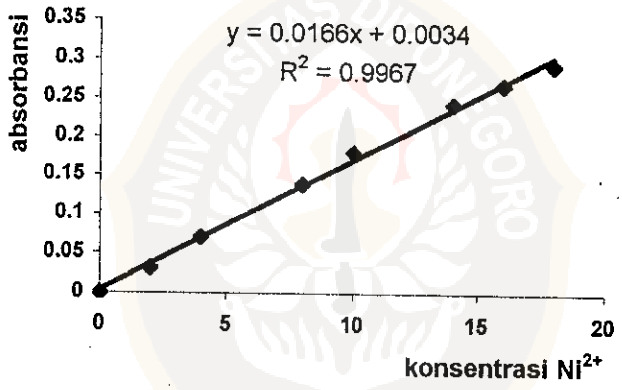
# LAMPIRAN

## Lampiran I: Pembuatan grafik standar.

Tabel 1. Hasil pengukuran absorbansi larutan standar $Ni^{2+}$.

| **Konsentrasi (ppm)** | 2 | 4 | 8 | 10 | 14 | 16 | 18 |
|---|---|---|---|---|---|---|---|
| **Absorbansi** | 0,0318 | 0,0704 | 0,1386 | 0,180 | 0,2425 | 0,2677 | 0,2930 |

Dari data konsentrasi dan absorbansi di atas, diperoleh grafik standar sebagai berikut:




Gambar 1. Grafik standar $Ni^{2+}$

**Lampiran II: Hasil pengukuran absorbansi larutan $Ni^{2+}$ sisa adsorpsi dan kapasitas adsorpsi kitosan pada beberapa nilai pH.**

Tabel 2. Hasil pengukuran absorbansi larutan $Ni^{2+}$ sisa adsorpsi pada beberapa nilai pH (faktor pengenceran = 6).

| **pH** | 4 | 4,5 | 5 | 5,5 | 6 |
|---|---|---|---|---|---|
| **Absorbansi** | 0,1903 | 0,1901 | 0,1898 | 0,1906 | 0,1906 |

Tabel 3. Hasil penghitungan $Ni^{2+}$ teradsorpsi per berat kitosan pada beberapa nilai pH.

| **pH** | 4 | 4,5 | 5 | 5,5 | 6 |
|---|---|---|---|---|---|
| **$Ni^{2+}$ teradsorpsi per berat kitosan ($10^{-2}$) (mg/g)** | 12,2 | 12,5 | 13,1 | 11,6 | 11,6 |

**Lampiran III: Penghitungan jumlah $Ni^{2+}$ yang teradsorpsi oleh kitosan menggunakan persamaan grafik standar.**

$Y = 0,0166X + 0,0034$

Y = absorbansi (A)

X = $[Ni^{2+}]$ sisa adsorpsi (C)

1. pH = 4

A = 0,1903

$Y = 0,0166X + 0,0034$

$0,1903 = 0,0166X + 0,0034$

$$X = \frac{0,1903 - 0,0034}{0,0166}$$

= 11,26 ppm

$[Ni^{2+}]$ sisa adsorpsi = faktor pengenceran x 11,26 ppm

= 6 x 11,26 ppm

= 67,56 ppm

$[Ni^{2+}]$ teradsorpsi = $[Ni^{2+}]$ awal – $[Ni^{2+}]$ sisa adsorpsi

= 70 ppm – 67,56 ppm

= 2,44 ppm

= 2,44 mg/L

$$\frac{\text{Berat } Ni^{2+}}{\text{Berat kitosan}} = \frac{[Ni^{2+}] \text{ teradsorp si x volume larutan}}{0,5g}$$

