

Ex. 12.4

Isovolumetric process
|
same $W=0$

if $W = -P\Delta V$

if no ΔV , $W=0$

$$W = -P\Delta V$$

U inside

Q heat

$$m = 2 \text{ kg}$$

$$Q = 10 \text{ kJ flame}$$

$$\frac{Q = -2 \text{ kJ}}{8 \text{ kJ} = 8000 \text{ J}}$$
$$\Delta T = ?$$

$$\Delta U = Q + 0$$

$$Q = mc\Delta T$$

$$\Delta T = \frac{Q}{mc}$$

$$= \frac{8000 \text{ J}}{(2 \text{ kg}) 4.186 \times 10^3 \frac{\text{J}}{\text{kg}\cdot^\circ\text{C}}}$$

$$= 0.96^\circ\text{C}$$

$$\text{specific heat } Q = mc\Delta T$$

↑ ↑ ↑
mass spec. °C
kg heat capacity
J
kg·°C

$$C_{\text{H}_2\text{O}} = 4.186 \times 10^3 \frac{\text{J}}{\text{kg}\cdot^\circ\text{C}}$$