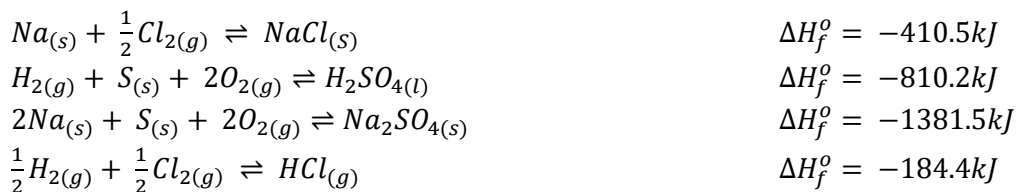
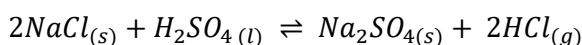


Hess's Law Problems

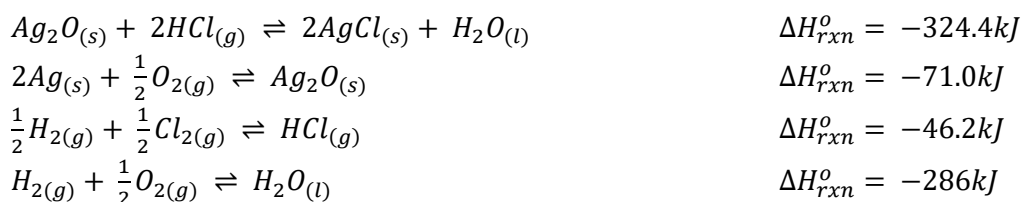
1. The enthalpies of the following reactions are given



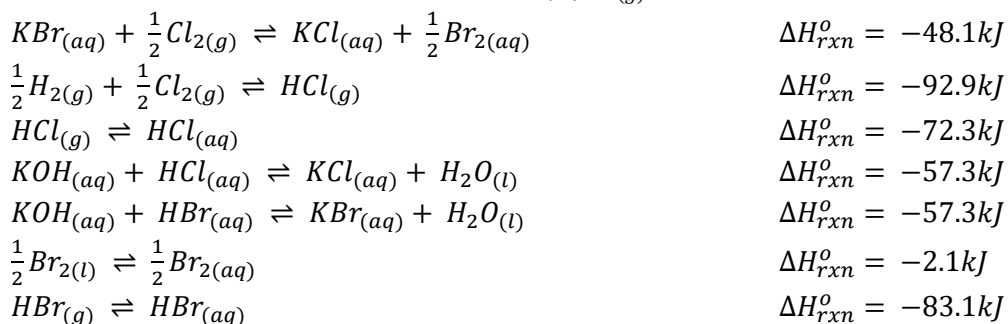
From the above data and equations, calculate ΔH_{rxn}° for the following reaction:



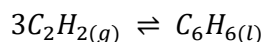
2. From the following data, calculate the standard heat of formation of $\text{AgCl}_{(s)}$:



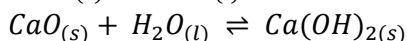
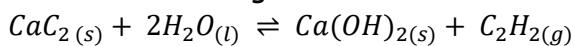
3. Use the following data to determine $\Delta H_f^\circ(\text{HBr}_{(g)})$:



4. The enthalpy of combustion for $\text{C}_2\text{H}_2(g)$ is $-1298.3 \frac{\text{kJ}}{\text{mol}}$ and for $\text{C}_6\text{H}_6(l)$ the enthalpy of combustion is $-3264.6 \frac{\text{kJ}}{\text{mol}}$. The complete combustion of any organic compound containing carbon, hydrogen and possibly oxygen involves the reaction of that substance with $\text{O}_2(g)$ to produce $\text{CO}_2(g)$ and $\text{H}_2\text{O}(g)$. Calculate the enthalpy of reaction for the following reaction:



5. Given the following data:



$$\Delta H_{\text{rxn}}^{\circ} = -129.58 \text{ kJ}$$

$$\Delta H_{\text{rxn}}^{\circ} = -62.7 \text{ kJ}$$

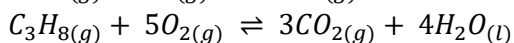
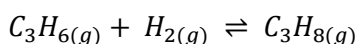
$$\Delta H_f^{\circ}(\text{CaC}_2(\text{s})) = -59.787 \text{ kJ}$$

$$\Delta H_f^{\circ}(\text{CaO}(\text{s})) = -635.5 \text{ kJ}$$

$$\Delta H_f^{\circ}(\text{H}_2\text{O}(\text{l})) = -286 \text{ kJ}$$

Calculate ΔH_f° for $\text{C}_2\text{H}_2(\text{g})$

6. Given the following data:



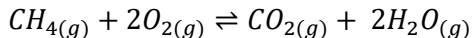
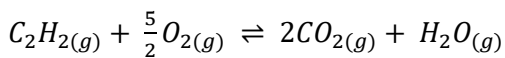
$$\Delta H_{\text{rxn}}^{\circ} = -123.7 \text{ kJ}$$

$$\Delta H_{\text{rxn}}^{\circ} = -2218 \text{ kJ}$$

$$\Delta H_f^{\circ}(\text{H}_2\text{O}(\text{l})) = -286 \text{ kJ}$$

Calculate the heat of combustion of propene: $\text{C}_3\text{H}_6(\text{g})$

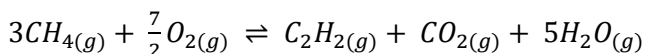
7. Given the reactions



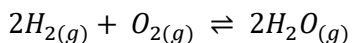
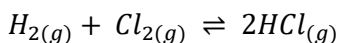
$$\Delta H_{\text{rxn}}^{\circ} = -1304.2 \text{ kJ}$$

$$\Delta H_{\text{rxn}}^{\circ} = -882.0 \text{ kJ}$$

Calculate $\Delta H_{\text{rxn}}^{\circ}$ for :



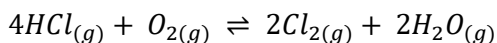
8. Given the reactions:



$$\Delta H_{\text{rxn}}^{\circ} = -184.8 \text{ kJ}$$

$$\Delta H_{\text{rxn}}^{\circ} = -572.0 \text{ kJ}$$

Calculate $\Delta H_{\text{rxn}}^{\circ}$ for :



ANSWERS

$$1. \Delta H_{\text{rxn}}^{\circ} = -119.1 \text{ kJ}$$

$$2. \Delta H_f^{\circ} = -100.9 \frac{\text{kJ}}{\text{mol}}$$

$$3. \Delta H_f^{\circ} = -36.1 \frac{\text{kJ}}{\text{mol}}$$

$$4. \Delta H_{\text{rxn}}^{\circ} = -630.3 \frac{\text{kJ}}{\text{mol}}$$

$$5. \Delta H_f^{\circ} = -223 \frac{\text{kJ}}{\text{mol}}$$

$$6. \Delta H_{\text{rxn}}^{\circ} = -2056 \frac{\text{kJ}}{\text{mol}}$$

$$7. \Delta H_{\text{rxn}}^{\circ} = -1342 \frac{\text{kJ}}{\text{mol}}$$

$$8. \Delta H_{\text{rxn}}^{\circ} = -202.4 \text{ kJ}$$