$$= \frac{2,44 \text{ mg/L} \times 25 \times 10^{-3} \text{L}}{0,5g}$$

$= 12{,}2 \times 10^{-2}$ mg/g

2. pH = 4,5

A = 0,1901

Y = 0,0166X + 0,0034

0,1901 = 0,0166X + 0,0034

$$X = \frac{0{,}1901 - 0{,}0034}{0{,}0166}$$

= 11,25 ppm

$[Ni^{2+}]$ sisa adsorpsi = faktor pengenceran x 11,25 ppm

= 6 x 11,25 ppm

= 67,5 ppm

$[Ni^{2+}]$ teradsorpsi = $[Ni^{2+}]$ awal – $[Ni^{2+}]$ sisa adsorpsi

= 70 ppm – 67,5 ppm

= 2,5 ppm

= 2,5 mg/L

$$\frac{\text{Berat } Ni^{2+}}{\text{Berat kitosan}} = \frac{[Ni^{2+}] \text{ teradsorp si x volume larutan}}{0{,}5g}$$

$$= \frac{2{,}5 \text{ mg/L} \times 25 \times 10^{-3} \text{ L}}{0{,}5g}$$

$= 12{,}5 \times 10^{-2}$ mg/g

3. pH = 5

A = 0,1898

$$Y = 0{,}0166X + 0{,}0034$$

$$0{,}1898 = 0{,}0166X + 0{,}0034$$

$$X = \frac{0{,}1898 - 0{,}0034}{0{,}0166}$$

$$= 11{,}23 \text{ ppm}$$

$[Ni^{2+}]$ sisa adsorpsi = faktor pengenceran x 11,23 ppm

$$= 6 \times 11{,}23 \text{ ppm}$$

$$= 67{,}38 \text{ ppm}$$

$[Ni^{2+}]$ teradsorpsi = $[Ni^{2+}]$ awal – $[Ni^{2+}]$ sisa adsorpsi

$$= 70 \text{ ppm} - 67{,}38 \text{ ppm}$$

$$= 2{,}62 \text{ ppm}$$

$$= 2{,}62 \text{ mg/L}$$

$$\frac{\text{Berat } Ni^{2+}}{\text{Berat kitosan}} = \frac{[Ni^{2+}] \text{ teradsorp si x volume larutan}}{0{,}5g}$$

$$= \frac{2{,}62 \text{ mg/L} \times 25 \times 10^{-3} \text{ L}}{0{,}5g}$$

$$= 13{,}1 \times 10^{-2} \text{ mg/g}$$

4. pH = 5,5

$$A = 0{,}1906$$

$$Y = 0{,}0166X + 0{,}0034$$

$$0{,}1906 = 0{,}0166X + 0{,}0034$$

$$X = \frac{0{,}1906 - 0{,}0034}{0{,}0166}$$

= 11,28 ppm

$[Ni^{2+}]$ sisa adsorpsi = faktor pengenceran x 11,28 ppm

= 6 x 11,28 ppm

= 67,68 ppm

$[Ni^{2+}]$ teradsorpsi = $[Ni^{2+}]$ awal – $[Ni^{2+}]$ sisa adsorpsi

= 70 ppm – 67,68 ppm

= 2,32 ppm

= 2,32 mg/L

$$\frac{\text{Berat } Ni^{2+}}{\text{Berat kitosan}} = \frac{[Ni^{2+}] \text{ teradsorpsi x volume larutan}}{0{,}5g}$$

$$= \frac{2{,}32 \text{ mg/L} \times 25 \times 10^{-3} \text{ L}}{0{,}5g}$$

$= 11{,}6 \times 10^{-2}$ mg/g

5. pH = 6

A = 0,1906

Y = 0,0166X + 0,0034

0,1906 = 0,0166X + 0,0034

$$X = \frac{0{,}1906 - 0{,}0034}{0{,}0166}$$

= 11,28 ppm

$[Ni^{2+}]$ sisa adsorpsi = faktor pengenceran x 11,28 ppm

= 6 x 11,28 ppm

$$= 67{,}68 \text{ ppm}$$

$$[Ni^{2+}] \text{ teradsorpsi} = [Ni^{2+}] \text{ awal} - [Ni^{2+}] \text{ sisa adsorpsi}$$

