol} = \frac{30 \text{ g}}{0,8 \text{ g/cm}^3}$$

$$\text{Volume metanol} = 37,5 \text{ cm}^3 \times 12 = 450 \text{ cm}^3 = 450 \text{ ml}$$

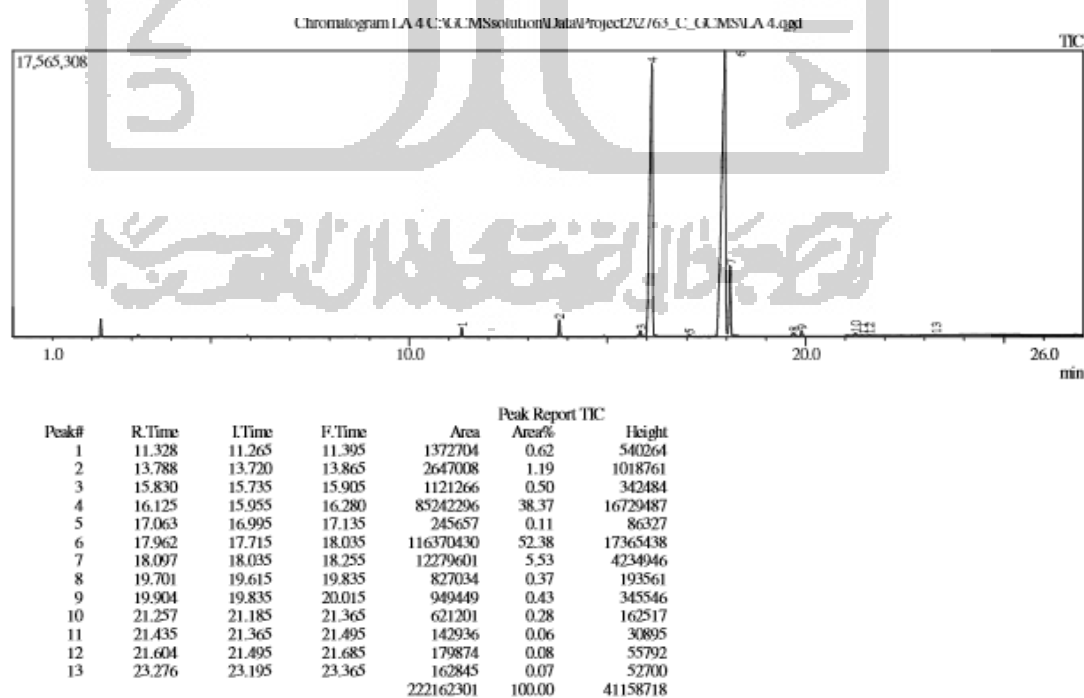


Lampiran 4. Hasil analisis GCMS

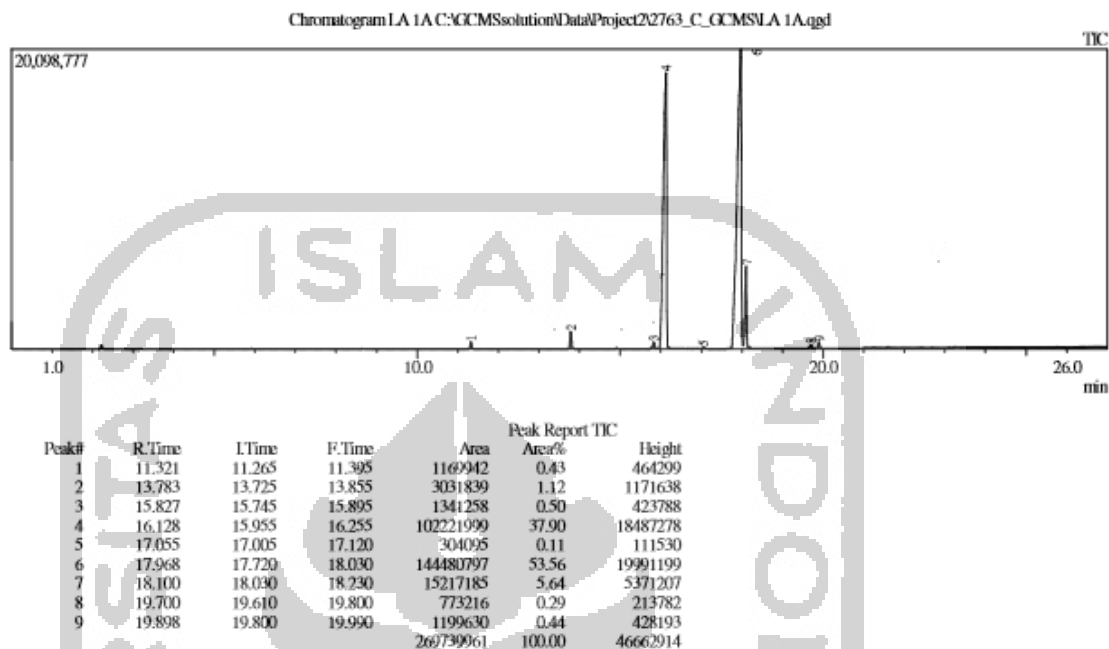
1. Analisis GCMS katalis 900 °C variasi waktu 15 menit



