Chemistry 221 Oregon State University Worksheet 7

1. A student dissolves 13.13 grams of NaOH (0.3282 moles) in 239.61 grams of water in a calorimeter (the total solution has a mass of 13.13 grams + 239.61 grams = 252.74 grams). The specific heat capacity of this solution is 4.18 J/g·ºC. The temperature increases from 34.14 ºC to 47.91 ºC. The calorimeter heat capacity is 58.84 J/ºC. How much heat is given off from the dissolving of the NaOH? How much heat would be given off from dissolving 1 mole of NaOH?



2. A student dissolves 30.0 grams of a solid into 540.0 grams of water in a calorimeter. The solution takes in 55 J of heat and the calorimeter takes in 175 J of heat. How much heat was released from the reaction when the solid was dissolved?



3. Determine H° for this reaction:

2 N2(g) + 5 O2(g) → 2 N2O5(g)

using the following three equations:

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| (1) H2(g) + (1/2) O2(g) → H2O(l)  | H1° = -285.8 kJ  |
| (2) N2O5(g) + H2O(l) → 2HNO3(l)  | H2° = -76.6 kJ  |
| (3) 2 N2(g) + 6 O2(g) + 2 H2(g) → 4 HNO3(l)  | H3° = -696.4 kJ  |

4. Consider:

C7H16 (l) + 11 O2 (g) → 7 CO2 (g) + 8 H2O (l) ΔH˚reaction = - 4130 kJ

 How much energy is released when 2.000 moles of C7H16, is combusted?

5. What is ΔH˚reaction for the following reaction?

CH3OH (g) + 3/2 O2 (g) → CO2 (g) + 2 H2O (g)

 -201.2 kJ/mol 0 kJ/mol -393.5 kJ/mol -241.8 kJ/mol

