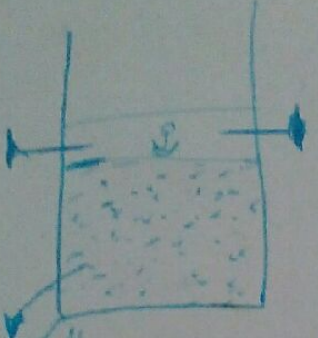


$$\Delta U_{\text{isobar}} = \frac{\gamma}{\gamma - 1} n R \Delta T = \frac{\gamma}{\gamma - 1} \Delta(pV)$$

$$\Delta U_{\text{isobar}} = \frac{\gamma}{\gamma - 1} n R \Delta T = \frac{\gamma}{\gamma - 1} \Delta(pV)$$

همه چیزها

فراستوسفیر



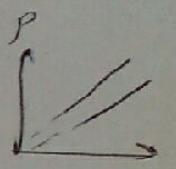
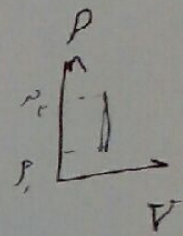
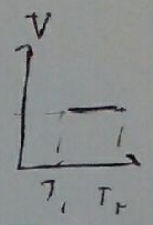
$$W = -p \Delta V$$

$$W = -\Delta$$

$$Q_V = n C_V \Delta T = \frac{\gamma}{\gamma - 1} n R \Delta T$$

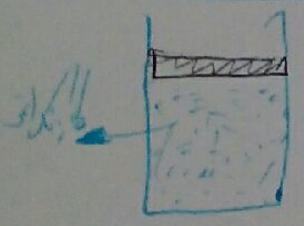
$$\Delta U = Q_V + W = \frac{\gamma}{\gamma - 1} n R \Delta T$$

$$pV = nRT$$



$$p = n \frac{RT}{V}$$

- ایزوترم: $C_V = \frac{\gamma}{\gamma - 1} R$
- ایزوبار: $C_V = \frac{\gamma}{\gamma - 1} R$
- ایزوکور: $C_V = \frac{\gamma}{\gamma - 1} R$

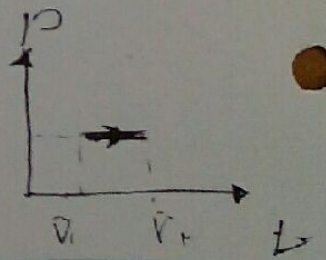
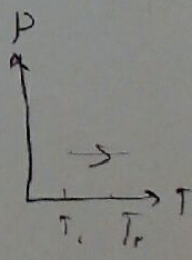
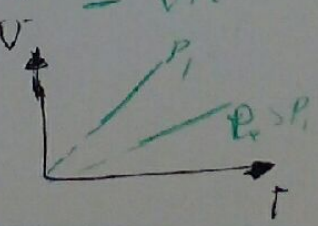


$$W = -p \Delta V = -n R \Delta T \equiv -\Delta n$$

$$Q_p = n C_p R \Delta T = \frac{\gamma}{\gamma - 1} n R \Delta T \equiv \Delta n$$

$$\Delta U = \frac{\gamma}{\gamma - 1} n R \Delta T \equiv \Delta n$$

$$|Q| > |\Delta U| > |W|$$



- ایزوترم: $\frac{\gamma}{\gamma - 1} R$
- ایزوبار: $\frac{\gamma}{\gamma - 1} R$
- ایزوکور: $\frac{\gamma}{\gamma - 1} R$

همه چیزها

$$\Delta T = 0 \Rightarrow W = -Q$$

~~$$W = -Q$$~~

همه چیزها

$$W = -p \Delta V$$

$$Q = 0$$

$$\Delta U = W$$

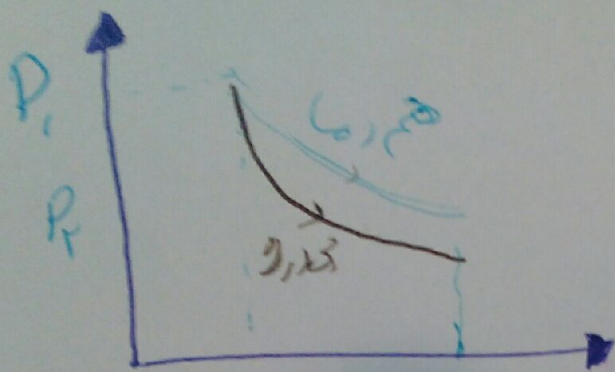
دستگاه ← عایق کاری
= بسته

همه چیزها

همه چیزها
↓ pV = nRT
ΔU = ...

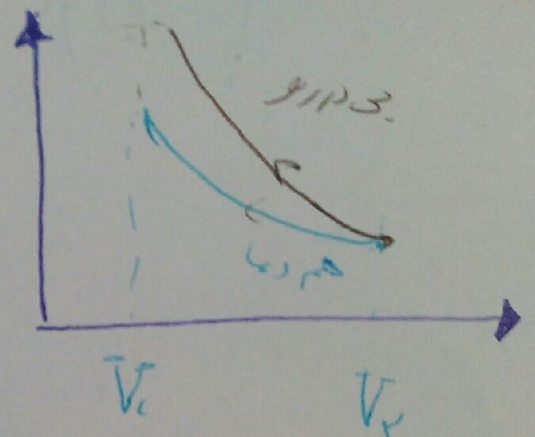
$$\Delta U = \frac{\gamma}{\gamma - 1} n R \Delta T = \frac{\gamma}{\gamma - 1} \Delta(pV) = \frac{\gamma}{\gamma - 1} (p_c V_c - p_i V_i)$$

$$\Delta U = \frac{\gamma}{\gamma - 1} n R \Delta T = \frac{\gamma}{\gamma - 1} \Delta(pV)$$



$\downarrow U^{\text{co}}$ ~~↑~~ \downarrow level

$$\downarrow P \quad \uparrow V = nRT \quad \downarrow$$



$\uparrow U^{\text{co}}$ ~~↓~~ \uparrow level

$$\uparrow P \quad \downarrow V = nRT \quad \uparrow$$