

(B2-2)

$$(1) -V_A = k C_A$$

$$(i) \tau_{i2} \frac{V_i}{u_0} = \int_{C_0}^{C_i} \frac{dC_A}{-r_A} = -\frac{1}{k} \ln \frac{C_i}{C_0} = \frac{1}{k} \ln \frac{C_0}{C_i}$$

$$\therefore \frac{C_i}{C_0} = \frac{1}{e^{\tau_{i2} k}} \quad \frac{C_2}{C_0} = \frac{C_2}{C_1} \times \frac{C_1}{C_0} = \frac{1}{e^{\tau_{1k} + \tau_{2k}}}$$

$$\therefore C_i = C_0 \exp\left[-\frac{k}{u_0}(V_1 + \dots + V_i)\right] \quad C_F = C_0 \exp\left[-\frac{k}{u_0}(V_1 + \dots + V_N)\right]$$

$$(ii) \tau_{k2} = \frac{0.0003}{0.001} = 0.3$$

$$C_F = C_0(1-x) \quad x = \left(-\frac{C_F}{C_0}\right) = 1 - e^{-2 \times 0.3} = \underline{0.45}$$

$$(2) \tau_{i2} = \frac{V_i}{u_0} = \frac{KV_i}{u_0}$$

$$\therefore C_i = C_0 \exp\left(-kN \frac{V_i}{u_0}\right) \quad C_F = C_0 \exp\left(-kN \frac{V_N}{u_0}\right)$$

$$(iii) (1)-(ii) \text{ と同じ計算が } x = \underline{0.45}$$

$$(iii) \frac{C_F}{C_0} \leq 0.15 \text{ とすればいい}$$

$$\exp\left(-kN \frac{V}{u_0}\right) \leq 0.15$$

$$-kN \frac{V}{u_0} \leq \ln 0.15$$

$$N \geq \frac{u_0}{kV} \ln \frac{100}{15} = 6.3$$

$$\therefore \underline{7 \text{ 個}}$$