

3-1

Dik :

$$\% E = 99,9\%$$

$$V_0 = 50 \text{ ml}$$

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

$$n = 5$$

$$W_A = 100\% - 99,9\% = \frac{0,1\%}{100} \times 1 \text{ gram} = 0,001 \text{ gr}$$

jawab =

$$W_A = W_0 \left(\frac{V_a}{V_a + K_D \cdot V_0} \right)^n$$

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

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

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

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

$$0,2511 + 0,2511 K_D = 1$$

$$0,2511 K_D = 1 - 0,2511$$

$$0,2511 K_D = 0,7489$$

$$K_D = 2,98 \approx 3$$

3-2

$$\text{Dik: } \%E = 90\%$$

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

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

$$n = 5$$

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

$$W_a = 100\% - 90\% = 10\% \times 1 \text{ gr} = 0,1 \text{ gr}$$

jawab :

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

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

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

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

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

$$\%E = 90\%$$

$$\hookrightarrow k_D = \frac{\frac{100}{0,115} - 100}{90}$$

$$k_D = \frac{\frac{100}{0,1691} - 100}{90}$$

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

$$k_D = 0,64966$$

% E untuk 10 kali

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

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

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

$$x\% = 0,99$$

$$x = 99\%$$