

Thermochemistry/HW-Calorimetry and Heat of Reaction Name:_____

Show all the work for the calculations and give the answers in the correct significant figures.

1) Calculate the heat capacity of a sample of radiator coolant if the temperature rises from 5 to 107 °C requires 932 J. (Ans: 9.14 J/°C)

2) How much heat in KJ is released when the temperature of
a) 47.0 g water drops from 45.4 to 10.0 °C? (Ans: -6.96 KJ)

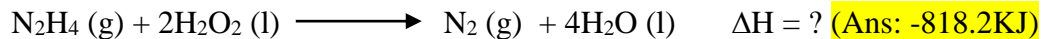
b) 209 g iron drops from 400.0 to 22.6 °C? (Ans: -35.4 KJ)

3) To bring 36.2 g of sulfur from 25.0 °C to its melting point the sulfur must absorb 2402 J of heat. What is the melting point of sulfur? (sp heat S = 0.705 J/g°C) (Ans: 119.0 °C)

4) A 65.0 mL of 0.600 M HI at 18.46 °C is mixed with 84.0 mL of a solution containing excess of KOH at 18.46 °C in a foam cup calorimeter. The temperature rises to 21.96 °C. Calculate the ΔH of the reaction. (Ans: -55.9 KJ/mol)

5) What is the maximum temperature that can be reached in a foam cup calorimeter containing 105 mL of water at 20.12 °C following the addition and dissolving a small pellet of KOH weighing 0.215 g? (ΔH KOH= -57.6 J/mol) (ans: 20.25 °C) (Hint: heat given off by KOH = heat absorbed by water)

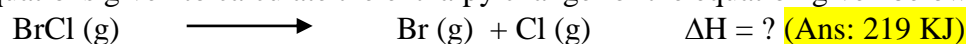
6) Use the equations given to calculate the enthalpy change for the equation given below.



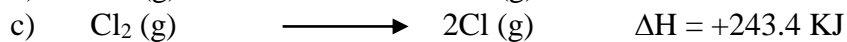
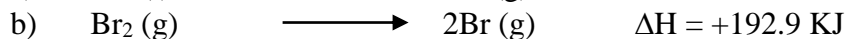
Given:



7) Use the equations given to calculate the enthalpy change for the equation given below.



Given:



8) Use the standard enthalpies of formation from the Appendix to calculate the standard enthalpy change for the following reactions.

(ΔH_f° in KJ/mol: $\text{NH}_4\text{HCO}_3 = -849.4$, $\text{NH}_3 = -46.11$, $\text{H}_2\text{O} = -285.8$; $\text{CO}_2 = 393.5$, $\text{Fe}_2\text{O}_3 = -824.2$, $\text{SiO}_2 = -910.9$)