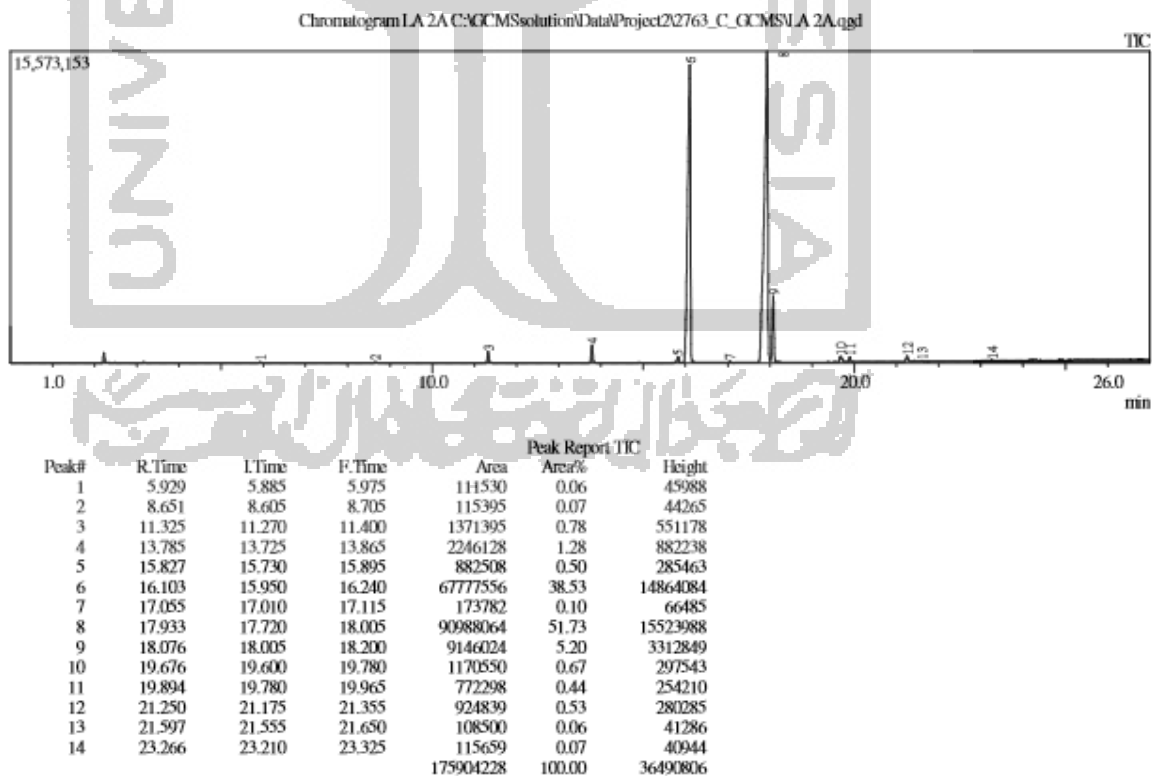
2. Analisis GCMS katalis 1100 °C variasi waktu 15 menit



