

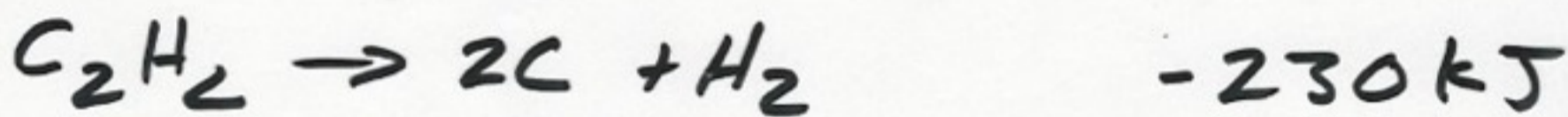
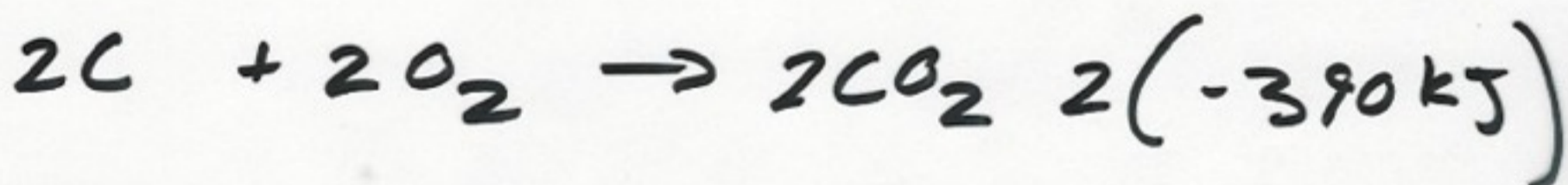
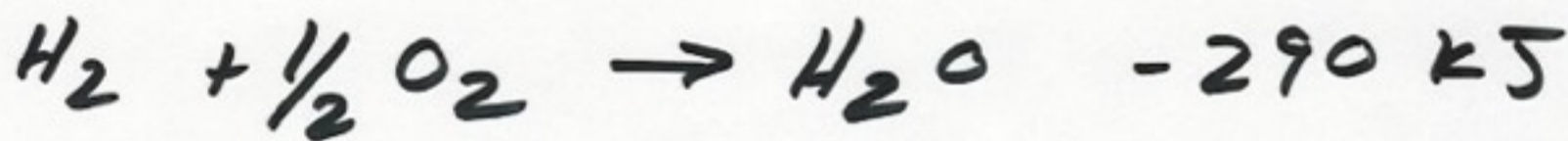
1

$$\Delta E = q + w$$

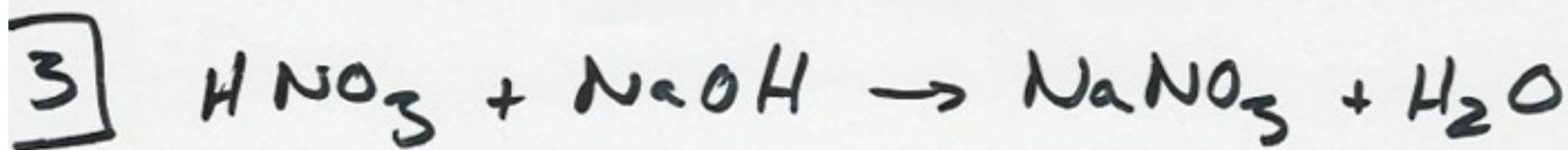
$$= 89 \text{ kJ} + -111 \text{ kJ}$$

$$= -22 \text{ kJ}$$

2



$$\Delta H = -1300 \text{ kJ}$$



$$0.1\text{L} \times \frac{0.5\text{ mol HNO}_3}{1\text{L}} = 0.05\text{ mol HNO}_3$$

$$q = mc\Delta T$$

$$200\text{ml} \times \frac{1\text{g}}{1\text{ml}} = 200\text{g solution}$$

$$= (200\text{g}) \left(\frac{4.18\text{ J}}{\text{g}^\circ\text{C}} \right) (28.1^\circ\text{C} - 22.5^\circ\text{C})$$

$$= -4681\text{ J} \times \frac{1\text{ kJ}}{1000\text{ J}} = -4.681\text{ kJ}$$

$$\frac{-4.68\text{ kJ}}{0.05\text{ mol HNO}_3} = -93.6\text{ kJ}$$

