

## LAMPIRAN 1 PERHITUNGAN

### 1.1 Perhitungan Molar metanil yellow

Kelarutan metanil yellow dalam air = 25 g/L dalam 20°C

$M_r = 375,38 \text{ g/mol}$

$$M = \frac{\text{Kelarutan metanil yellow}}{M_r}$$

$$M = \frac{25 \text{ g/L}}{375,38 \text{ g/mol}}$$

$$M = 0,0665$$

Yang dipakai 0,05 M

### 1.2 Perhitungan larutan induk metanil yellow

$$BM = 375,38 \text{ g/mol}$$

$$M = \frac{\text{mol}}{L}$$

$$0,05 \text{ M metanil yellow} = \frac{\text{gram}}{M_r \cdot L}$$

$$0,05 \text{ M metanil yellow} = \frac{\text{gram}}{375,38 \cdot L}$$

$$\text{Jumlah metanil yellow} = 18,769 \text{ gram/L}$$

$$= 1,8769 \text{ gram/100 mL}$$

$$= 0,93845 \text{ gram/50 mL}$$

Untuk membuat larutan induk metanil yellow 0,05 M sebanyak 50 mL dibutuhkan 0,93845 gram metanil yellow.

### 1.3 Perhitungan dan Pembuatan Larutan Na-Metanil Yellow $1 \times 10^{-1} - 1 \times 10^{-8} \text{ M}$

- Larutan Na-metanil yellow  $1 \times 10^{-1} \text{ M}$  dari Na-metanil yellow 0,5 M maka

$$V_1 \times M_1 = V_2 \times M_2$$

$$V_1 \times 0,05 = 50 \text{ ml} \times 10^{-1} \text{ M}$$

$$V_1 = 10 \text{ ml}$$

- Larutan Na-metanil yellow  $1 \times 10^{-2} \text{ M}$  dari Na-metanil yellow  $1 \times 10^{-1} \text{ M}$  maka

$$V_1 \times M_1 = V_2 \times M_2$$

$$V_1 \times 10^{-2} = 50 \text{ ml} \times 10^{-1} \text{ M}$$

$$V_1 = 5 \text{ ml}$$

- Larutan Na-Metanil Yellow  $1 \times 10^{-3}$  M dari Na-Metanil Yellow  $1 \times 10^{-2}$  M maka  

$$V_1 \times M_1 = V_2 \times M_2$$

$$V_1 \times 10^{-3} = 50 \text{ ml} \times 10^{-2} \text{ M}$$

$$V_1 = 5 \text{ ml}$$
- Pembuatan larutan  $1 \times 10^{-4}$ – $1 \times 10^{-5}$  M dilakukan dengan cara yang sama pada pembuatan larutan Na-metanil yellow  $1 \times 10^{-3}$  M dengan mengencerkan larutan yang konsentrasinya lebih tinggi  $10^{-2}$  M dari larutan yang ingin dibuat.

#### 1.4 Pembuatan Larutan Asam Asetat 3% (v/v)

Larutan asam asetat 3% dibuat dengan memipet asam asetat glasial sebanyak 3 ml ke dalam labu ukur 100 ml kemudian ditambahkan aquades hingga tanda batas.

$$\text{Volume CH}_3\text{COOH 3\% (v/v)} = \frac{\text{Volume CH}_3\text{COOH}}{\text{Volume (ml)}} \times 100\%$$

$$\text{Volume CH}_3\text{COOH} = \frac{3\%}{100\%} \times 100 \text{ ml} = 3 \text{ ml}$$

#### 1.5 Perhitungan Berat Penyusun Membran

Perbandingan % Kitosan % Aliquat 336 : % PVC : % DOP adalah 5 : 0,5 : 34,5 : 60. Sedangkan berat total membran adalah 1 gram sehingga berat masing-masing komponen adalah sebagai berikut :

|                   |                               |
|-------------------|-------------------------------|
| Berat Kitosan     | = 5% x berat total membran    |
|                   | = 5% x 1 gram                 |
|                   | = 0,05 gram                   |
| Berat Aliquat 336 | = % x berat total membran     |
|                   | = 0,5 % x 1 gram              |
|                   | = 0,005 gram                  |
| Berat PVC         | = % PVC x berat total membran |
|                   | = 34,5% x 1 gram              |
|                   | = 0,345 gram                  |
| Berat DOP         | = % DOP x berat total membran |
|                   | = 60% x 1 gram                |
|                   | = 0,60 gram                   |

