

**Lampiran. 1. Perhitungan Teoritis Kadar Cu dalam Garam  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ .**

Katalis dengan Cu = 5% (1 gram Cu dalam 20 gram Zeolit)

$$\begin{aligned} \% \text{ berat Cu} &= \frac{\text{Ar Cu}}{\text{BM CuSO}_4 \cdot 5\text{H}_2\text{O}} \times 100\% \\ &= \frac{63,546}{249,682} \times 100\% \\ &= 25,45\% \end{aligned}$$

40 gram  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  mempunyai kadar Cu sebesar :

$$\begin{aligned} \text{Berat Cu} &= \frac{25,45\%}{100\%} \times 40 \text{ gram} \\ &= 10,1 \text{ gram} \end{aligned}$$

Bila dibuat larutan 250 ml, maka dalam 1 ml mengandung 0,04 gram Cu.

Jadi dalam 25 ml mengandung Cu :

$$\begin{aligned} \text{Berat Cu} &= \frac{0,04 \text{ gram} \cdot 25 \text{ ml}}{1 \text{ ml}} \\ &= 1 \text{ gram Cu} \end{aligned}$$

**Lampiran.2. Hasil AAS dan Contoh perhitungan.**

DIREKTORAT JENDERAL GEOLOGI DAN SUMBERDAYA MINERAL  
**DIREKTORAT VULKANOLOGI**  
**BALAI PENYELIDIKAN DAN PENGEMBANGAN TEKNOLOGI KEGUNUNGAPIAN**  
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LABORATORIUM KIMIA

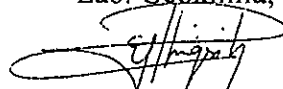
Bentuk Conto : Larutan  
 Pengirim Conto : Andi martin A  
 Asal Conto :  
 No. Analisa : 10/09/LK/1999

HASIL ANALISIS KIMIA  
 (Dalam satuan Abs)

Kode	Cu	Si	Al
Standar 1	25 ppm: Abs= 0,224	25 ppm: Abs = 0,118	1,11 ppm: Abs = 0,102
Standar 2	50 ppm: Abs = 0,433	50 ppm: Abs = 0,249	2,22 ppm: Abs = 0,194
B-1	600 x 0,301	-	-
B-2	400 x 0,318	-	-
B-3	600 x 0,329	-	-
M-1	50 x 0,234	-	-
M-2	400 x 0,263	-	-
M-3	200 x 0,412	-	-

Yogyakarta, 10 November 1999

Lab. Geokimia,



Ir. N. Euis Sutawingsih

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Contoh perhitungan katalis B1 pengenceran 600 x

