Mr. Bracken
AP Chemistry

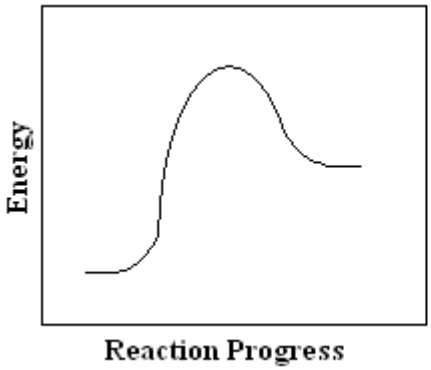
Name _____
Period _____

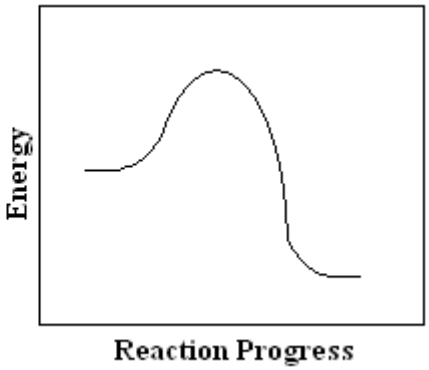
Thermochemistry: Enthalpy Worksheet
Revised 2009

1. Consider the following reaction, which occurs at room temperature and pressure:

$$2\ Cl\ (g) \rightarrow Cl_2\ (g) \qquad \Delta H^o = -243.4\ kJ$$

(a) Which reaction profile shown below corresponds to this chemical reaction?





Explain your reasoning.

(b) Which has the higher enthalpy under these conditions, 2Cl (g) or Cl_2 (g) ? Explain.

(c) Is this reaction endothermic or exothermic? Explain your reasoning.

2. When solutions containing silver ions and chloride ions are mixed, silver chloride precipitates.

$$Ag^{1+}\,(aq) + Cl^{1-}\,(aq) \rightarrow AgCl\,(s) \qquad \Delta H^o = -65.5\ kJ$$

(a) Calculate ΔH^o for the formation of 0.540 moles of AgCl from this reaction.

(b) Calculate ΔH^o for the formation of 1.66 grams of AgCl.

(c) Now, consider the reverse reaction where solid AgCl dissolves in water. Calculate ΔH^o if 0.000188 moles of **solid** AgCl dissolves in water.

3. Consider the following reaction:

$$Mg\,(s) + \tfrac{1}{2}\,O_2\,(g) \rightarrow MgO\,(s) \qquad \Delta H^o = -602\ kJ$$

(a) Calculate the amount of heat transferred when 2.43 g of Mg(s) reacts at constant pressure.

(b) How many grams of MgO are produced during an enthalpy change of –301 kJ?

(c) How many kilojoules of heat are absorbed when 7.50 g of MgO(s) is decomposed into Mg(s) and O_2 (g) at constant pressure?