$$= 70 \text{ ppm} - 67{,}68 \text{ ppm}$$

$$= 2{,}32 \text{ ppm}$$

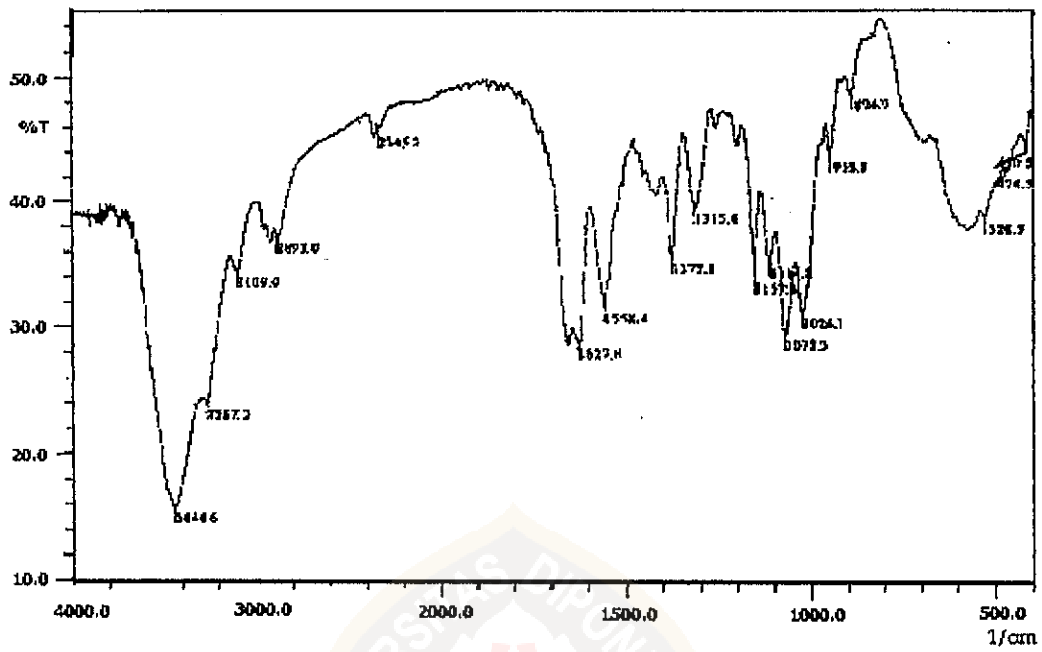
$$= 2{,}32 \text{ mg/L}$$

$$\frac{\text{Berat } Ni^{2+}}{\text{Berat kitosan}} = \frac{[Ni^{2+}] \text{ teradsorp si x volume larutan}}{0{,}5g}$$

$$= \frac{2{,}32 \text{ mg/L x } 25 \text{ x } 10^{-3} \text{L}}{0{,}5g}$$

$$= 11{,}6 \text{ x } 10^{-2} \text{ mg/g}$$

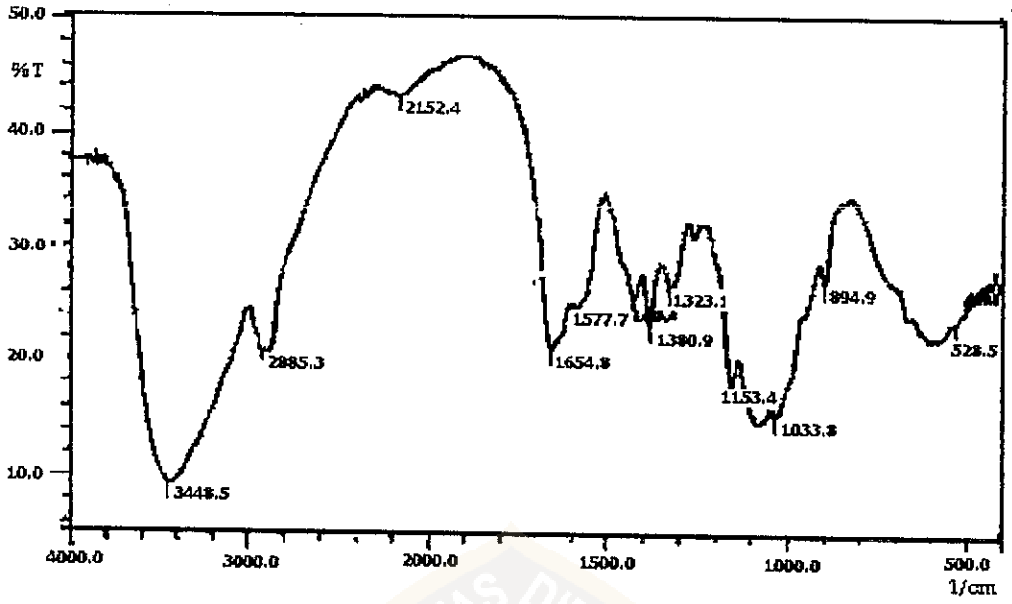
## Lampiran IV: Spektra FTIR Kitin.




