

Exp 3: Density of liquids

Fluids → gases
liquids

• exert forces on the walls of their containers (perpendicular to the surface)

pressure →
• $P = \frac{F \rightarrow \text{force}}{A \rightarrow \text{area}}$

• a portion of liquid:

$$P_2 A - mg - P_1 A = 0$$

$$A(P_2 - P_1) = mg$$

$$(P_2 - P_1) = \frac{mg}{A}$$

$$P = \frac{m}{V}$$

$$m = A \cdot V$$

$$P_2 - P_1 = \frac{P \cdot V}{A} g$$

$$P_2 - P_1 = \frac{P A (h_2 - h_1)}{A} g$$

$$P_2 - P_1 = (h_2 - h_1) \rho g$$

• U-Tube:

$$1 - P_B - P_A = h_2 \times \rho_2 \times g$$

$$2 - P_D - P_C = h_1 \times \rho_1 \times g \quad \left\{ \begin{matrix} P_B = P_D \\ P_A = P_C \end{matrix} \right.$$

$$h_2 \rho_2 g = h_1 \rho_1 g$$

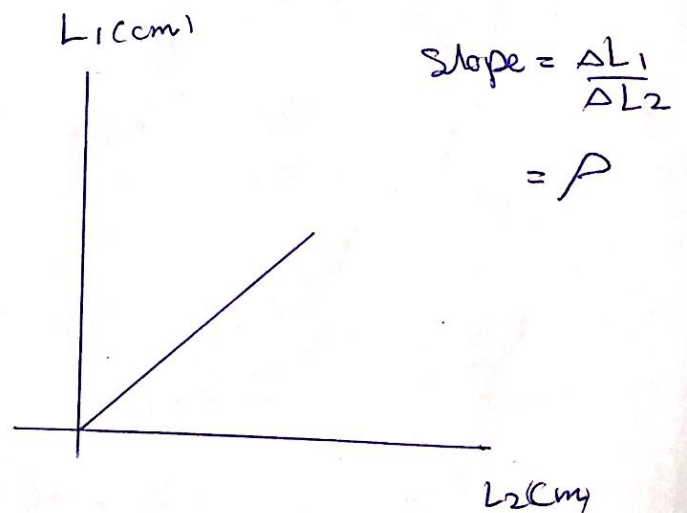
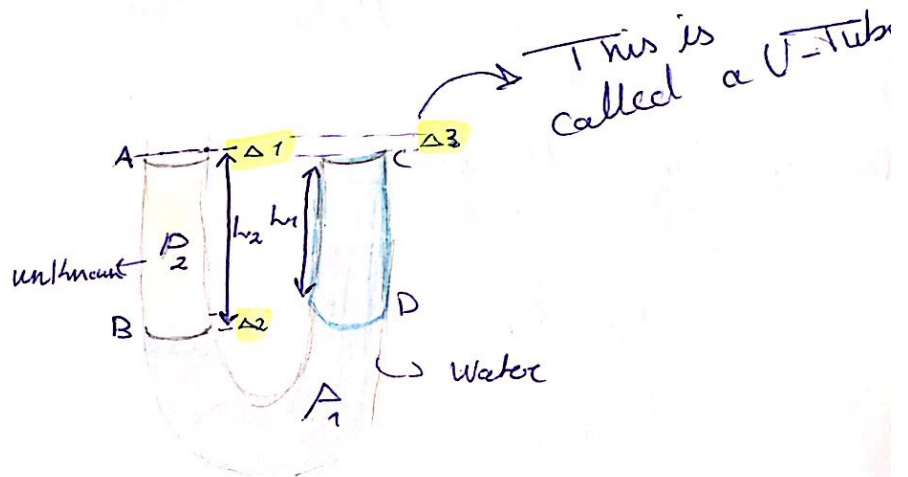
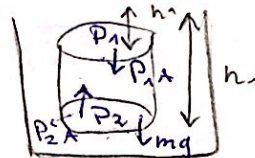
$$h_2 \rho_2 g = h_1 g$$

$$\rho_2 = \frac{h_1}{h_2}$$

$$\frac{\Delta P}{\rho} = \frac{\Delta h_1}{h_1} + \frac{\Delta h_2}{h_2}$$

→ $\Delta 1 + \Delta 2$

→ $\Delta 2 + \Delta 3$



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