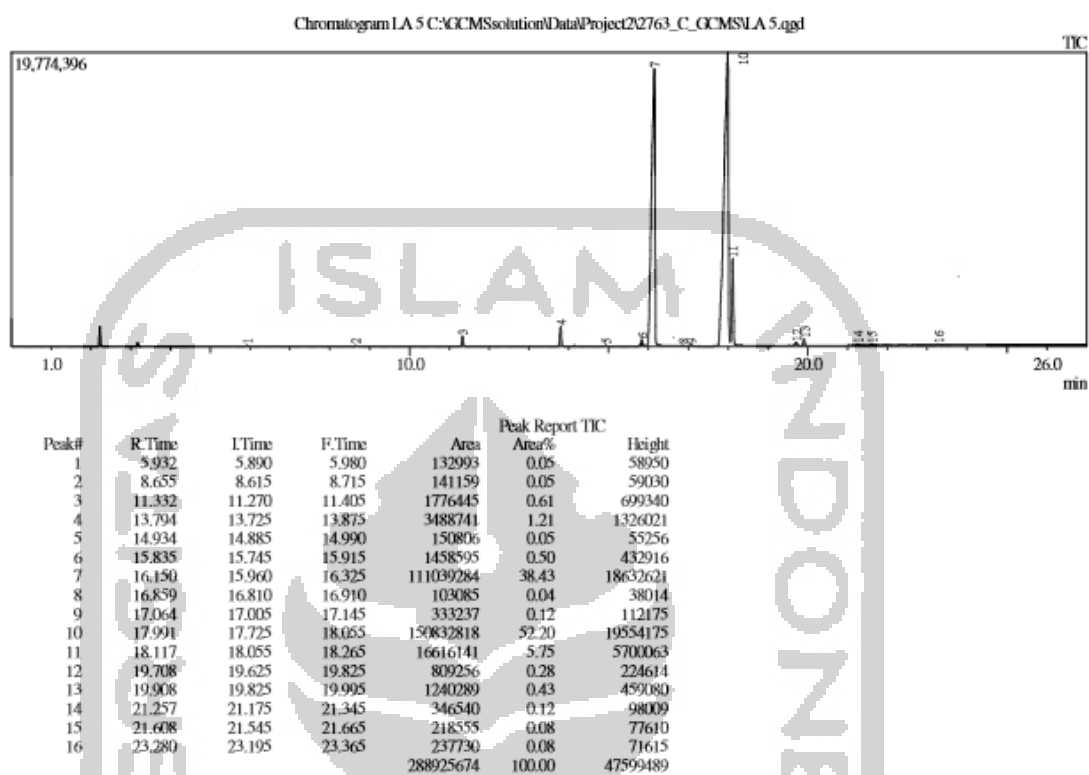
3. Analisis GCMS katalis 900 °C variasi waktu 20 menit



