

B2-1

(a) Langmuir

(b) 希薄な溶液では $(k \ll 1 \text{ 等})$ $1 + kC \approx 1$.

$$q = q_s k C \text{ は Henry の法則と同形}$$

(c) q [mol/kg] は全体の物質の量

$$C_0 V = C_1 V + q \cdot m \text{ 故に } q = \frac{C_0 - C_1}{m} V$$

$$(d) q = q_s k C_1 = \frac{C_0 - C_1}{m} V$$

$$= \frac{C_0}{m} V - \frac{C_1}{m} V$$

$$C_1 \left(q_s k + \frac{V}{m} \right) = \frac{C_0}{m} V$$

$$\text{よって } C_1 = \frac{\frac{V}{m} C_0}{q_s k + \frac{V}{m}} = \frac{C_0}{q_s k \frac{m}{V} + 1}$$

$$(e) q = q_s k C_2 = \frac{C_1 - C_2}{m} V$$

$$C_2 = \frac{C_1}{q_s k \frac{m}{V} + 1} = \left(\frac{1}{q_s k \frac{m}{V} + 1} \right)^2 C_0$$