

Worksheet: Energy

Key

1. In the reaction of one mole of carbon with oxygen gas, the energy of the carbon dioxide product is 393 kJ lower than the energy of the reactants.

a. Is the reaction exothermic or endothermic?

product energy lower than reactants \therefore exothermic

b. Write the equation for the reaction, including the heat of the reaction.



c. What is the value, in kilojoules, of the ΔH for this reaction?

$$\Delta H = -393 \text{ kJ}$$

negative ΔH because exothermic

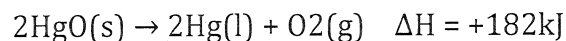
2. In the formation of two moles of ammonia, NH_3 , from hydrogen and nitrogen, 92.2 kJ of heat is released.



How much heat, in kilojoules, is released when 50.0g of ammonia is produced?

$$50.0 \text{ g NH}_3 \times \frac{1 \text{ mol NH}_3}{17.03 \text{ g NH}_3} \times \frac{92.2 \text{ kJ}}{2 \text{ mol NH}_3} = \boxed{135 \text{ kJ of heat are produced}}$$

3. Mercury (II) oxide decomposes to mercury and oxygen.



a. Is the reaction endothermic or exothermic? endothermic

b. How many kilojoules are needed to react 25.0g of mercury (II) oxide?

$$25.0 \text{ g HgO} \times \frac{1 \text{ mol HgO}}{216.6 \text{ g HgO}} \times \frac{182 \text{ kJ}}{2 \text{ mol HgO}} = \boxed{10.5 \text{ kJ needed to react}}$$