

$$q_{xn} = n \text{ moles}_{rxn} \cdot \Delta H_{rxn} \quad 0 = q_{xn} + q_{cal}$$

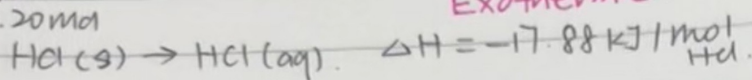
$$q_{cal} = m C_s \Delta T$$

$$q_{xn} = -q_{cal}$$

$$C_s = \frac{J(\text{Energy})}{g(\text{mass}) \cdot \Delta T}$$

e.g.1:

0.20 mol



Exothermic.

$$q_{xn} = n \text{ moles}_{rxn} \cdot \Delta H_{rxn}$$

$$= 0.20 \text{ mol} \times (-17.88 \text{ kJ/mol}_{\text{HCl}})$$

$$= -3.576 \text{ kJ}$$

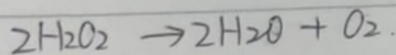
$$q_{xn} = -q_{cal}$$

$$q_{cal} = 3.576 \text{ kJ}$$

$$q_{cal} = m C_s \Delta T$$

$$\Delta T = \frac{m C_s}{q_{cal}} = \frac{500 \text{ g} \times 4.184 \text{ J/gK}}{3.576 \text{ kJ}} = 1.709 \text{ K} = 1.7 \text{ K} \quad \text{sig fig}$$

e.g.2:



$$\Delta T = 72 \text{ K}$$

$$C_{cal} = 400. \text{ J/K}$$

$$q_{cal} = \Delta T \cdot C_{cal} = -q_{xn} = 28800 \text{ J}; \quad q_{xn} = -28800 \text{ J}$$

$$\Delta H_{rxn} = \frac{q_{xn}}{n \text{ moles}_{rxn}} = \frac{-28800 \text{ J}}{10.0 \text{ g} \times \frac{1 \text{ mol}}{34.0 \text{ g}} \times 2}$$