四. 浮力

$$F_{浮} = F_下 - F_上 = \rho g \underline{\Delta h \cdot S} = \rho g V_{排}$$

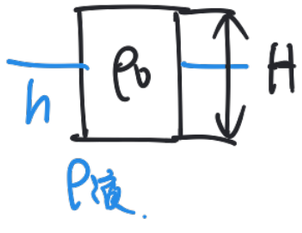
上下表面液体压力差

漂浮 $F_{浮} = G$

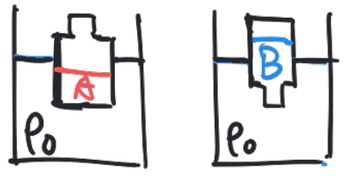
$$\rho_{液} g V_{排} = \rho_0 g V$$

$$\rho_{液} g S \cdot h = \rho_0 g S \cdot H$$

$$\frac{h}{H} = \frac{\rho_0}{\rho_{液}}$$



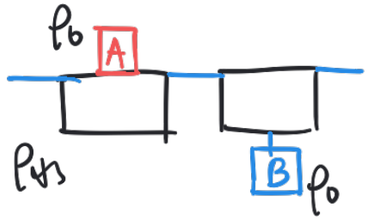
☆ 蜡烛问题



液面低，密度大

$\rho_A > \rho_0 \quad \rho_0 > \rho_B$

正反无影响

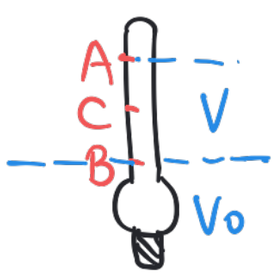


$$(m_B - m_A) g = F_{浮B}$$

$$m_B - m_A = \rho_物 \frac{m_B}{\rho_0}$$

$$m_B = \frac{\rho_0}{\rho_0 - \rho_物} m_A$$

密度计 { 上小下大 / 上疏下密 不均匀



$$\begin{cases} \rho_A \cdot (V_0 + V) = m \\ \rho_B \cdot V_0 = m \\ \rho_C \cdot (V_0 + \frac{V}{2}) = m \end{cases}$$

中点C, $\rho_C = \frac{2\rho_A \rho_B}{\rho_A + \rho_B}$

拓展，液面升降

$$\Delta h = \frac{\Delta V_{排}}{S_容}$$

$$\Delta p_{液} = \rho g \Delta h$$

柱，$\Delta F_{液} = \Delta p_{液} \cdot S = \rho g \Delta h \cdot S = \rho g \Delta V_{排} = \Delta F_{浮}$

柱，$F_{液} = G_{液} + F_{浮}$

浮力为液体对物体作用力即为增加的液体压力