## LAMPIRAN 2

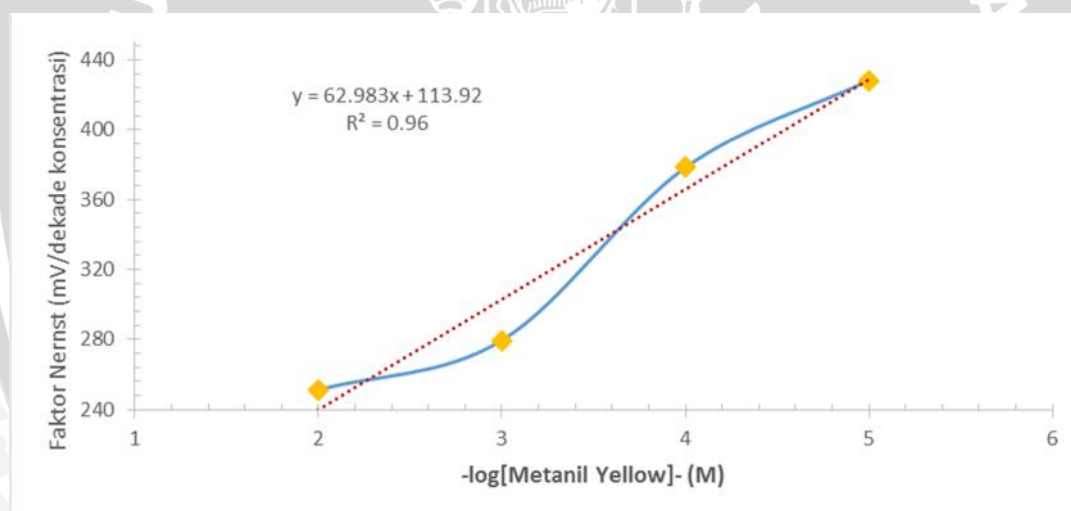
### DATA HASIL PENELITIAN

#### L 2.1 Penentuan Harga Faktor Nernst Terhadap Temperatur

Tabel L.2.1.1 Penentuan Harga Faktor Nernst pada Temperatur 25 °C

| Konsentrasi        | (- log konsentrasi) | Beda Potensial          |       |       | Rata2 Beda Potensial | SD   |
|--------------------|---------------------|-------------------------|-------|-------|----------------------|------|
|                    |                     | I                       | II    | III   |                      |      |
| $1 \times 10^{-5}$ | 5                   | 428.1                   | 428.5 | 428.2 | 428.27               | 0.21 |
| $1 \times 10^{-4}$ | 4                   | 378.1                   | 378.8 | 378.1 | 378.33               | 0.40 |
| $1 \times 10^{-3}$ | 3                   | 279.7                   | 279.4 | 279.7 | 279.60               | 0.17 |
| $1 \times 10^{-2}$ | 2                   | 251.3                   | 251.2 | 251.2 | 251.23               | 0.06 |
| Faktor Nernst      |                     | 62.88                   | 63.13 | 62.94 | 62.98                |      |
| $R^2$              |                     | 0.960                   |       |       |                      |      |
| Linier Respon      |                     | $10^{-5}$ - $10^{-2}$ M |       |       |                      |      |

Harga Faktor Nernst Temperatur 25 °C

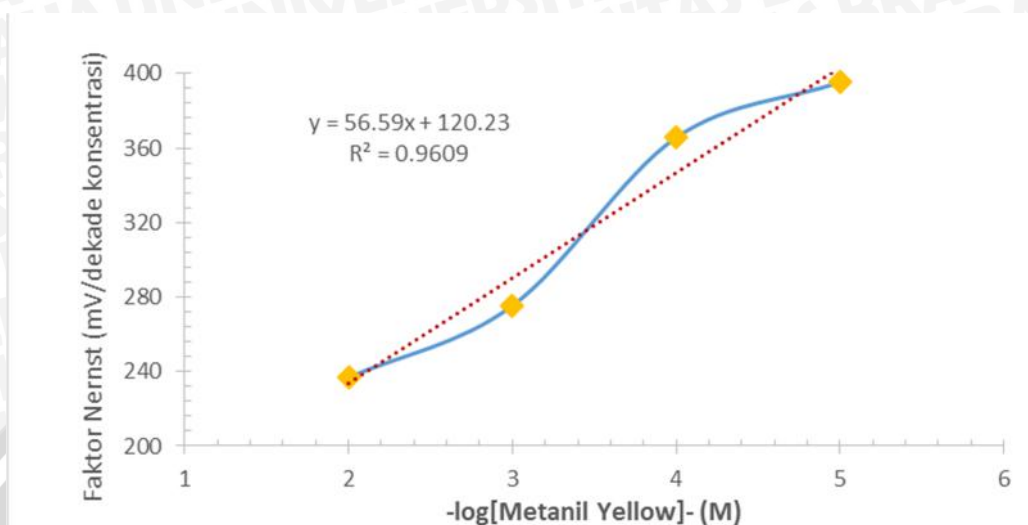


Tabel L.2.1.2 Penentuan Harga Faktor Nernst pada Temperatur 30 °C

| Konsentrasi        | (- log konsentrasi) | Beda Potensial          |       |       | Rata2 Beda Potensial | SD   |
|--------------------|---------------------|-------------------------|-------|-------|----------------------|------|
|                    |                     | I                       | II    | III   |                      |      |
| $1 \times 10^{-5}$ | 5                   | 395.4                   | 395.2 | 395.4 | 395.33               | 0.12 |
| $1 \times 10^{-4}$ | 4                   | 365.7                   | 365.5 | 365.8 | 365.67               | 0.15 |
| $1 \times 10^{-3}$ | 3                   | 275.1                   | 275.9 | 275.1 | 275.37               | 0.46 |
| $1 \times 10^{-2}$ | 2                   | 237.5                   | 236.7 | 236.2 | 236.80               | 0.66 |
| Faktor Nernst      |                     | 56.43                   | 56.51 | 56.83 | 56.59                |      |
| $R^2$              |                     | 0.961                   |       |       |                      |      |
| Konsentrasi Linier |                     | $10^{-5}$ - $10^{-2}$ M |       |       |                      |      |