Berat Sampel yang didekstruksi = 1 gram

$$A = \epsilon b c$$

$$\text{Standar 1.} \quad 0,224 = \epsilon_1 \times 1 \times 25 \text{ ppm}$$

$$\epsilon_1 = 0,00896 \text{ ppm}^{-1}$$

$$\text{Standar 2.} \quad 0,433 = \epsilon_2 \times 1 \times 50 \text{ ppm}$$

$$\epsilon_2 = 0,00866 \text{ ppm}^{-1}$$

$$\epsilon_t = \frac{0,00896 \text{ ppm}^{-1} + 0,00866 \text{ ppm}^{-1}}{2}$$

$$\epsilon_t = 0,00881 \text{ ppm}^{-1}$$

Untuk katalis B1 dengan  $A = 0,301$

$$b = 1 \text{ cm}$$

$$A = \epsilon_t \times b \times c$$

$$c = \frac{A}{b \epsilon_t}$$

$$c = \frac{0,301}{0,00881 \text{ ppm}^{-1}} \times 600$$

$$c = 20499,4 \text{ ppm}$$

Dalam 5 ml larutan = 20499,4 ppm

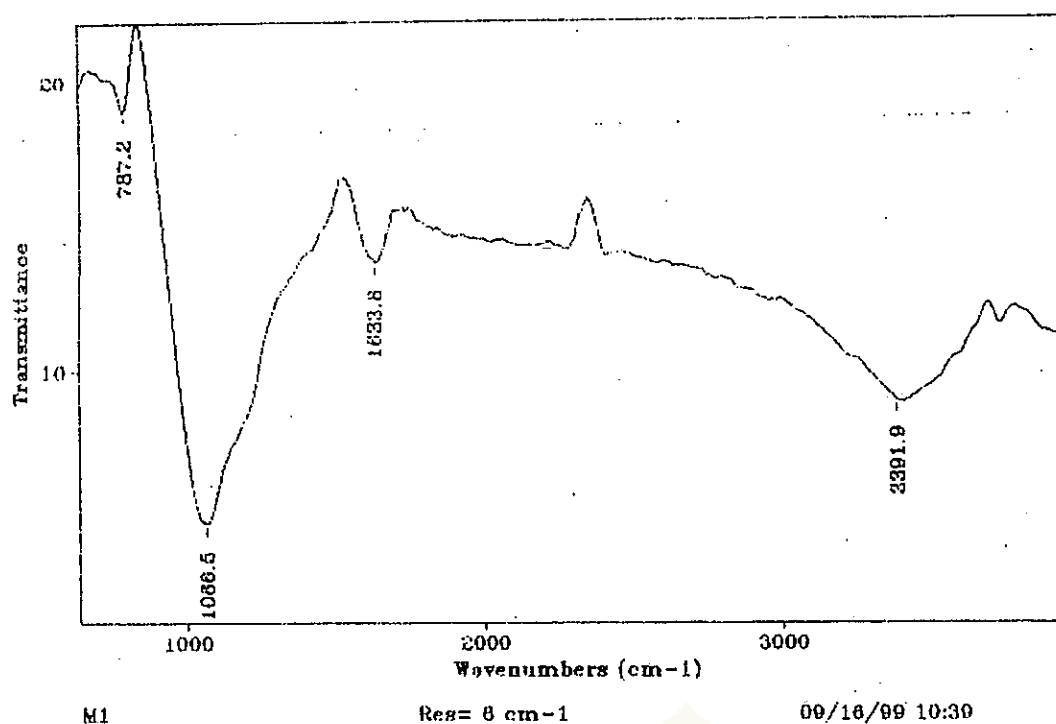
$$= 20499,4 \text{ mg/L}$$

Jadi dalam 5 ml larutan terdapat = 102,49 mg Cu

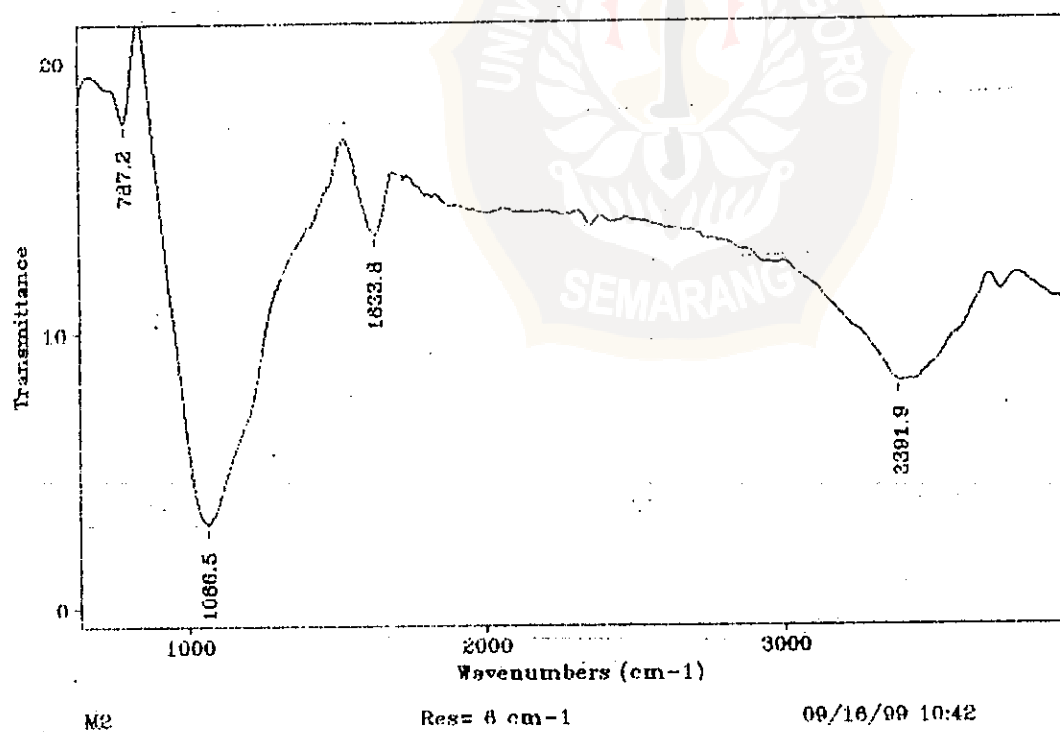
$$\% \text{ Cu} = \frac{102,49 \text{ mg}}{1000 \text{ mg}} \times 100\%$$

$$\% \text{ Cu} = 10,2 \%$$

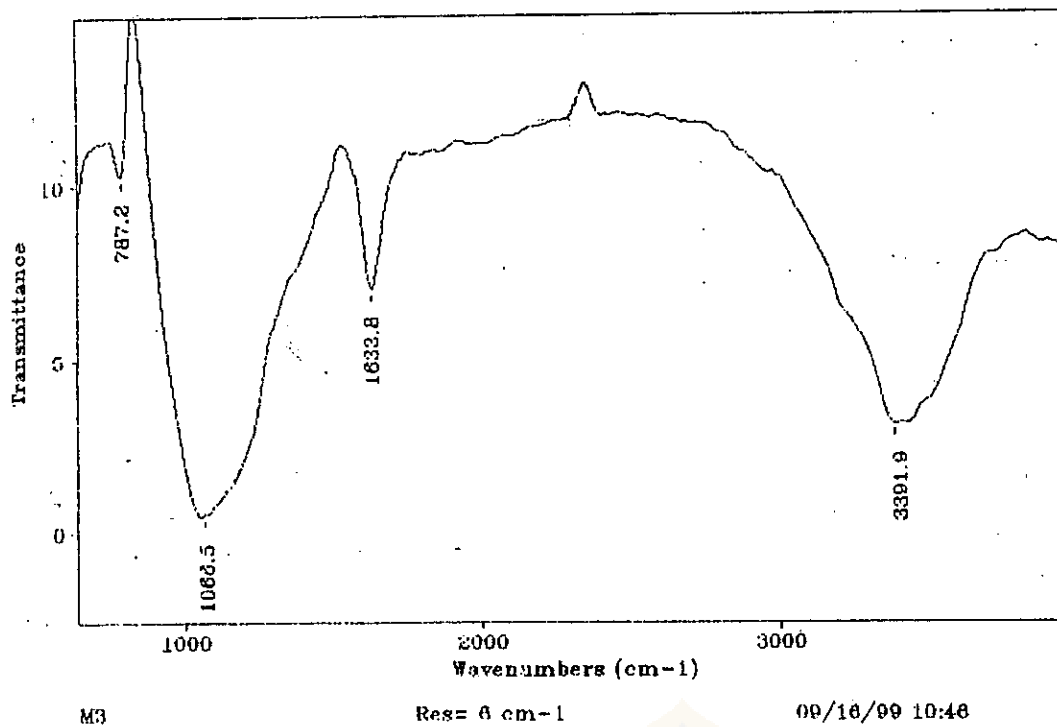
## Lampiran 3.



