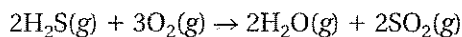


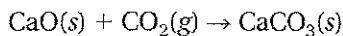
4. Calculate the amount of heat needed to convert 96 g of ice at -24°C to water at 28°C . The specific heat capacity of $\text{H}_2\text{O}(s)$ is $2.1 \text{ J/g}\cdot^{\circ}\text{C}$.

SECTION 17.4 CALCULATING HEATS OF REACTION

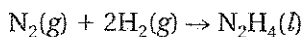
1. What is the standard heat of reaction for the combustion of hydrogen sulfide? Refer to Table 17.4 in your textbook.



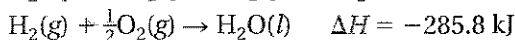
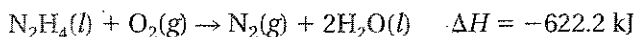
2. Calculate the enthalpy change (in kJ) for the following reaction. State whether the reaction is exothermic or endothermic. Refer to Table 17.4 in your textbook.



3. What is the enthalpy change for the formation of hydrazine, $\text{N}_2\text{H}_4(l)$, from its elements?



Use the following reactions and enthalpy changes:



1. ΔH_f° (products)

$$\left(2 \text{ mol SO}_2(g) \times \frac{-296.8 \text{ kJ}}{1 \text{ mol SO}_2(g)} \right) + \left(2 \text{ mol H}_2\text{O}(g) \times \frac{-241.8 \text{ kJ}}{1 \text{ mol H}_2\text{O}(g)} \right)$$

$$= -593.6 \text{ kJ} + (-483.6 \text{ kJ})$$

$$= -1077 \text{ kJ}$$

ΔH_f° (reactants)

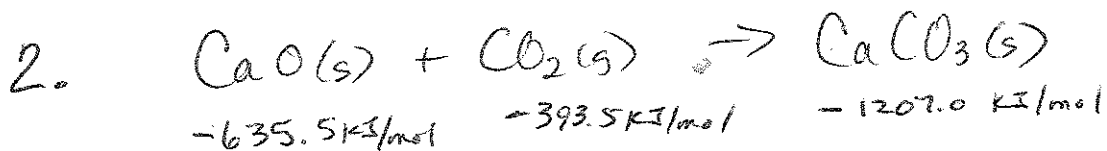
$$2 \text{ mol H}_2\text{S}(g) \times \frac{-20.1 \text{ kJ}}{1 \text{ mol H}_2\text{S}(g)} + 0 \text{ kJ}$$

$$= -40.2 \text{ kJ}$$

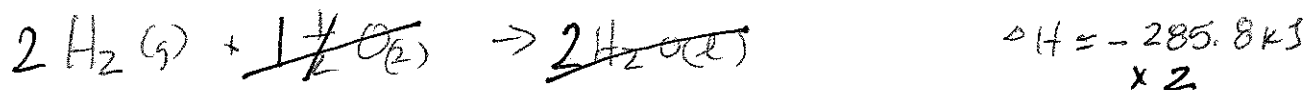
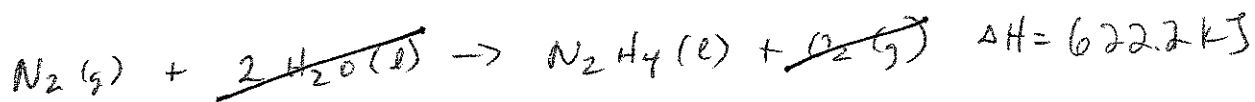
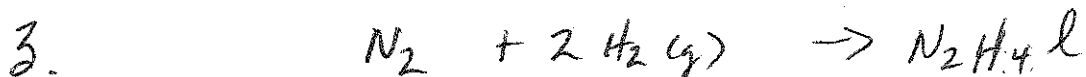
$$\Delta H_r^{\circ} = \Delta H_f^{\circ}(\text{products}) - \Delta H_f^{\circ}(\text{reactant})$$

$$= -1077 \text{ kJ} - (-40.2 \text{ kJ})$$

$$= -1036.8 \text{ kJ} \quad 1.04 \times 10^3 \text{ kJ}$$



$$\begin{aligned} \Delta H_f^\circ &= \Delta H_f^\circ(\text{products}) - \Delta H_f^\circ(\text{reactants}) \\ &= -1207.0 \text{ kJ} - (-635.5 \text{ kJ} + -393.5 \text{ kJ}) \\ &= -1207.0 \text{ kJ} - (-1029 \text{ kJ}) \\ &= -178 \text{ kJ} \quad \text{exothermic} \end{aligned}$$



$$\begin{aligned} \Delta H &= 622.2 \text{ kJ} + (-571.6 \text{ kJ}) \\ \Delta &= 50.6 \text{ kJ} \end{aligned}$$