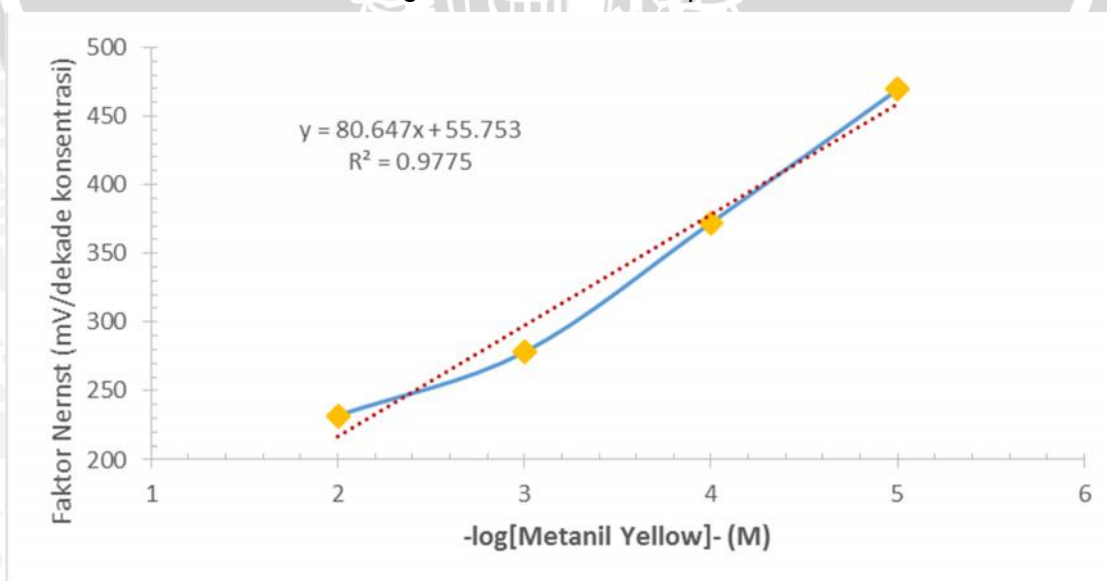
### Harga Faktor Nernst Temperatur 30 °C



Tabel L.2.1.3 Penentuan Harga Faktor Nernst pada Temperatur 35 °C

| Konsentrasi        | (- log konsentrasi) | Beda Potensial                |       |       | Rata2 Beda Potensial | SD   |
|--------------------|---------------------|-------------------------------|-------|-------|----------------------|------|
|                    |                     | I                             | II    | III   |                      |      |
| $1 \times 10^{-5}$ | 5                   | 469.2                         | 469.6 | 469.6 | 469.47               | 0.23 |
| $1 \times 10^{-4}$ | 4                   | 372.1                         | 372.6 | 372.4 | 372.37               | 0.25 |
| $1 \times 10^{-3}$ | 3                   | 277.9                         | 278.4 | 278.3 | 278.20               | 0.26 |
| $1 \times 10^{-2}$ | 2                   | 233.4                         | 231.3 | 231.4 | 232.03               | 1.18 |
| Faktor Nernst      |                     | 80.16                         | 80.91 | 80.87 | 80.65                |      |
| $R^2$              |                     | 0.978                         |       |       |                      |      |
| Konsentrasi Linier |                     | $10^{-5} - 10^{-2} \text{ M}$ |       |       |                      |      |