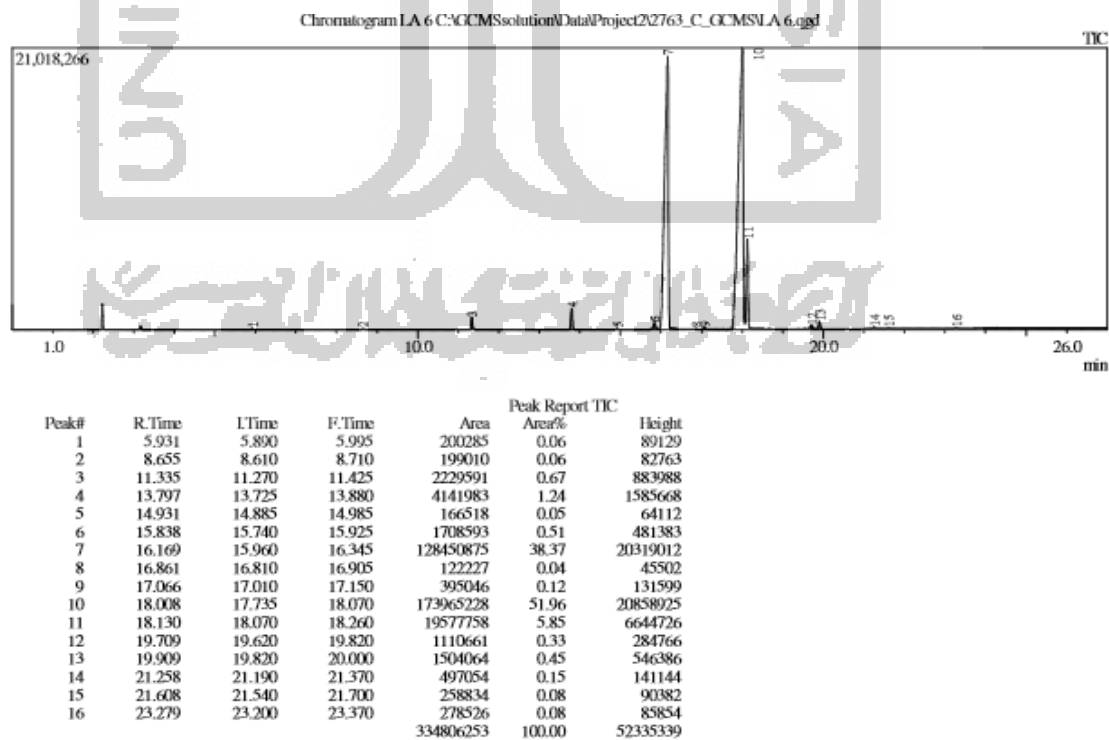
4. Analisis GCMS katalis 1100 °C variasi waktu 20 menit