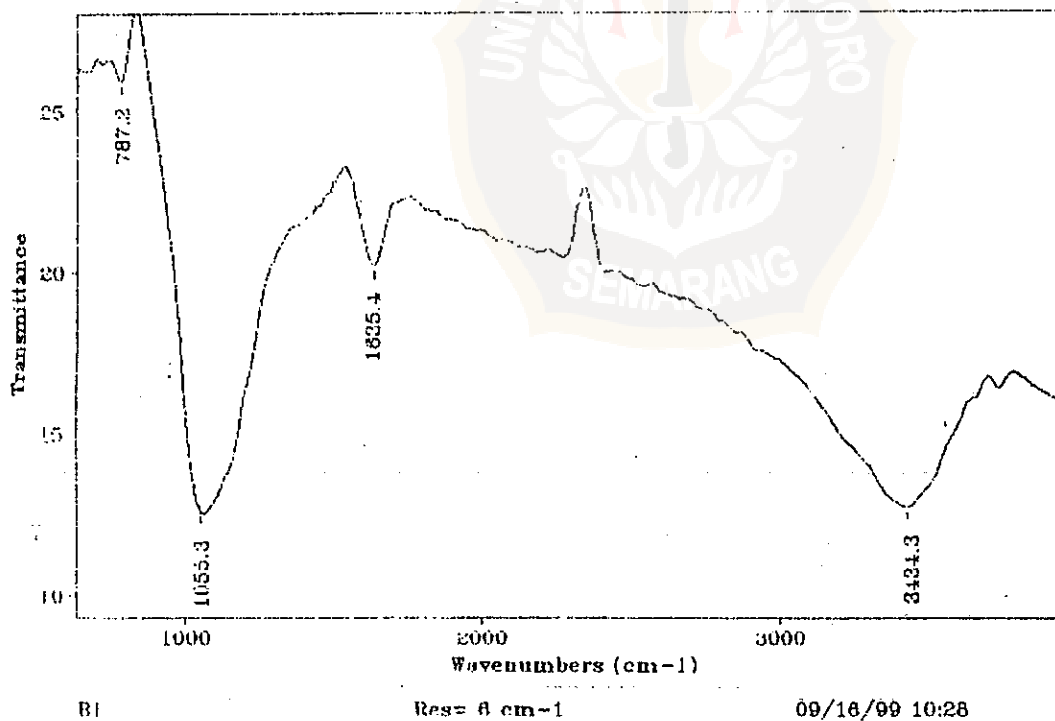
Gambar. 10. Spektra Katalis M1 Sebelum Adsorpsi



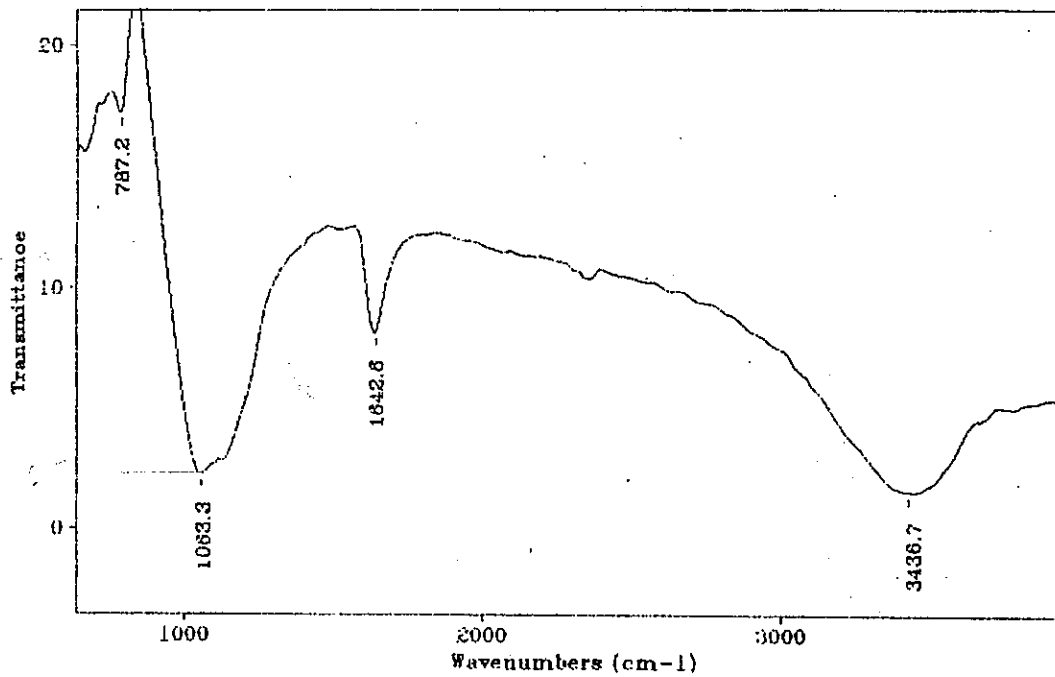
Gambar. 11. Spektra Katalis M2 Sebelum Adsorpsi