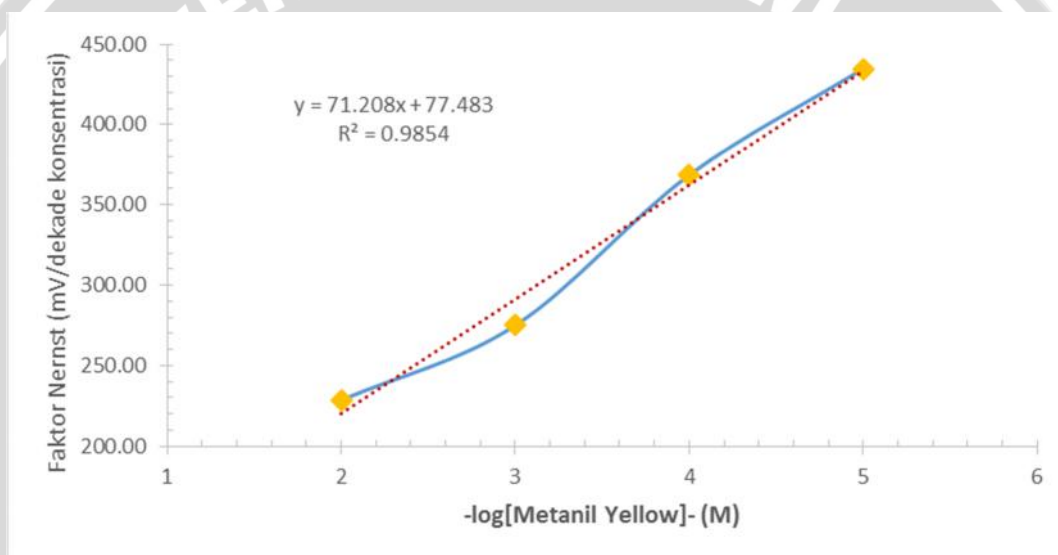
### Harga Faktor Nernst Temperatur 35 °C



**Tabel L.2.1.4 Penentuan Harga Faktor Nernst pada Temperatur 40 °C**

| Konsentrasi        | (- log konsentrasi) | Beda Potensial                |       |       | Rata2 Beda Potensial | SD   |
|--------------------|---------------------|-------------------------------|-------|-------|----------------------|------|
|                    |                     | I                             | II    | III   |                      |      |
| $1 \times 10^{-5}$ | 5                   | 435.2                         | 434.3 | 434.5 | 434.75               | 0.64 |
| $1 \times 10^{-4}$ | 4                   | 368.2                         | 368.7 | 368.7 | 368.53               | 0.29 |
| $1 \times 10^{-3}$ | 3                   | 273.9                         | 276.5 | 274.6 | 275.00               | 1.35 |
| $1 \times 10^{-2}$ | 2                   | 228.7                         | 227.3 | 229.7 | 228.57               | 1.21 |
| Faktor Nernst      |                     | 71.38                         | 71.32 | 70.85 | 71.21                |      |
| $R^2$              |                     | 0.978                         |       |       |                      |      |
| Konsentrasi Linier |                     | $10^{-5} - 10^{-2} \text{ M}$ |       |       |                      |      |

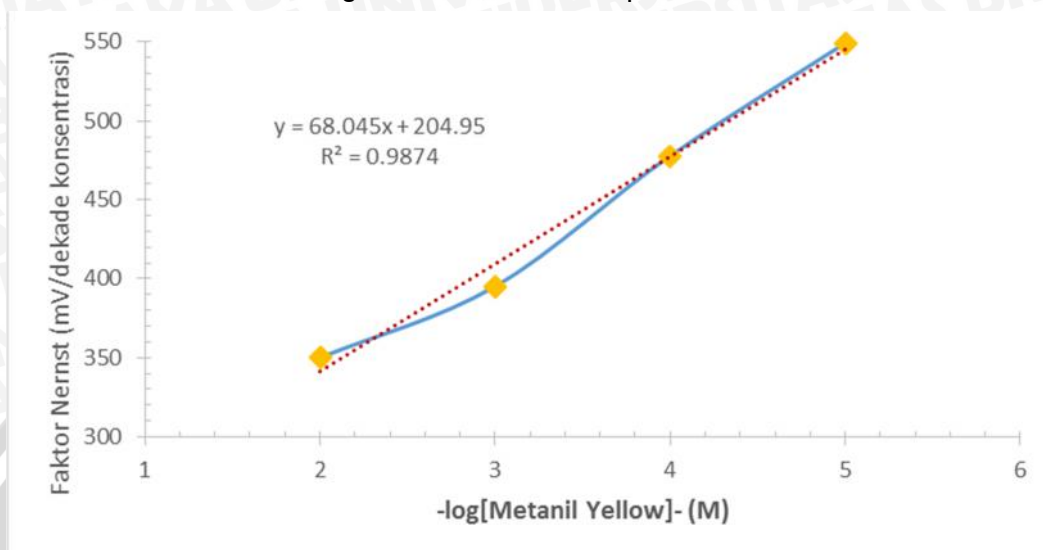
**Harga Faktor Nernst Temperatur 40 °C**



**Tabel L.2.1.5 Penentuan Harga Faktor Nernst pada Temperatur 45 °C**

| Konsentrasi        | (- log konsentrasi) | Beda Potensial                |       |       | Rata2 Beda Potensial | SD   |
|--------------------|---------------------|-------------------------------|-------|-------|----------------------|------|
|                    |                     | I                             | II    | III   |                      |      |
| $1 \times 10^{-5}$ | 5                   | 548.8                         | 549.9 | 549.2 | 549.35               | 0.78 |
| $1 \times 10^{-4}$ | 4                   | 477.4                         | 478.1 | 478.0 | 477.83               | 0.38 |
| $1 \times 10^{-3}$ | 3                   | 395.2                         | 395.0 | 395.2 | 395.13               | 0.12 |
| $1 \times 10^{-2}$ | 2                   | 350.1                         | 349.7 | 350.5 | 350.10               | 0.40 |
| Faktor Nernst      |                     | 67.83                         | 68.37 | 67.89 | 68.05                |      |
| $R^2$              |                     | 0.987                         |       |       |                      |      |
| Konsentrasi Linier |                     | $10^{-5} - 10^{-2} \text{ M}$ |       |       |                      |      |

