Quiz 5.2 – Calorimetry

Name: Key

Question 1 (5 points)

Find the enthalpy of solvation for NaOH based on experimental data from class.

$\left(\text{Remember that } C_{water} = 4.185\frac{J}{g°C}\right)$

$M_{NaOH} = 6.966\,g$

$M_{H_2O} = 80.0\,g$

$\Big\} 86.966\,g$ total mass $\longrightarrow 0.1742$ moles NaOH $= n_{rxn}$

$T_i = 22.9°C \quad T_f = 39.5°C \rightarrow \Delta T = 16.6°C$

$$\Delta H_{rxn} \cdot n_{rxn} = -mC\Delta T \rightarrow \Delta H_{rxn} = \frac{-mC\Delta T}{n}$$

$$\Delta H_{rxn} = \frac{-86.966\,g \cdot 4.185\,\frac{J}{g°C} \cdot 16.6°C}{0.1742\text{ moles}} = -34{,}682\,J/mol$$

$$= -34.7\,kJ/mol$$