Gambar. 12. Spektra Katalis M3 Sebelum Adsorpsi



Gambar. 13. Spektra Katalis B1 Sebelum Adsorpsi

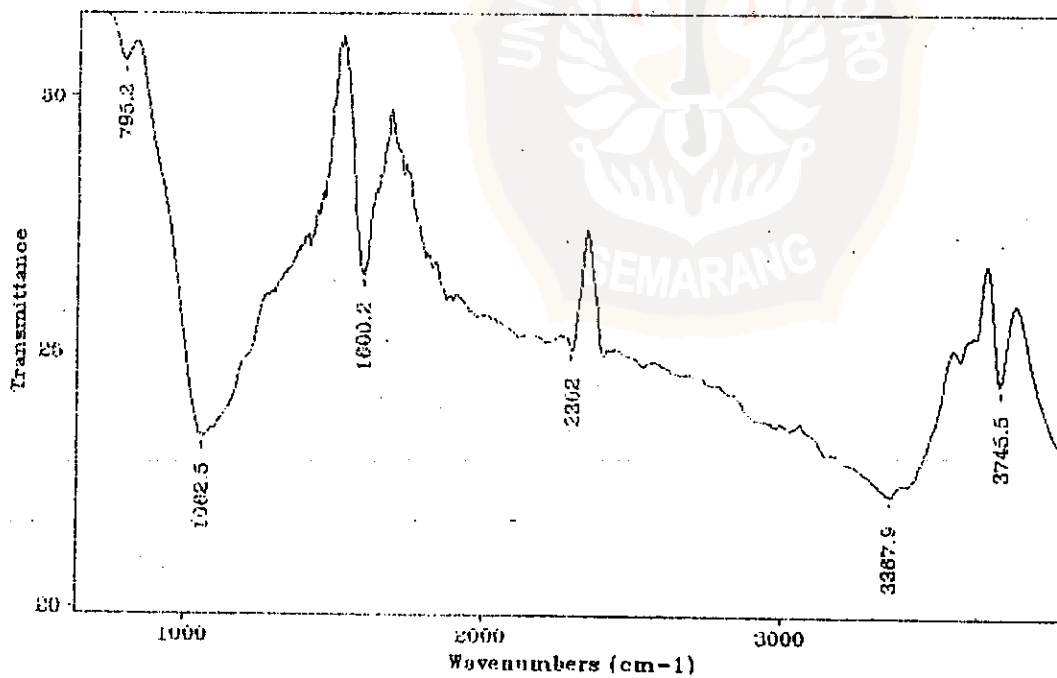


B2

Res= 6 cm<sup>-1</sup>

00/16/09 11:22

Gambar. 14. Spektra Katalis B2 Sebelum Adsorpsi



