

A3

$$1) p_1^{vap} = \alpha p_2^{vap} \quad \&#246; \quad \alpha = \frac{p_1^{vap}}{p_2^{vap}}$$

$$2) y = \frac{\alpha x}{1 + (\alpha - 1)x} \quad \&#246; \quad \&#246;$$

$$\frac{dL}{L} = \frac{dx}{y - \alpha} = \frac{\alpha dx}{\frac{\alpha x}{1 + (\alpha - 1)x} - \alpha} = \frac{1 + (\alpha - 1)x}{(\alpha - 1)x(1 - x)} dx$$

$$= \left\{ \frac{1}{(\alpha - 1)x(1 - x)} + \frac{1}{(1 - x)} \right\} dx$$

$$= \left\{ \frac{1}{\alpha - 1} \left( \frac{1}{1 - x} + \frac{1}{x} \right) + \frac{1}{1 - x} \right\} dx$$

$$= \frac{1}{\alpha - 1} \left( \frac{\alpha}{1 - x} + \frac{1}{x} \right) dx$$

この積分は

$$\ln [L]_{L_0}^{L_1} = \frac{1}{\alpha - 1} \left\{ \ln [x]_{x_0}^{x_1} - \alpha \ln [1 - x]_{x_0}^{x_1} \right\}$$

$$= \frac{1}{\alpha - 1} \left\{ \ln \frac{x_1}{x_0} - \alpha \ln \frac{1 - x_1}{1 - x_0} \right\}$$

$$= \frac{1}{1 - \alpha} \left\{ \ln \frac{x_0}{x_1} + \alpha \ln \frac{1 - x_1}{1 - x_0} \right\}$$

$$\&#246; \quad \ln \frac{L_0}{L_1} = \frac{1}{\alpha - 1} \left\{ \ln \frac{x_0}{x_1} + \alpha \ln \frac{1 - x_1}{1 - x_0} \right\}$$

$$3) x_1 = 0.1, x_0 = 0.4, \alpha = 2.49 \quad \&#246; \quad \&#246;$$

$$(c) \alpha \frac{L_0}{L_1} = 1.608 \quad \&#246; \quad \frac{L_0}{L_1} = 5, \quad \&#246; \quad L_1 = \frac{L_0}{5} = \frac{20 \text{ mol}}{5}$$

$$(d) D = L - L_1 = 100 - 20 = 80 \text{ mol}$$

$$(e) n = \dot{v} = 42 \text{ 区}$$

$$100 \times 0.4 = D x_D + L_1 x_1 \\ = 80 x_D + 20 \times 0.1$$

$$\&#246; \quad x_D = \frac{40 - 2}{80} = \frac{38}{80} = 0.475 \quad \frac{47.5}{100} \%$$