Chitin, Dwi Yulianto Azis, pelet, 28-01-02
Peaktable of DWI-Y1. IRS, 18 Peaks
Treshhold: 80, Noise: 1,5 No Range Selection

| Nr. | Pos (1/cm) | Inten. (%T) |
|---|---|---|
| 1. | 420.5 | 44.149 |
| 2. | 474.5 | 42.495 |
| 3. | 528.5 | 38.842 |
| 4. | 894.9 | 48.813 |
| 5. | 952.8 | 43.819 |
| 6. | 1026.1 | 31.330 |
| 7. | 1072.3 | 29.621 |
| 8. | 1114.8 | 35.348 |
| 9. | 1157.2 | 35.754 |
| 10. | 1315.4 | 39.637 |
| 11. | 1377.1 | 35.624 |
| 12. | 1558.4 | 31.691 |
| 13. | 1627.8 | 28.896 |
| 14. | 2345.3 | 45.715 |
| 15. | 2893.0 | 37.210 |
| 16. | 3109.0 | 34.439 |
| 17. | 3267.2 | 23.985 |
| 18. | 3444.6 | 15.820 |

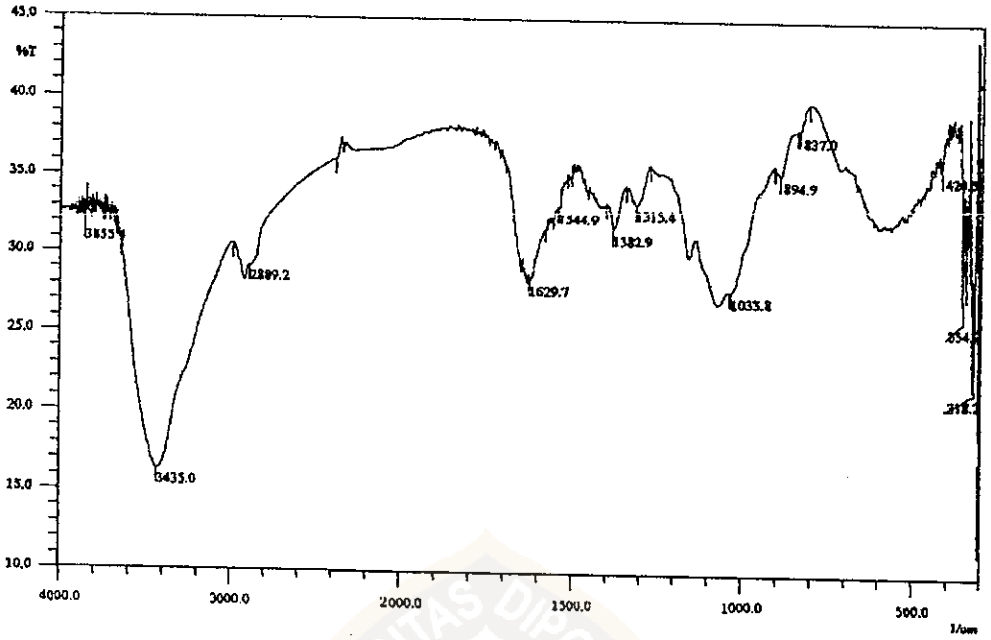
## Lampiran V: Spektra FTIR Kitosan.