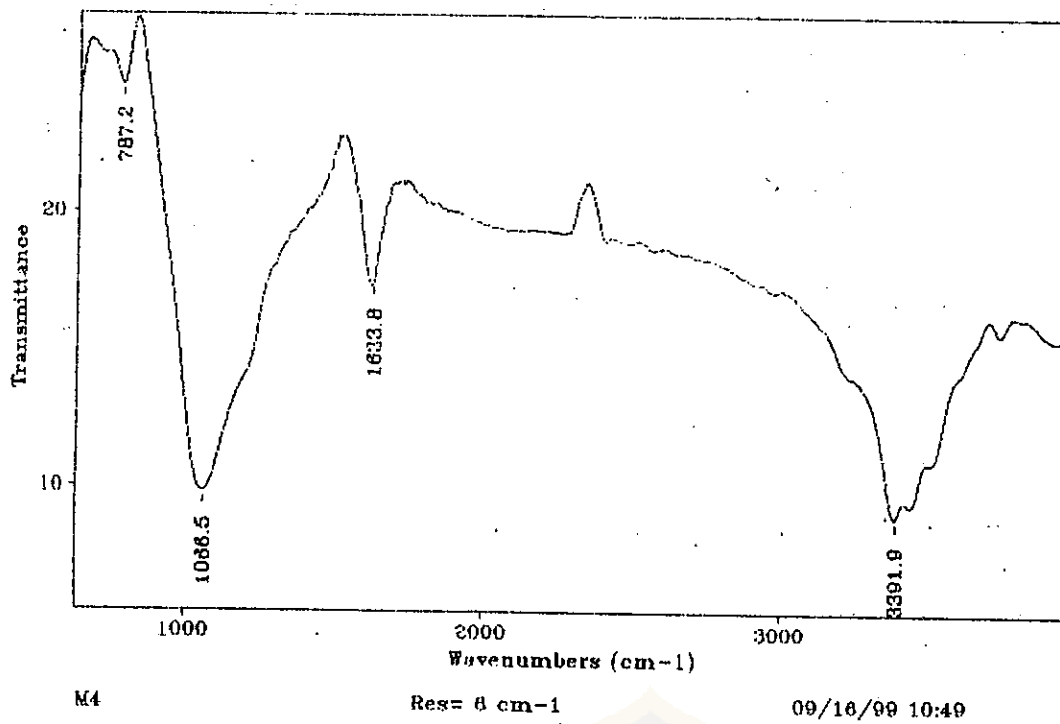
B3

Res= 6 cm<sup>-1</sup>

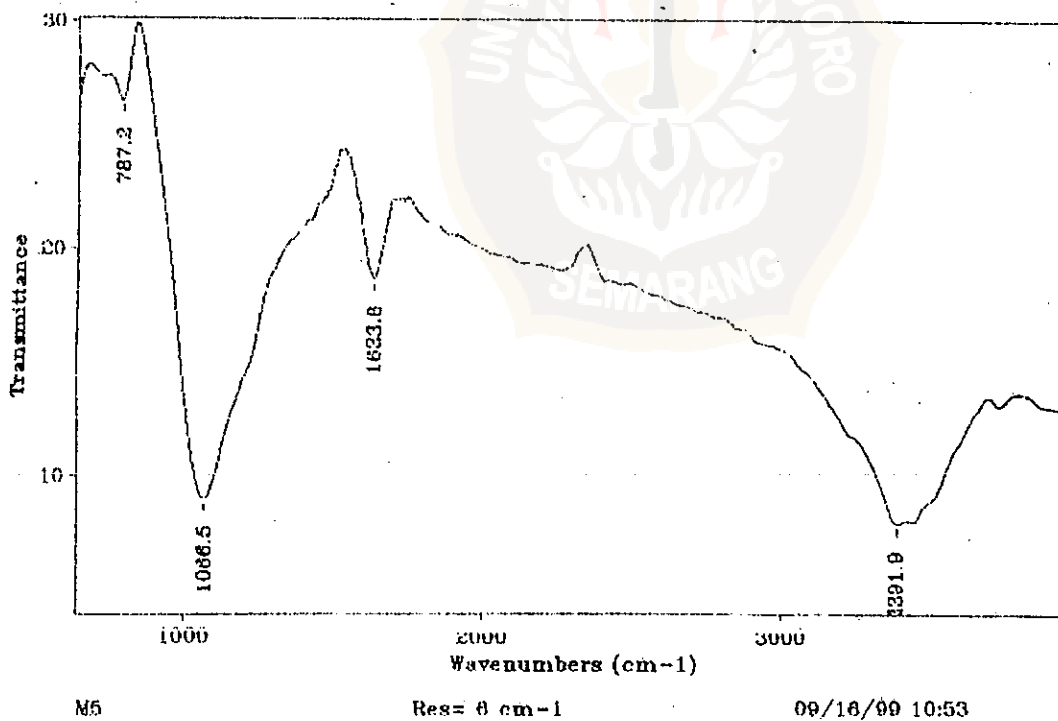
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Gambar. 15. Spektra Katalis B3 Sebelum Adsorpsi

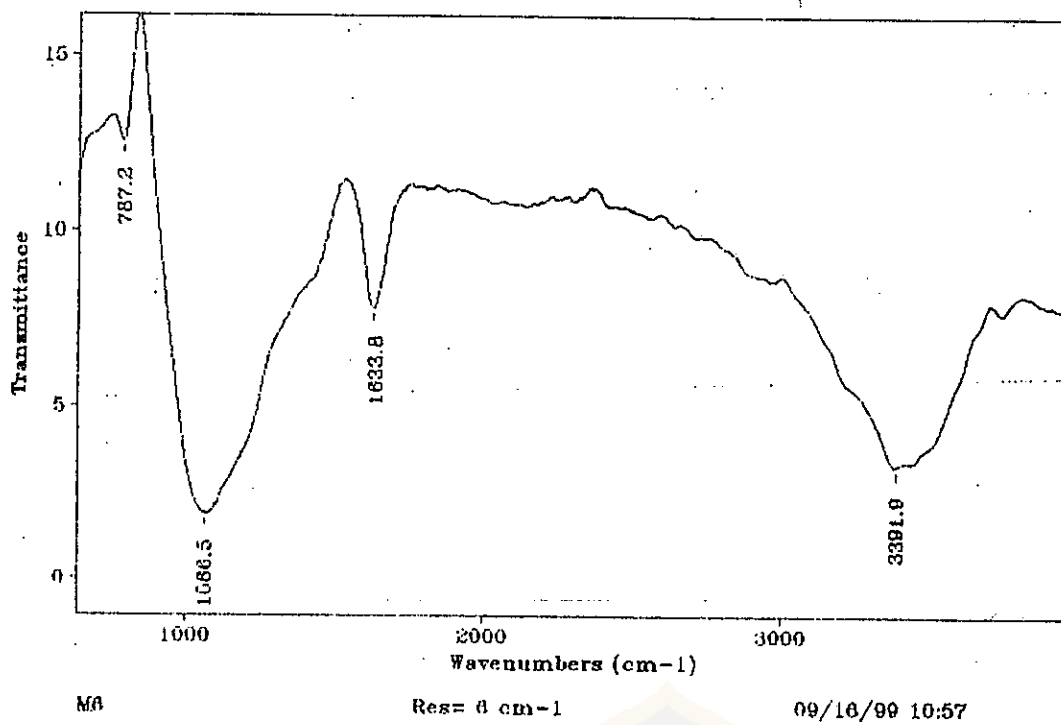
## Lampiran 4.