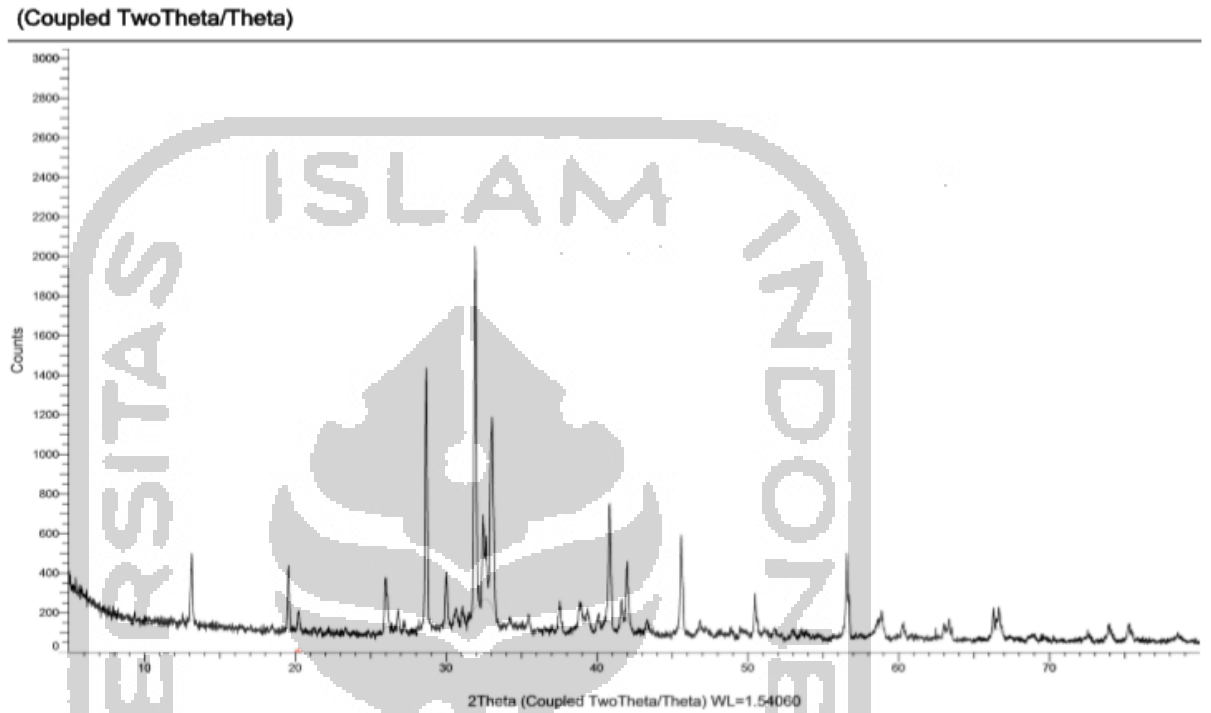
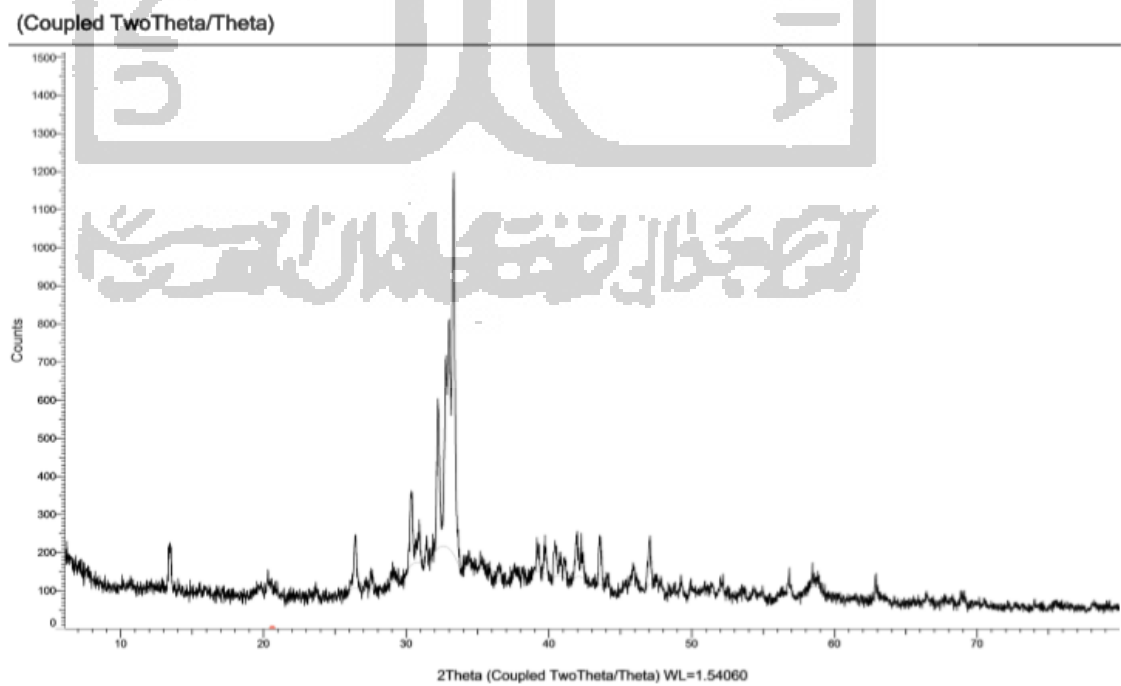