Chitosan, Dwi Yulianto Azis, pelet, 28-01-02
Peaktable of DWI-Y.IRS, 13 Peaks
Threshhold: 80, Noise: 1.5, No Range Selection

| Nr. | Pos (1/cm) | Inten. (%T) |
|---|---|---|
| 1. | 420.5 | 26.637 |
| 2. | 528.5 | 23.170 |
| 3. | 894.9 | 26.832 |
| 4. | 1033.8 | 15.085 |
| 5. | 1153.4 | 17.971 |
| 6. | 1323.1 | 26.120 |
| 7. | 1380.9 | 23.061 |
| 8. | 1423.4 | 25.494 |
| 9. | 1577.7 | 24.624 |
| 10. | 1654.8 | 20.965 |
| 11. | 2152.4 | 43.184 |
| 12. | 2885.3 | 20.656 |
| 13. | 3448.5 | 9.345 |

## Lampiran VI: Spektra FTIR Kompleks Kitosan – Ni.

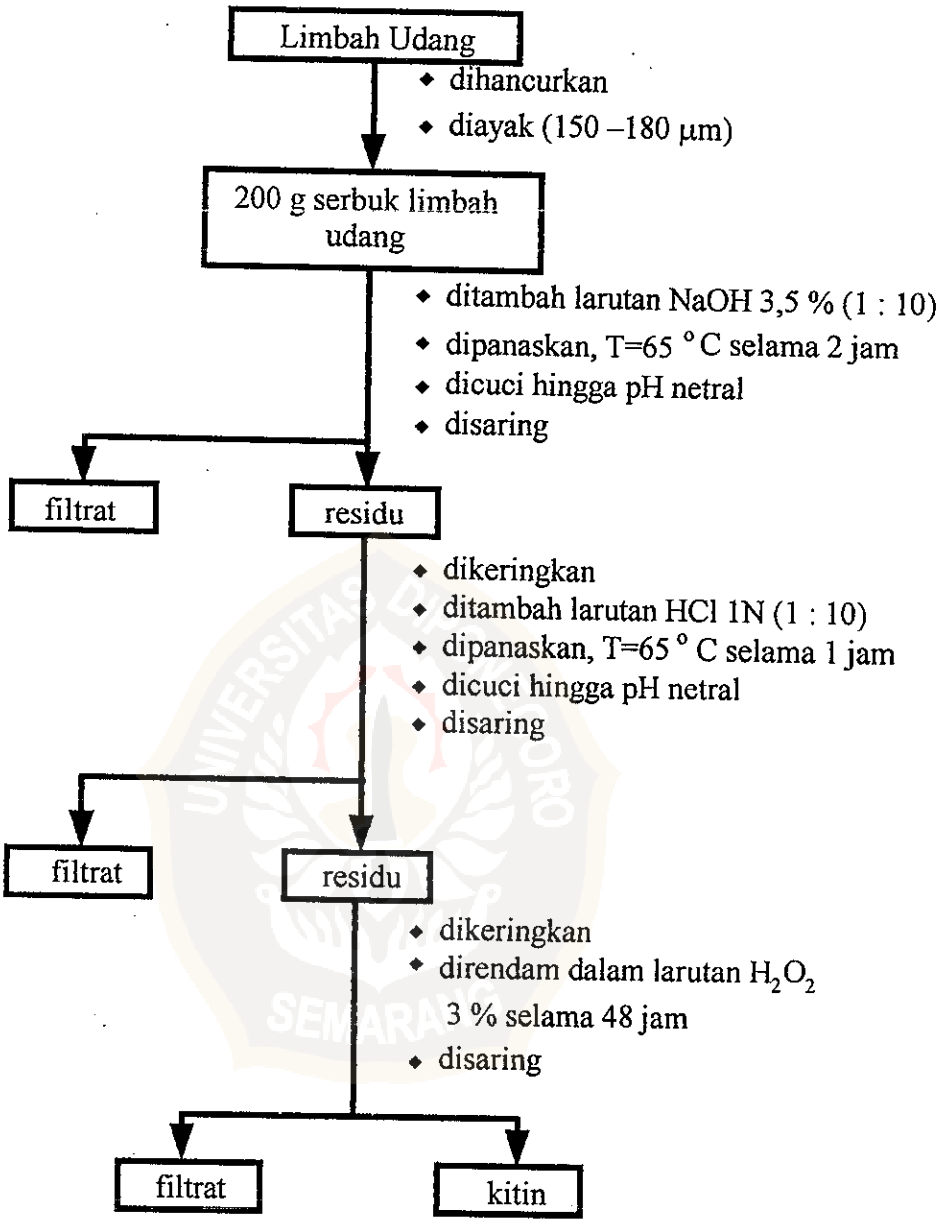



-Kompleks Chitosan – Ni(II), Dwi Y. A. pelet,, 13-05-2002
Peaktable of DWIYA4.IRS, 13 Peaks
Threshhold: 80, Noise: 15, No Range Selection

