Chemistry 141 Name key

Dr. Cary Willard

Quiz 6A (20 points) March 17, 2009

1. (12 points) 2.91 g of isooctane (C8H18) were placed into a calorimeter containing 200 g of water at 28.4 oC and burned in the presence of oxygen. After the completion of the reaction, 21.5 g of the water had been evaporated. The calorimeter constant for the calorimeter was 0.423 kJ/oC, for water specific heat = 4.184 J/goC and ΔH vaporization = 2260 J/g.
   1. What is the final temperature of the system?

100oC

* 1. What is the q of the reaction (remember sign conventions)

* 1. What is the q of the reaction in kJ/g
  2. What is the ΔH of the reaction in kJ/mol?

1. (8 points)Calculate ΔHrxn for 2 NOCl(g) 🡪 N2(g) + O2(g) + Cl2(g) using Hess’s Law.

Given the following equations

½ N2(g) + ½ O2(g) 🡪 NO(g) ΔH = + 90.3 kJ

NO(g) + ½ Cl2(g) 🡪 NOCl(g) ΔH = −38.6 kJ

2 NOCl(g) 🡪 2 NO(g) + Cl2(g) −-2(−38.6 kJ) = + 77.2 kJ

2 NO 🡪 N2(g) + O2(g) −2(+90.3 kJ) = −180.6 kJ

2 NOCl(g) 🡪 N2(g) + O2(g) + Cl2(g) −103.4 kJ

Chemistry 141 Name key

Dr. Cary Willard

Quiz 6B (20 points) March 17, 2009

1. (12 points) 4.49 g of isooctane (C8H18) were placed into a calorimeter containing 300 g of water at 28.4 oC and burned in the presence of oxygen. After the completion of the reaction, 41.5 g of the water had been evaporated. The calorimeter constant for the calorimeter was 0.423 kJ/oC, for water specific heat = 4.184 J/goC and ΔH vaporization = 2260 J/g.
   1. What is the final temperature of the system?

100oC

* 1. What is the q of the reaction (remember sign conventions)

* 1. What is the q of the reaction in kJ/g
  2. What is the ΔH of the reaction in kJ/mol?

1. (8 points)Calculate ΔHrxn for 2 NOCl(g) 🡪 N2(g) + O2(g) + Cl2(g) using Hess’s Law.

Given the following equations

½ N2(g) + ½ O2(g) 🡪 NO(g) ΔH = + 90.3 kJ

NO(g) + ½ Cl2(g) 🡪 NOCl(g) ΔH = −38.6 kJ

2 NOCl(g) 🡪 2 NO(g) + Cl2(g) −-2(−38.6 kJ) = + 77.2 kJ

2 NO 🡪 N2(g) + O2(g) −2(+90.3 kJ) = −180.6 kJ

2 NOCl(g) 🡪 N2(g) + O2(g) + Cl2(g) −103.4 kJ