5. Analisis GCMS katalis 900 °C variasi waktu 25 menit



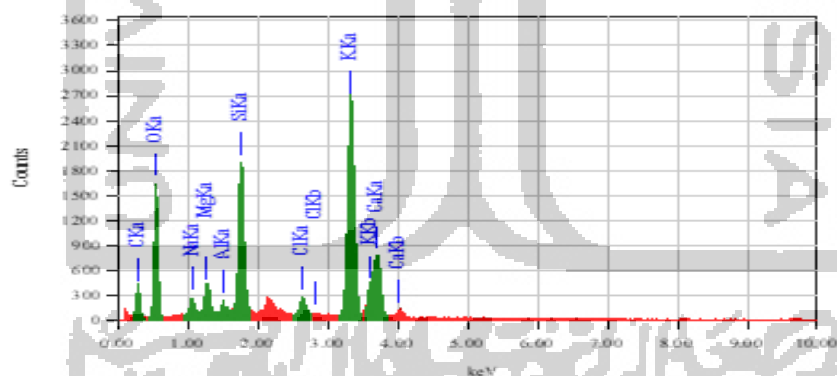
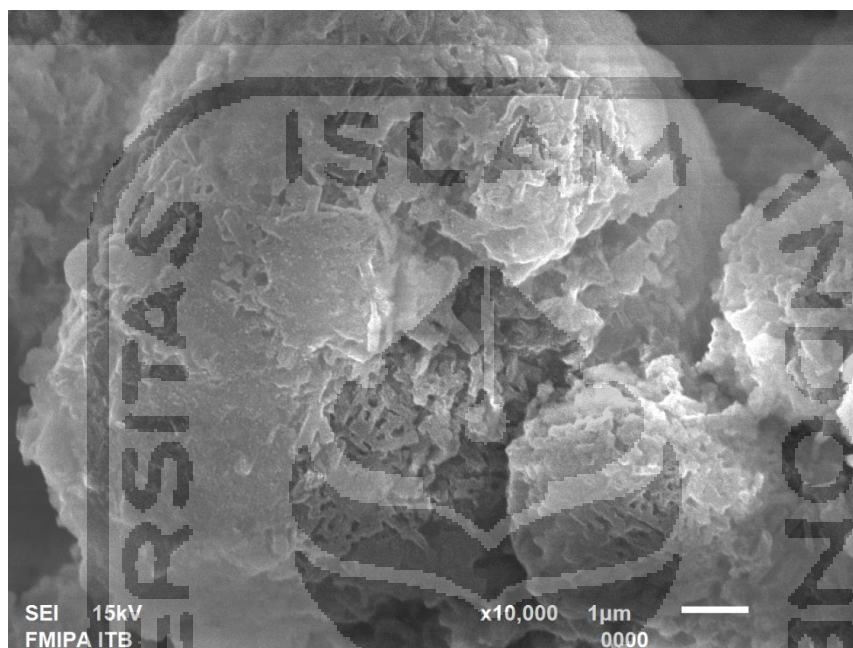
6. Analisis GCMS katalis 1100 °C variasi waktu 25 menit



Lampiran 5. Hasil Karakterisasi XRD Abu Batang Pisang**a. Katalis 900 °C****b. katalis 1100 °C**