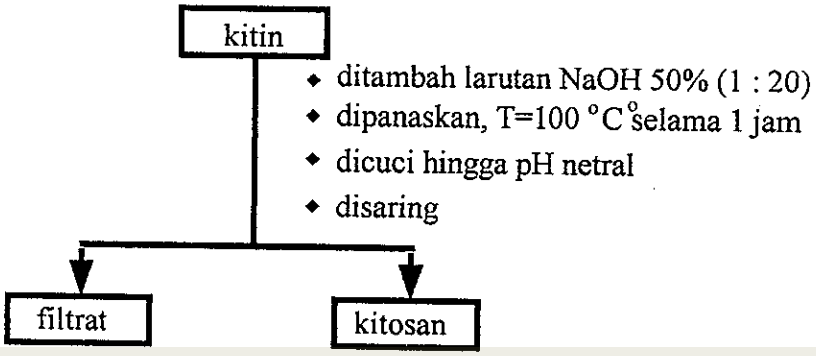
| Nr. | Pos (1/cm) | Inten. (%T) |
|---|---|---|
| 1. | 318.2 | 21.619 |
| 2. | 354.9 | 26.123 |
| 3. | 420.5 | 35.806 |
| 4. | 837.0 | 38.182 |
| 5. | 894.9 | 35.348 |
| 6. | 1033.8 | 27.881 |
| 7. | 1315.4 | 33.423 |
| 8. | 1382.9 | 31.781 |
| 9. | 1544.9 | 33.144 |
| 10. | 1629.7 | 28.494 |
| 11. | 2889.2 | 29.198 |
| 12. | 3435.0 | 16.300 |
| 13. | 3855.4 | 31.633 |

**Lampiran VII: Skema Kerja**

**Isolasi**

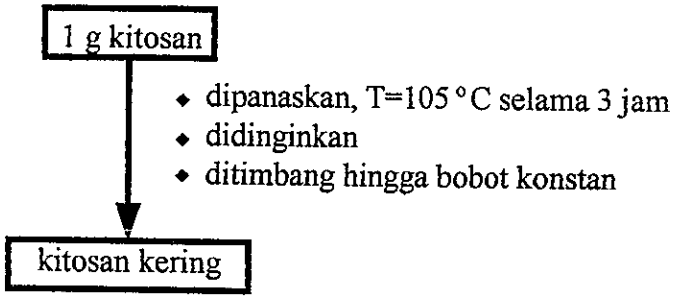



**Transformasi**



## Identifikasi Kitosan

### Kadar Air



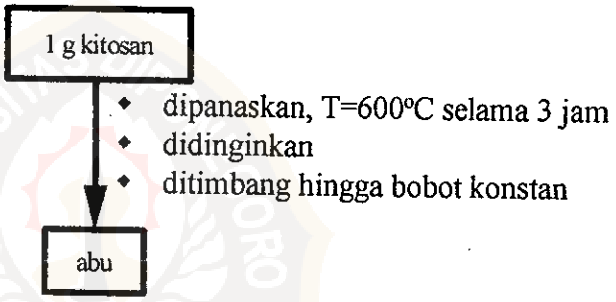

$$\text{Kadar air} = \frac{a - b}{c} \times 100\ \%$$

a = berat cawan porselin dan kitosan sebelum dipanaskan

b = berat cawan porselin dan kitosan setelah dipanaskan

c = berat kitosan sebelum dipanaskan

### Kadar abu




$$\text{Kadar abu} = \frac{a}{b} \times 100\ \%$$

a = berat abu

b = berat kitosan

### Adsorpsi