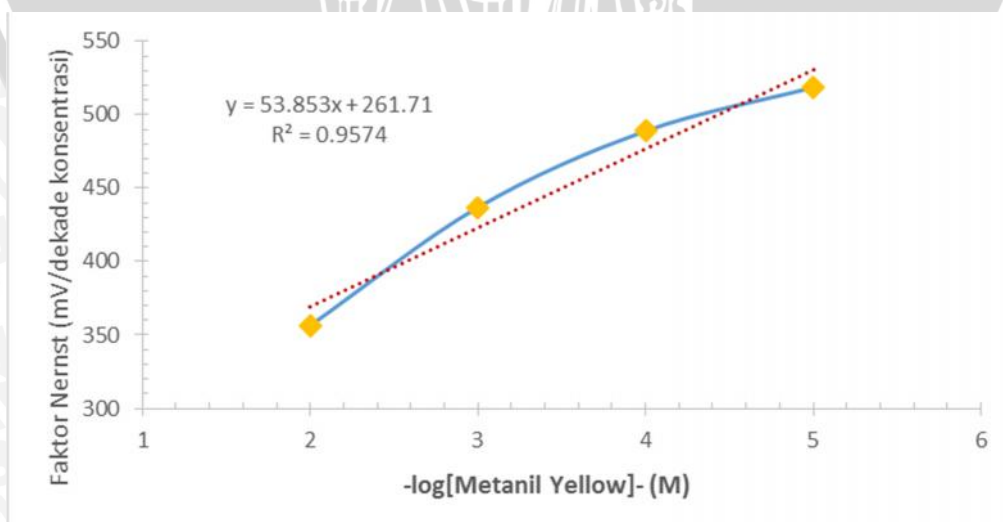
### Harga Faktor Nernst Temperatur 45 °C



**Tabel L.2.1.6 Penentuan Harga Faktor Nernst pada Temperatur 50 °C**

| Konsentrasi        | (- log konsentrasi) | Beda Potensial                |       |       | Rata2 Beda Potensial | SD   |
|--------------------|---------------------|-------------------------------|-------|-------|----------------------|------|
|                    |                     | I                             | II    | III   |                      |      |
| $1 \times 10^{-5}$ | 5                   | 518.8                         | 518.4 | 518.3 | 518.60               | 0.28 |
| $1 \times 10^{-4}$ | 4                   | 488.0                         | 489.9 | 488.8 | 488.90               | 0.95 |
| $1 \times 10^{-3}$ | 3                   | 436.5                         | 437.1 | 437.0 | 436.87               | 0.32 |
| $1 \times 10^{-2}$ | 2                   | 356.3                         | 356.9 | 356.1 | 356.43               | 0.42 |
| Faktor Nernst      |                     | 53.90                         | 53.73 | 53.84 | 53.85                |      |
| $R^2$              |                     | 0.955                         |       |       |                      |      |
| Konsentrasi Linier |                     | $10^{-5} - 10^{-2} \text{ M}$ |       |       |                      |      |

