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Matakul : Kimia Pemisahan Analitik

3. Diketahui : % E = 99,9%

$$V_o = 50 \text{ ml}$$

$$V_a = 50 \text{ ml}$$

$$n = 5$$

$$W_A = 100\% - 99,9\%$$

$$= \frac{0,1\%}{100} \times 1 \text{ gram}$$

$$= 0,001 \text{ gram}$$

Jawab :

$$W_A = W_o \left(\frac{V_a}{V_a + k_D \cdot V_o} \right)^n$$

$$0,001 \text{ gr} = 1 \text{ gr} \left(\frac{50 \text{ ml}}{50 \text{ ml} + 50 \text{ ml} \cdot k_D} \right)^5$$

$$\left(0,001 \text{ gr} = 1 \text{ gr} \left(\frac{1}{1 + k_D} \right)^5 \right)^{1/5}$$

$$(0,001 \text{ gr})^{1/5} = \left(\frac{1}{1 + k_D} \right)^1$$

$$0,2511 (1 + k_D) = 1$$

$$0,2511 + 0,2511 k_D = 1$$

$$0,2511 k_D = 1 - 0,2511$$

$$0,2511 k_D = 0,7489$$

$$k_D = 2,98$$

$$k_D = 3$$

3.2

Diketahui : % E = 90 %

$$V_a = 100 \text{ mL}$$

$$V_o = 90 \text{ mL}$$

$$n = 5$$

$$W_o = 1 \text{ gram}$$

$$W_a = 100\% - 90\%$$

$$= 10\% \times 1 \text{ gr}$$

$$= 0,1 \text{ gr}$$

Jawab :

$$\left[W_a = W_o \left(\frac{V_a}{V_a + V_o k_D} \right)^n \right] \times \frac{1}{n}$$

$$W_o = 1 \text{ gram}$$

$$(W_a)^{1/n} = 1 \left(\frac{V_a}{V_a + V_o k_D} \right)$$

$$(V_a + V_o k_D) = \frac{V_a}{W_a^{1/n}}$$

$$k_D = \frac{\left(\frac{V_a}{W_a^{1/n}} - V_a \right)}{V_o}$$

$$\% E = 90\% \rightarrow k_D = \frac{\frac{100}{0,1^{1/5}} - 100}{90}$$

$$k_D = \frac{\frac{100}{0,631} - 100}{90}$$

$$k_D = \frac{158,47 - 100}{90}$$

$$k_D = 0,64966$$

% E untuk 10 kali

$$(100\% - x\%) \text{ gr} = 0,01 \text{ gr}$$

$$\frac{100}{100} - x\% = 0,01 \text{ gr}$$

$$x\% = 1 - 0,01 \text{ gr}$$

$$x\% = 0,99 \rightarrow x = 99\%$$