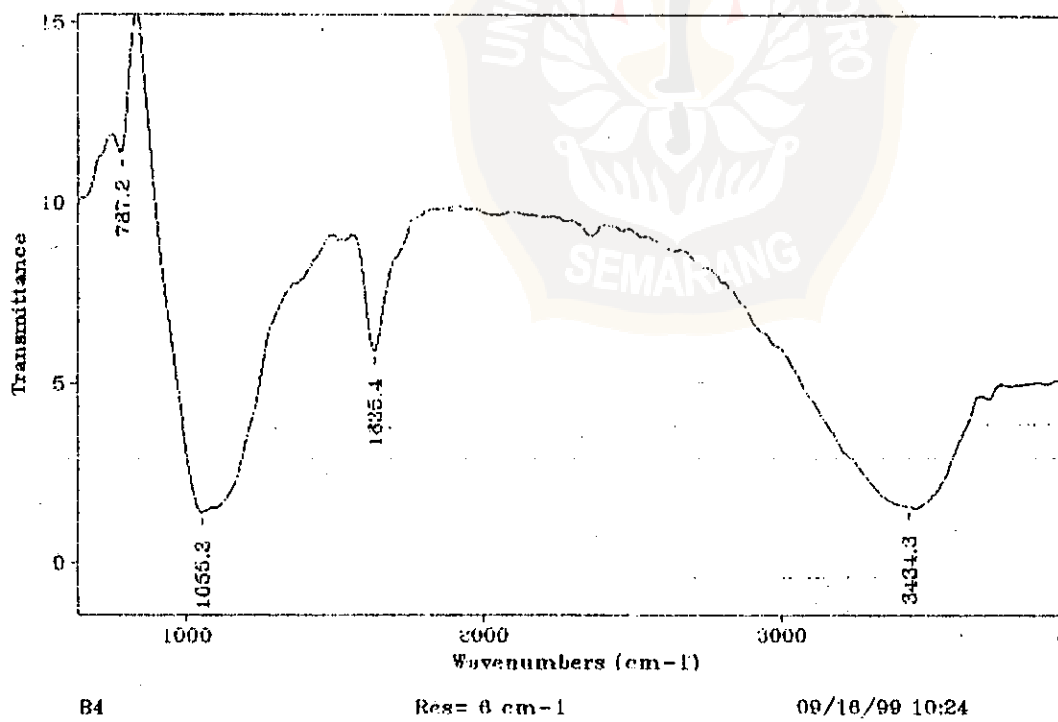
Gambar. 16. Spektra Katalis M1 Setelah Adsorpsi Hidrokarbon Ringan Pada T : 28 °C



Gambar. 17. Spektra Katalis M2 Setelah Adsorpsi Hidrokarbon Ringan Pada T : 28 °C