### Harga Faktor Nernst Temperatur 50 °C



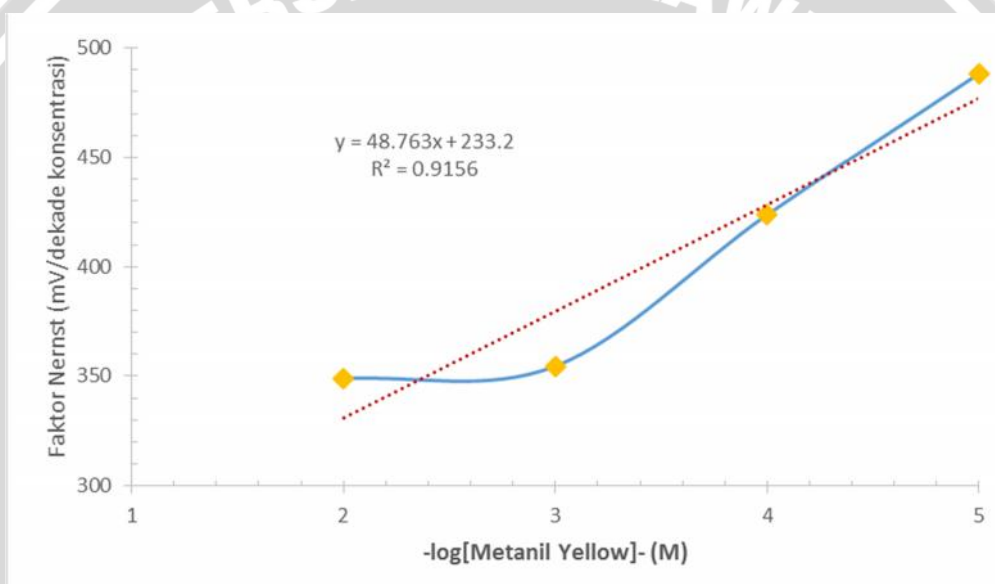


## L 2.2 penentuan Harga Faktor Nernst pada pH 3-8

Tabel L.2.2.1 Penentuan Harga Faktor Nernst pada pH 3

| Konsentrasi        | (- log konsentrasi) | Beda Potensial                |       |       | Rata2 Beda Potensial | SD   |
|--------------------|---------------------|-------------------------------|-------|-------|----------------------|------|
|                    |                     | I                             | II    | III   |                      |      |
| $1 \times 10^{-5}$ | 5                   | 489.2                         | 487.4 | 488.4 | 488.33               | 0.90 |
| $1 \times 10^{-4}$ | 4                   | 423.2                         | 423.5 | 424.5 | 423.73               | 0.68 |
| $1 \times 10^{-3}$ | 3                   | 354.3                         | 354.9 | 354.6 | 354.60               | 0.30 |
| $1 \times 10^{-2}$ | 2                   | 348.2                         | 349.6 | 348.7 | 348.83               | 0.71 |
| Faktor Nernst      |                     | 49.19                         | 48.20 | 48.90 | 48.76                |      |
| $R^2$              |                     | 0.916                         |       |       |                      |      |
| Konsentrasi Linier |                     | $10^{-5} - 10^{-2} \text{ M}$ |       |       |                      |      |

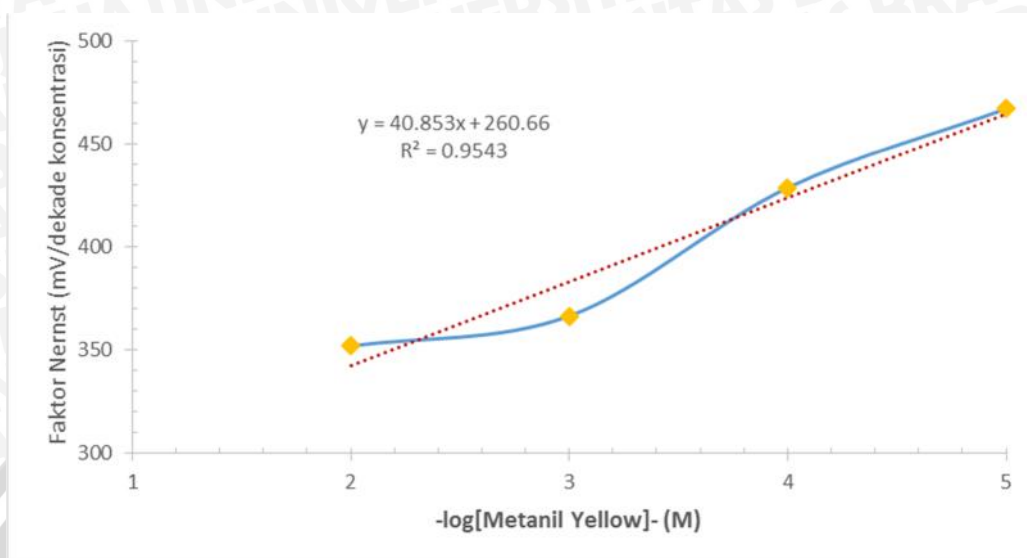
Harga Faktor Nernst pH 3



Tabel L.2.2.2 Penentuan Harga Faktor Nernst pada pH 4

| Konsentrasi        | (- log konsentrasi) | Beda Potensial                |       |       | Rata2 Beda Potensial | SD   |
|--------------------|---------------------|-------------------------------|-------|-------|----------------------|------|
|                    |                     | I                             | II    | III   |                      |      |
| $1 \times 10^{-5}$ | 5                   | 467.5                         | 467.8 | 466.7 | 467.33               | 0.57 |
| $1 \times 10^{-4}$ | 4                   | 428.6                         | 428.5 | 429.4 | 428.83               | 0.49 |
| $1 \times 10^{-3}$ | 3                   | 366.7                         | 366.2 | 366.6 | 366.50               | 0.26 |
| $1 \times 10^{-2}$ | 2                   | 352.8                         | 351.0 | 352.0 | 351.93               | 0.90 |
| Faktor Nernst      |                     | 40.60                         | 41.27 | 40.69 | 40.85                |      |
| $R^2$              |                     | 0.954                         |       |       |                      |      |
| Konsentrasi Linier |                     | $10^{-5} - 10^{-2} \text{ M}$ |       |       |                      |      |

