

LAMPIRAN A
DATA PERCOBAAN

Tabel A. Data konsentrasi kesetimbangan hasil analisa AAS

Konsentrasi Awal, Co (ppm)	Konsentrasi Kesetimbangan, Ce (ppm)			Daya Jerap, Qe (mg/g)		
	30 °C	40 °C	50 °C	30 °C	40 °C	50 °C
40	7,70	9,40	10,08	6,46	6,12	5,84
50	11,60	12,50	14,55	7,68	7,50	7,09
60	15,45	20,05	21,49	8,91	7,99	7,70

LAMPIRAN B

CONTOH PERHITUNGAN

1. Menghitung Daya Jerap (Q_e)

- konsentrasi setimbang (C_e) = 7,70 ppm
- konsentrasi awal (C_o) = 40 ppm
- massa adsorben = 5 gram

$$Q_e = \frac{C_o - C_e}{\text{massa adsorben}}$$

$$= \frac{40 - 7,70}{5}$$

$$= 6,46 \text{ mg Zn}^{2+}/\text{g kaolin}$$

2. Menghitung Konstanta model Langmuir

$$Q_e = \frac{Q_o K C_e}{1 + K C_e}$$

$$\frac{1}{Q_e} = \frac{1 + K C_e}{Q_o K C_e}$$

$$\frac{1}{Q_e} = \frac{1}{Q_o K} \frac{1}{C_e} + \frac{1}{Q_o}$$

dari kurva diperoleh persamaan garis lurus dengan slope $\frac{1}{Q_o K}$ dan intercept

$\frac{1}{Q_o}$, maka harga $K = \text{intercept/slope}$. Persamaan grafik $y = 0,7964x + 0,0556$

Slope = 0,7964 ; intercept = 0,055 ; $Q_o = 1/0,0556 = 17,9856$

$$K = \frac{0,0556}{0,7964} = 0,0698$$

3. Menghitung Konstanta model Freundlich

$$Q_e = K C_e^{1/n}$$

$$\log Q_e = \log K + \frac{1}{n} \log C_e$$

dari kurva $\log Q_e$ vs $\log C_e$ diperoleh persamaan garis lurus; slope $\frac{1}{n}$ dan

intercept $\log K$. Persamaan grafik $y = 0,4446x + 0,4233$; $n = \frac{1}{0,4446} = 2,249$

$$\text{intercept} = \log K = 0,4233 = 2,6503$$

4. Menghitung Konstanta model BET

$$Q_e = \frac{Q_o K \frac{C_e}{C_o}}{\left(1 - \frac{C_e}{C_o}\right) \left[1 + (K-1) \frac{C_e}{C_o}\right]}$$

$$\frac{C_e / C_o}{Q_e \left(1 - \frac{C_e}{C_o}\right)} = \left[1 + (K-1) \frac{C_e}{C_o}\right] \frac{1}{Q_o K}$$

$$\frac{C_e / C_o}{Q_e \left(1 - \frac{C_e}{C_o}\right)} = \left[\frac{1}{Q_o K} + \frac{K-1}{Q_o K} \frac{C_e}{C_o}\right]$$

dari kurva $\frac{C_e / C_o}{Q_e \left(1 - \frac{C_e}{C_o}\right)}$ vs $\frac{C_e}{C_o}$; slope $\frac{K-1}{Q_o K}$; intercept $\frac{1}{Q_o K}$

$$K = (\text{slope}/\text{intercept}) + 1$$

Persamaan grafik $y = 0,0501x + 0,0256$; slope = 0,0501 ; intercept = 0,0257

$$K = (0,0501/0,0256) + 1 = 2,9570 ; \text{dimana } Q_o = 13,210$$

5. Perhitungan Model Langmuir

$$Q_{eL} = \frac{Q_o K C_e}{1 + K C_e} \text{ diketahui: } Q_o = 17,9856; K = 0,0698; C_e = 7,68$$

$$= \frac{17,9856 \times 0,0698 \times 7,68}{1 + (0,0698 \times 7,68)}$$

$$= 6,2775 \text{ mg Zn}^{2+}/\text{g kaolin}$$

6. Perhitungan Model Freudlich

$$Q_{eF} = K C_e^{1/n} ; \text{diketahui: } K = 2,6503; C_e = 7,68; 1/n = 0,4446$$

$$= 2,6503 \times 7,68^{0,4446}$$

$$= 6,5603 \text{ mg Zn}^{2+}/\text{g kaolin}$$

7. Perhitungan Model BET

$$Q_{e \text{ BET}} = \frac{Q_o K \frac{C_e}{C_o}}{\left(1 - \frac{C_e}{C_o}\right) \left[1 + (K-1) \frac{C_e}{C_o}\right]}$$

Diketahui: $Q_0 = 13,210$; $C_e = 7,68$; $K = 2,957$; $C_0 = 40$

$$Q_e \text{ BET} = \frac{13,210 \times 2,957 \frac{7,68}{40}}{\left(1 - \frac{7,68}{40}\right) \left[1 + (2,957 - 1) \frac{7,68}{40}\right]}$$
$$= 6,7470 \text{ mg Zn}^{2+}/\text{g kaolin}$$

8. Perhitungan ΔH :

$$K = K_0 \exp [-\Delta H/RT]$$

$$\ln k = \ln K_0 + [-\Delta H/R \cdot 1/T]$$

Persamaan grafik $y = 2098,1x - 5,9293$; dengan $R = 1,987 \text{ cal/mol } ^\circ\text{K}$

$$-\Delta H/R = 2098,1$$

$$\Delta H = -4168,92 \text{ cal/mol } ^\circ\text{K} = -4,1689 \text{ kcal/mol } ^\circ\text{K}$$