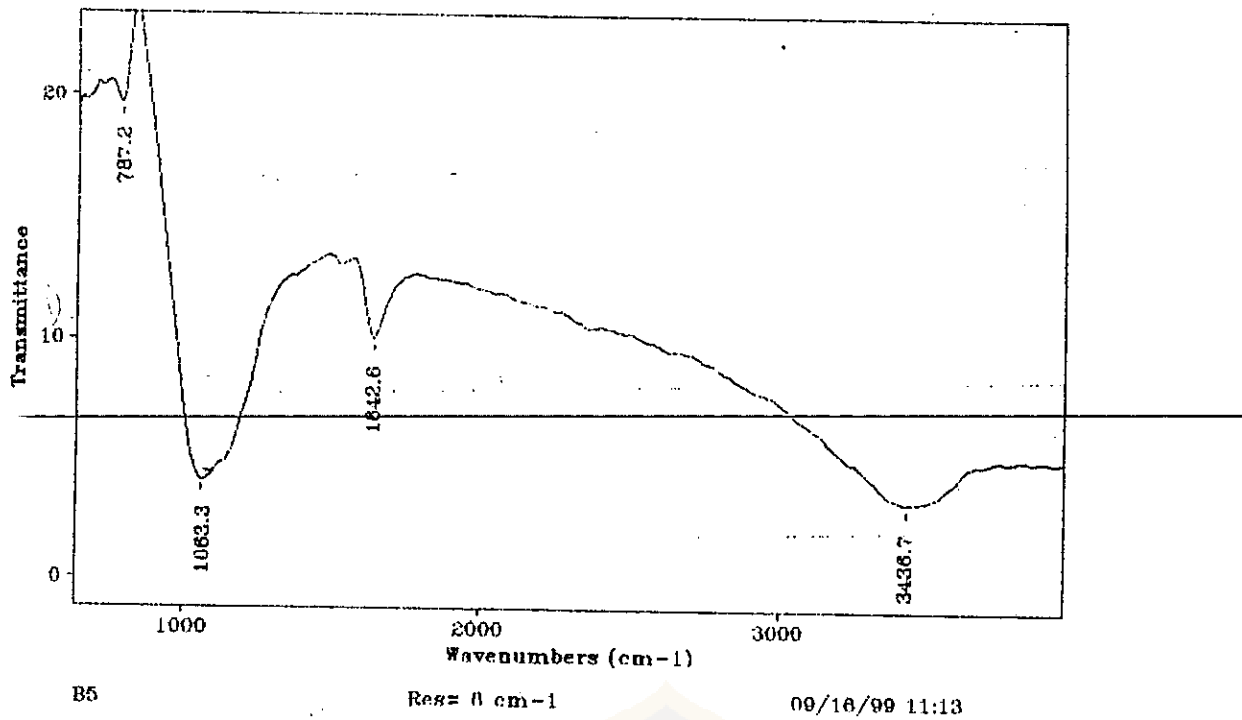


Gambar. 18. Spektra Katalis M3 Setelah Adsorpsi Hidrokarbon Ringan Pada T : 28°C

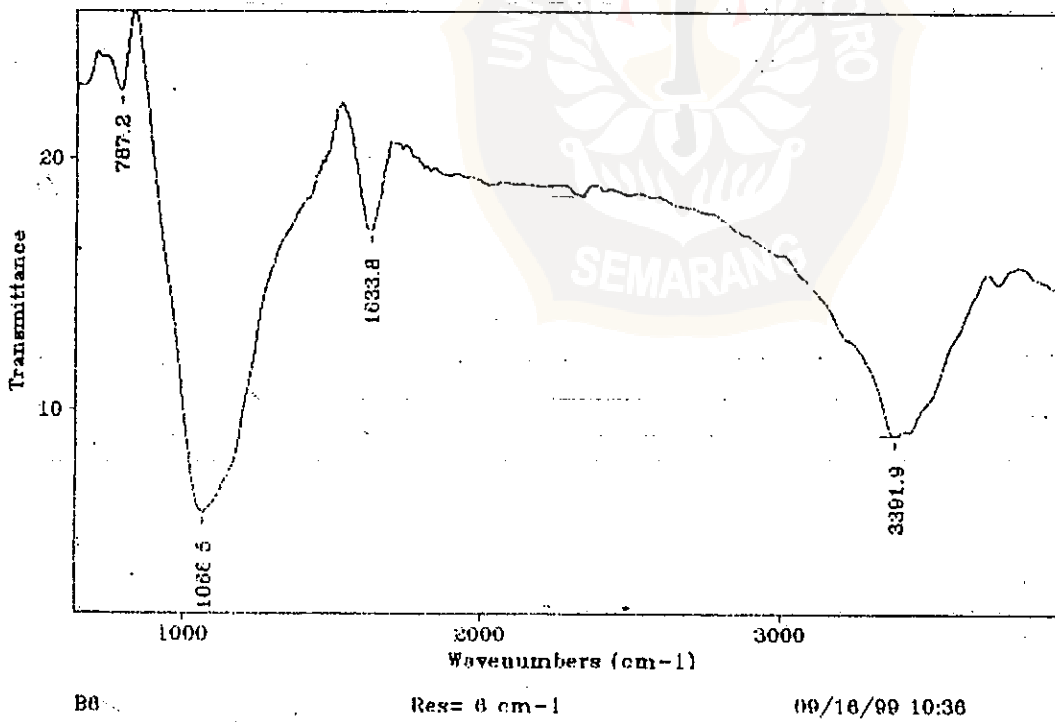


Gambar. 19. Spektra Katalis B1 Setelah Adsorpsi Hidrokarbon Ringan Pada T : 28°C

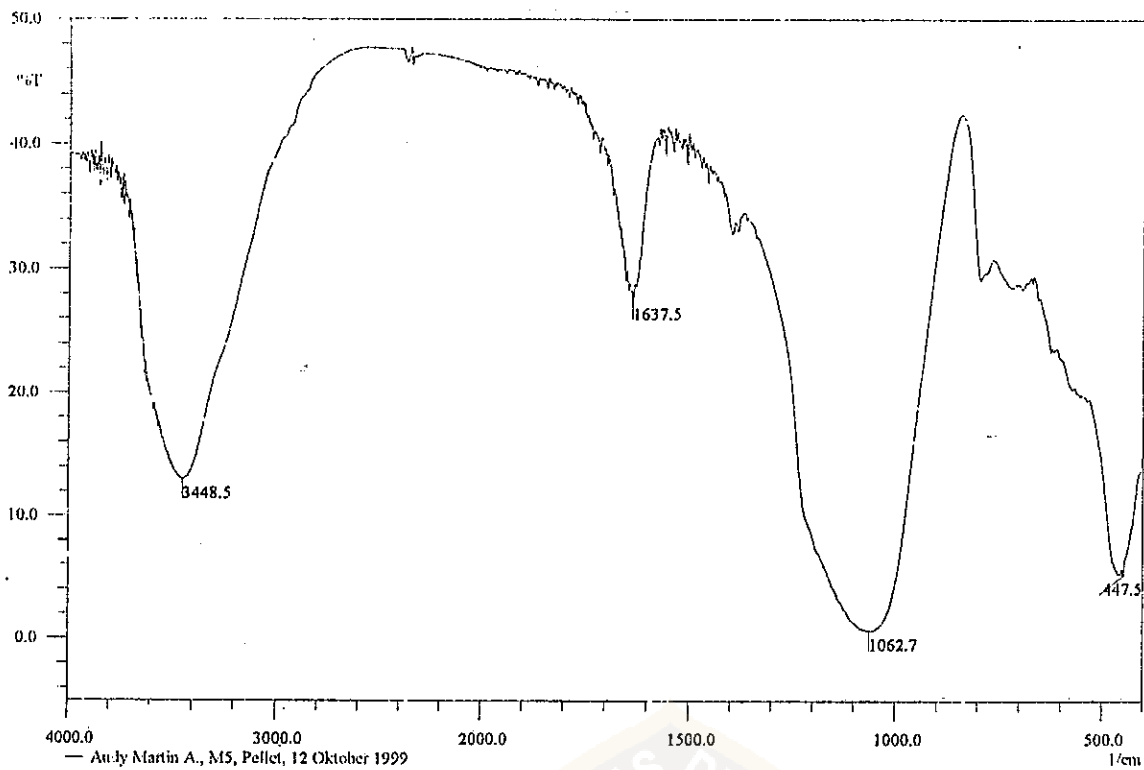




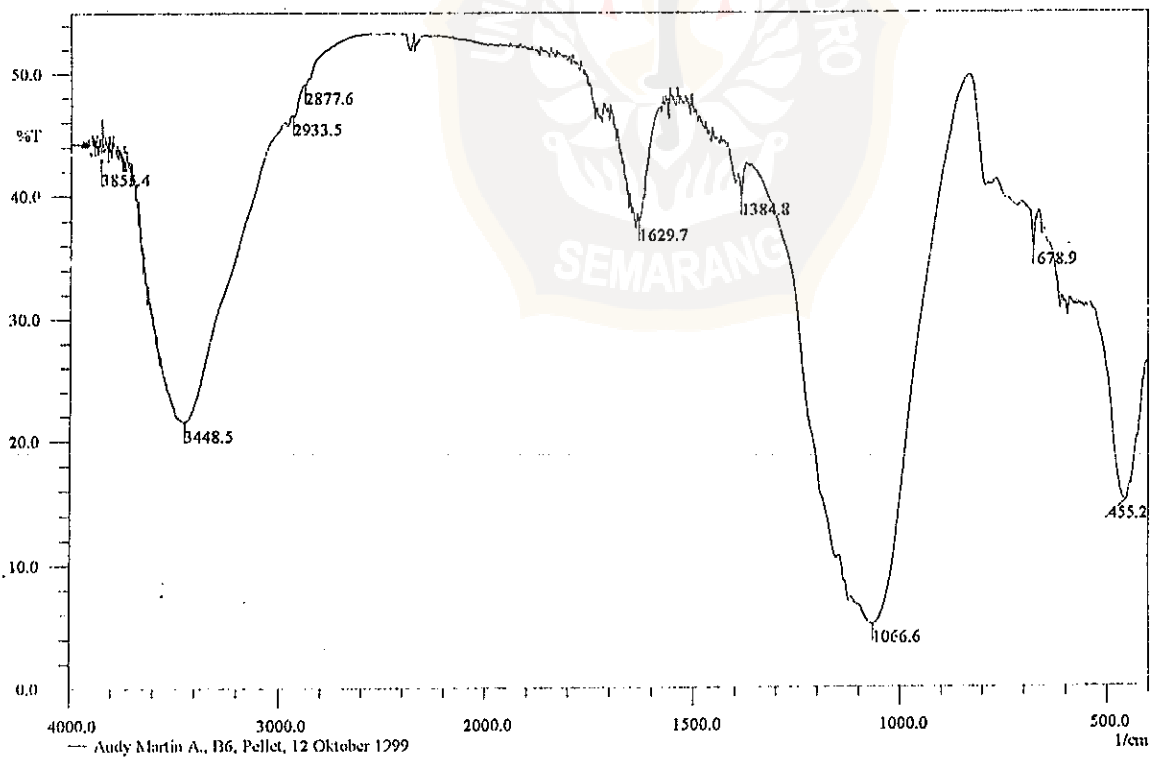
Gambar. 20. Spektra Katalis B2 Setelah Adsorpsi Hidrokarbon Ringan Pada T: 28°C



Gambar. 21. Spektra Katalis B3 Setelah Adsorpsi Hidrokarbon Ringan Pada T : 28°C



**Gambar. 23. Spektra Katalis M2 Setelah Adsorpsi Hidrokarbon Ringan Pada T :200°C**



**Gambar. 27. Spektra Katalis B3 Setelah Adsorpsi Hidrokarbon Ringan Pada T :200°C**