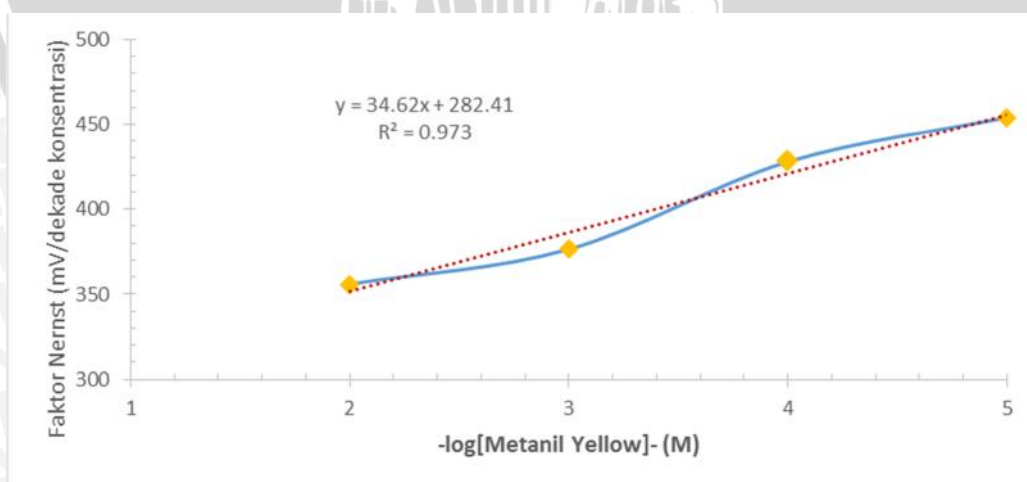
### Harga Faktor Nernst pH 4



Tabel L.2.2.3 Penentuan Harga Faktor Nernst pada pH 5

| Konsentrasi        | (- log konsentrasi) | Beda Potensial                |       |       | Rata2 Beda Potensial | SD   |
|--------------------|---------------------|-------------------------------|-------|-------|----------------------|------|
|                    |                     | I                             | II    | III   |                      |      |
| $1 \times 10^{-5}$ | 5                   | 453.7                         | 454.0 | 454.7 | 454.13               | 0.62 |
| $1 \times 10^{-4}$ | 4                   | 428.6                         | 427.4 | 427.7 | 427.90               | 0.46 |
| $1 \times 10^{-3}$ | 3                   | 376.9                         | 376.3 | 376.0 | 376.40               | 0.61 |
| $1 \times 10^{-2}$ | 2                   | 356.2                         | 356.3 | 355.2 | 355.90               | 0.35 |
| Faktor Nernst      |                     | 34.42                         | 34.42 | 35.02 | 34.62                |      |
| $R^2$              |                     | 0.973                         |       |       |                      |      |
| Konsentrasi Linier |                     | $10^{-5} - 10^{-2} \text{ M}$ |       |       |                      |      |

