

2021

B2-2

$$F = 3\pi\mu r D_p \omega \quad \text{適用} = \underline{\text{Stokes}}$$

$$z = \frac{r\omega^2}{g} \quad \text{遠心効果}$$

$$\frac{dr_p}{dt} = \frac{v_g \omega^2}{g} r_p$$

$$\frac{dr_p}{r_p} = \frac{v_g \omega^2}{g} dt$$

$$\ln \frac{r_2}{r_1} = \frac{v_g \omega^2}{g} t$$

$$t = \frac{g}{v_g \omega^2} \ln \frac{r_2}{r_1}$$

$$v_g = \frac{D_p^2 (\rho_p - \rho_f) g}{18\mu_f} = 2.11 \times 10^{-4} \text{ m/s}$$

$$\omega = \frac{2\pi}{T} \times N = \underline{523.6 \text{ rad/s}}$$

$$t = \frac{g}{v_g \omega^2} \times \ln \frac{r_2}{r_1} = \underline{117.7 \text{ s}}$$

$$v \times t < H \quad \text{す)} \quad \text{す)}$$

$$\omega = \frac{H}{t} = \frac{1}{117.7} = 8.50 \times 10^{-3} \text{ r/s}$$

$$\Theta = A \cdot \omega$$

$$= \frac{\pi}{4} (r_2^2 - r_1^2) \cdot \omega = \underline{2.00 \times 10^{-4} \text{ m}^3/\text{s}}$$