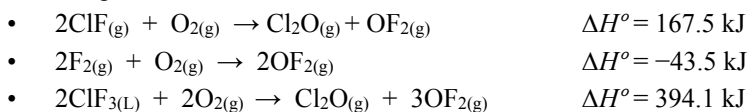
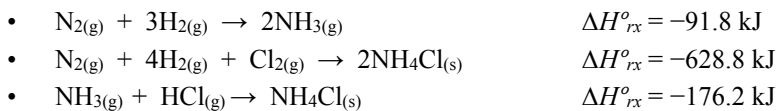


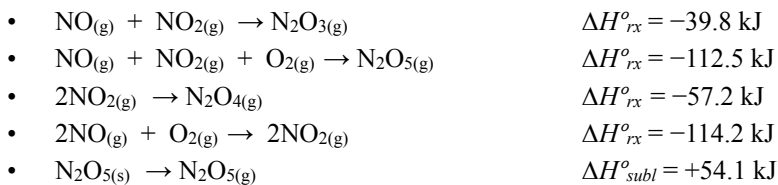
1. Oxidation of ClF by F₂ yields liquid ClF₃. Use the following thermochemical equations to apply Hess' Law and calculate ΔH_{rx}° for the production of ClF₃.



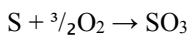
2. Use the following information to find ΔH_f° of gaseous HCl.



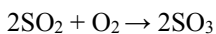
3. The chemistry of nitrogen oxides is very versatile. Given the following reactions and their standard enthalpy changes, calculate the heat of reaction for $\text{N}_2\text{O}_{3(g)} + \text{N}_2\text{O}_{5(s)} \rightarrow 2\text{N}_2\text{O}_{4(g)}$



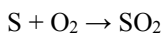
4. Given the following data:



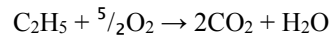
$$\Delta H^\circ = -395 \text{ kJ}$$



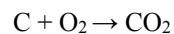
$$\Delta H^\circ = -198 \text{ kJ}$$

calculate ΔH° for the reaction:

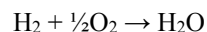
7. Given the following data:



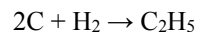
$$\Delta H^\circ = -1300 \text{ kJ}$$



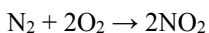
$$\Delta H^\circ = -394 \text{ kJ}$$



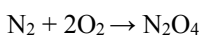
$$\Delta H^\circ = -286 \text{ kJ}$$

calculate ΔH° for the reaction:

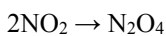
5. Given the following data:



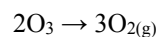
$$\Delta H^\circ = 68 \text{ kJ}$$



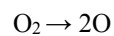
$$\Delta H^\circ = 10. \text{ kJ}$$

calculate ΔH° for the reaction:

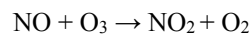
8. Given the following data:



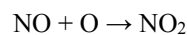
$$\Delta H^\circ = -427 \text{ kJ}$$



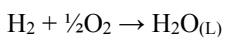
$$\Delta H^\circ = 495 \text{ kJ}$$



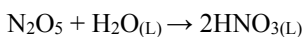
$$\Delta H^\circ = -199 \text{ kJ}$$

calculate ΔH° for the reaction:

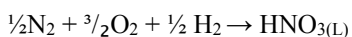
6. Given the following data:



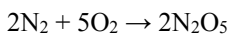
$$\Delta H^\circ = -286 \text{ kJ}$$



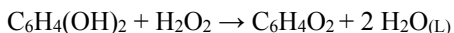
$$\Delta H^\circ = -77 \text{ kJ}$$



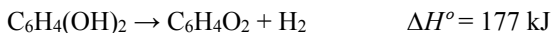
$$\Delta H^\circ = -174 \text{ kJ}$$

calculate ΔH° for the reaction:

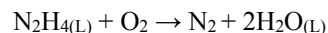
9. The bombardier beetle uses an explosive discharge as a defensive measure. The chemical reaction involved is the oxidation of hydroquinone by hydrogen peroxide to produce quinone and water:



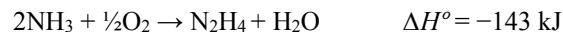
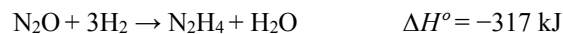
Calculate ΔH° for this reaction from the following data.



11. Calculate ΔH° for this reaction



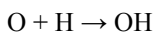
Given the following data.



10. Given the following data:



calculate ΔH° for the reaction:



ANSWERS

- $\Delta H_{\text{Rx}} = -135.05 \text{ kJ mol}^{-1}$ of ClF_3
- $\Delta H_{\text{Rx}} = -92.3 \text{ kJ mol}^{-1}$ of HCl
- $\Delta H_{\text{Rx}} = -22.2 \text{ kJ mol}^{-1}$ of $\text{N}_2\text{O}_3(\text{g})$ reacted
- $\Delta H_{\text{Rx}} = -296 \text{ kJ mol}^{-1}$ of SO_2 produced
- $\Delta H = -58 \text{ kJ mol}^{-1}$ of N_2O_4 produced
- $\Delta H = +30 \text{ kJ}$ per 2 mol N_2O_5 produced
- $\Delta H = +226 \text{ kJ mol}^{-1}$ of C_2H_5 produced
- $\Delta H = -233 \text{ kJ mol}^{-1}$ of NO_2 produced
- $\Delta H = -204 \text{ kJ mol}^{-1}$ of $\text{C}_6\text{H}_4\text{O}_2$ produced
- $\Delta H = -427 \text{ kJ mol}^{-1}$ of OH produced
- $\Delta H = -623 \text{ kJ mol}^{-1}$ N_2O_5 reacted