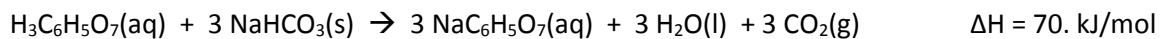


Enthalpy Stoichiometry Practice

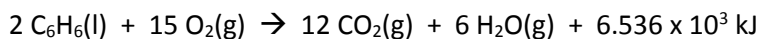
1. Citric acid reacts with sodium bicarbonate according to the balanced equation below.



- a. Calculate the quantity of heat, in joules, absorbed when 5.00 grams of sodium bicarbonate reacts with excess citric acid.

- b. Calculate the grams of carbon dioxide produced when 300. kJ of heat are absorbed.

2. The combustion of benzene, $\text{C}_6\text{H}_6(\text{l})$, in oxygen liberates heat according to the balanced equation below.



- a. Is the reaction endothermic or exothermic? Explain your reasoning.

- b. What is the value of ΔH ?

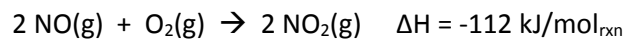
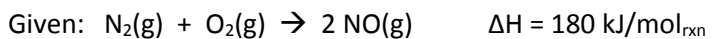
- c. Draw the potential energy diagram for this reaction.

- d. Calculate the quantity of heat released when 10.00 g of benzene is burned in excess oxygen.

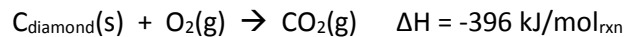
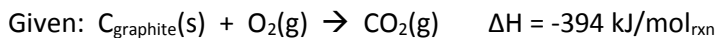
- e. How many grams of benzene must be burned to evolve 1.00 kJ of heat?

Hess's Law

1. Calculate ΔH for the reaction: $\text{N}_2(\text{g}) + 2 \text{O}_2(\text{g}) \rightarrow 2 \text{NO}_2(\text{g})$.



2. Calculate ΔH for the reaction: $\text{C}_{\text{graphite}}(\text{s}) \rightarrow \text{C}_{\text{diamond}}(\text{s})$



3. Calculate ΔH for the reaction: $2 \text{H}_3\text{BO}_3(\text{aq}) \rightarrow \text{B}_2\text{O}_3(\text{s}) + 3 \text{H}_2\text{O}(\text{l})$