Lampiran 6. Hasil Karakterisasi SEM EDX Abu Batang Pisang perbesaran 10000x

a. katalis 900 °C



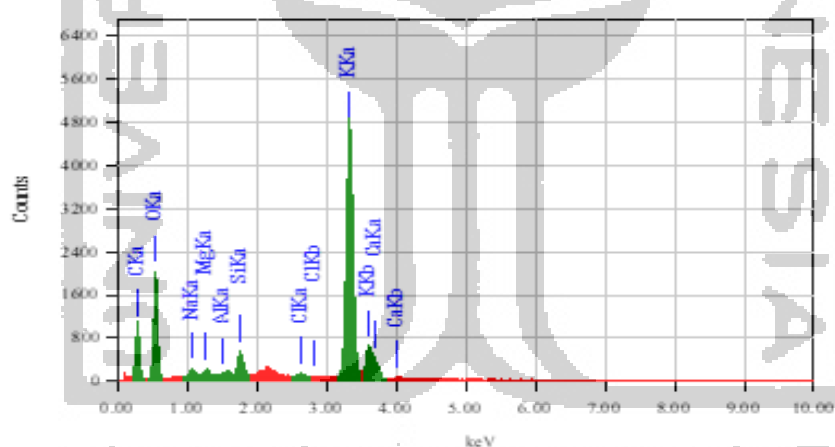
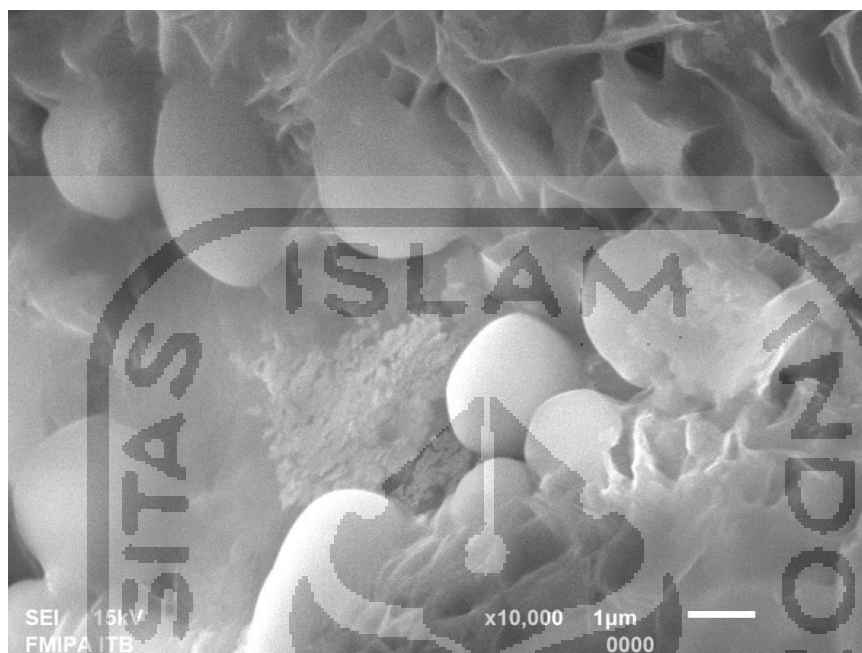
Acquisition Parameter
 Instrument : 6510(LA)
 Acc. Voltage : 15.0 kV
 Probe Current: 1.00000 nA
 PHA mode : TS
 Real Time : 57.28 sec
 Live Time : 50.00 sec
 Dead Time : 12 %
 Counting Rate: 2530 cps
 Energy Range: 0 - 20 keV

ZAF Method Standardless Quantitative Analysis

Fitting Coefficient: 0.3355

Element	(keV)	Mass%	Error%	Atom%	Compound	Mass%	Cation	K
C	0.277	16.84	0.25	27.04				10.8005
O	0.528	41.63	0.39	50.18				18.6562
Na	1.041	0.93	0.14	0.78				1.1698
Mg	1.253	1.50	0.11	1.19				1.8448
Al	1.486	0.34	0.11	0.24				0.4793
Si	1.739	7.61	0.12	5.22				12.3250
Cl	2.621	1.38	0.13	0.75				2.6348
K	3.312	22.57	0.19	11.13				40.0216
Ca	3.690	7.20	0.23	3.47				12.0678
Total		100.00		100.00				

b. katalis 1100 °C



Acquisition Parameter
 Instrument : 6510(LA)
 Acc. Voltage : 15.0 kV
 Probe Current: 1.00000 nA
 PHA mode : T3
 Real Time : 57.99 sec
 Live Time : 50.00 sec
 Dead Time : 13 %
 Counting Rate: 2869 cps
 Energy Range: 0 - 20 keV

ZAF Method Standardless Quantitative Analysis
 Fitting Coefficient: 0.3373

Element	(keV)	Mass%	Error%	Atom%	Compound	Mass%	Cation	K
C	0.277	22.91	0.17	35.04				21.9712
O	0.525	41.59	0.42	47.75				16.9720
Na	1.041	0.57	0.14	0.45				0.6790
Mg	1.253	0.38	0.12	0.28				0.4426
Al								
Si	1.739	1.35	0.12	0.88				2.1356
Cl	2.621	0.21	0.13	0.11				0.3974
K	3.312	30.80	0.19	14.47				53.8701
Ca	3.690	2.20	0.24	1.01				3.5321
Total		100.00		100.00				