### Harga Faktor Nernst pH 5

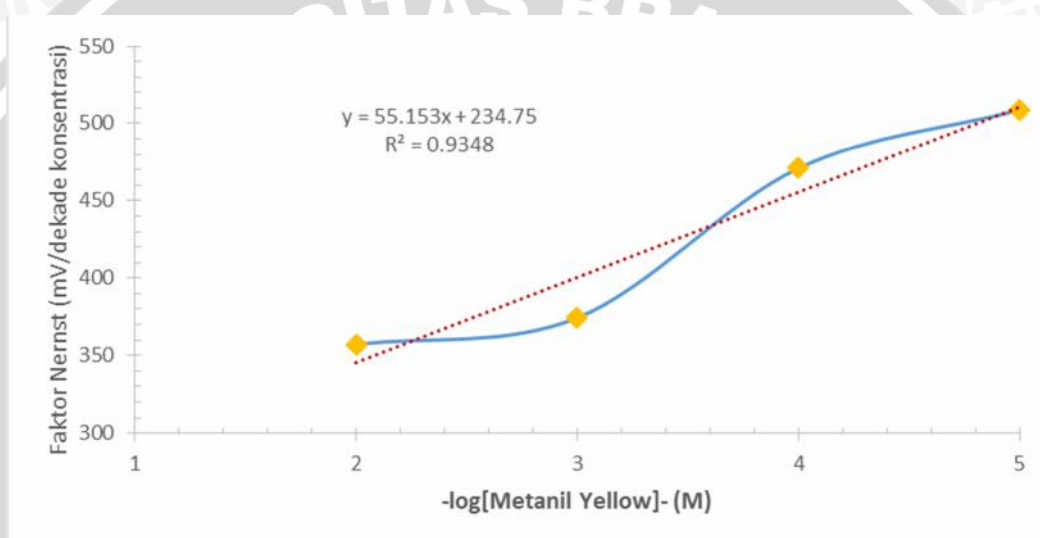




**Tabel L.2.2.4 Penentuan Harga Faktor Nernst pada pH 6**

| Konsentrasi        | (- log konsentrasi) | Beda Potensial        |       |       | Rata2 Beda Potensial | SD   |
|--------------------|---------------------|-----------------------|-------|-------|----------------------|------|
|                    |                     | I                     | II    | III   |                      |      |
| $1 \times 10^{-5}$ | 5                   | 509.6                 | 509.0 | 507.6 | 508.73               | 0.86 |
| $1 \times 10^{-4}$ | 4                   | 470.2                 | 470.8 | 471.9 | 470.97               | 0.95 |
| $1 \times 10^{-3}$ | 3                   | 375.4                 | 373.6 | 374.0 | 374.33               | 1.05 |
| $1 \times 10^{-2}$ | 2                   | 358.2                 | 356.1 | 357.0 | 357.10               | 0.38 |
| Faktor Nernst      |                     | 54.90                 | 55.59 | 54.97 | 55.15                |      |
| $R^2$              |                     | 0.935                 |       |       |                      |      |
| Konsentrasi Linier |                     | $10^{-5} - 10^{-2}$ M |       |       |                      |      |

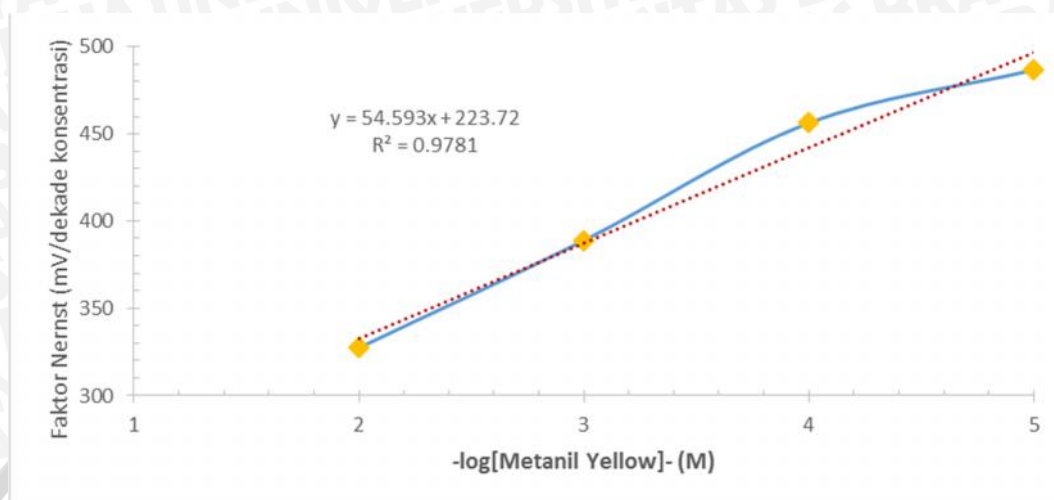
**Harga Faktor Nernst pH 6**



**Tabel L.2.2.5 Penentuan Harga Faktor Nernst pada pH 7**

| Konsentrasi        | (- log konsentrasi) | Beda Potensial        |       |       | Rata2 Beda Potensial | SD   |
|--------------------|---------------------|-----------------------|-------|-------|----------------------|------|
|                    |                     | I                     | II    | III   |                      |      |
| $1 \times 10^{-5}$ | 5                   | 487.3                 | 487.0 | 486.0 | 486.77               | 0.29 |
| $1 \times 10^{-4}$ | 4                   | 456.5                 | 456.0 | 456.5 | 456.33               | 0.80 |
| $1 \times 10^{-3}$ | 3                   | 389.6                 | 388.0 | 388.8 | 388.80               | 0.20 |
| $1 \times 10^{-2}$ | 2                   | 327.3                 | 327.5 | 327.1 | 327.30               | 0.13 |
| Faktor Nernst      |                     | 54.69                 | 54.65 | 54.44 | 54.59                |      |
| $R^2$              |                     | 0.978                 |       |       |                      |      |
| Konsentrasi Linier |                     | $10^{-5} - 10^{-2}$ M |       |       |                      |      |

### Harga Faktor Nernst pH 7



**Tabel L.2.2.6 Penentuan Harga Faktor Nernst pada pH 8**

| Konsentrasi        | (- log konsentrasi) | Beda Potensial                |       |       | Rata2 Beda Potensial | SD   |
|--------------------|---------------------|-------------------------------|-------|-------|----------------------|------|
|                    |                     | I                             | II    | III   |                      |      |
| $1 \times 10^{-5}$ | 5                   | 581.4                         | 581.2 | 581.3 | 581.30               | 0.55 |
| $1 \times 10^{-4}$ | 4                   | 501.6                         | 502.1 | 501.0 | 501.57               | 0.59 |
| $1 \times 10^{-3}$ | 3                   | 382.1                         | 381.2 | 382.3 | 381.87               | 0.23 |
| $1 \times 10^{-2}$ | 2                   | 356.8                         | 356.4 | 356.8 | 356.67               | 0.16 |
| Faktor Nernst      |                     | 79.33                         | 79.53 | 79.22 | 79.36                |      |
| $R^2$              |                     | 0.950                         |       |       |                      |      |
| Konsentrasi Linier |                     | $10^{-5} - 10^{-2} \text{ M}$ |       |       |                      |      |

### Harga Faktor Nernst pH 8

