Chemistry 11 – Energy in Chemical Reactions

1. State whether each of the following are ***exothermic*** or ***endothermic***. (7 marks)

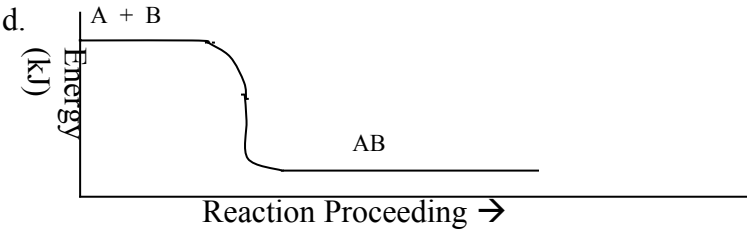
   a. **H + Cl → HCl + 432 kJ** Answer _____

   b. **$12CO_2$ + $11H_2O$ → $C_{12}H_{22}O_{11}$ + $12\ O_2$ $\Delta H = 5638$ kJ**

   Answer _____

   c. **$H_2O_{(s)}$ → $H_2O_{(l)}$** Answer _____

   d.



   Answer _____

   e. **C + D → CD $\Delta H = -65.7$ kJ** Answer _____

   f. **E + F + 437 kJ → G + H** Answer _____

   g. **$H_2O_{(g)}$ → $H_2O_{(l)}$** Answer _____

2. Draw an "Energy" vs. "Reaction Proceeding" graph for the reaction:
   CO_2 → C + O_2 $\Delta H = 393$ kJ/mol. Label ΔH on your graph. (2 marks)

3. In an ***endothermic*** reaction, the surroundings get (*warmer/cooler*) (1mark) _____.

4. Define ***enthalpy*** (1 mark)

5. Given the equation: **HCl + 432 kJ → H + Cl**

   How much heat is absorbed when 5.5 moles of HCl is decomposed into its atoms? (1 mark)

   Answer _____

6. Given the equation: **$C_{12}H_{22}O_{11}$ + 12 O_2 → 12 CO_2 + 11 H_2O + 5638 kJ**

   a. How much heat is released during the formation of one mole of CO_2? (1 mark)

   Answer _____

   b. How much heat is released during the formation of 2.2 moles of H_2O? (1 marks)

   Answer _____

   c. If 9.0 moles of O_2 are consumed, how much heat is released? (1 marks)

   Answer _____