Exp. Number	Experiment Title/ Subject	06
2	Heat of Reaction	

Name	Lab Partner	Course	Section
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Temperature of HCl : 15.3°C
Temperature of NaOH: 15.2°C
Final temperature : 28.8°C
Temperature change: 13.55°C

exothermic
$\Delta H = mc\Delta T = (150\,g)(4.184\,J/g^{\circ}C)(13.55^{\circ}C) = 8.50 \times 10^{3}\,J$
$8.50\,kJ$.

Moles of water = $\frac{2.0\,mol}{1\,L} \cdot \frac{1\,L}{1000\,mL} \cdot 75\,mL = 0.15\,mol$.

ΔH per mole of water = $\frac{8.50\,kJ}{0.15\,mol} = 56.7\,kJ/mol$

mass of Mg : 0.292 g
moles of Mg : $(0.292\,g)\left(\frac{1\,mol}{24.305\,g}\right) = 0.0120\,mol$.
initial temperature: ~~15.8°C~~ 15.9°C
final temperature: 23.0°C
Temperature change: 7.1°C

exothermic
$\Delta H = mc\Delta T = (150\,g)(4.184\,J/g^{\circ}C)(7.1^{\circ}C) = 4.456 \times 10^{3}\,J$
$4.456\,kJ$

ΔH per mole of Mg = $\left(\frac{4.456\,kJ}{0.0120\,mol}\right) = 371.33\,kJ/mol$

Part 3

(1) $H^+ + OH^- \rightarrow H_2O \Rightarrow$ (1)* $H_2O \rightarrow H^+ + OH^-$ $\quad \Delta H = 56.7\,kJ/mol$
(2) $Mg(s) + 2H^+ \rightarrow Mg^{2+} + H_2$ $\quad \Delta H = -371.33\,kJ/mol$
(3) $Mg(s) + 2H_2O \rightarrow Mg^{2+} + 2OH^- + H_2$

$\Delta H_{(3)} = \Delta H_{(2)} + 2\Delta H_{(1)*} = -371.33\,kJ/mol + 2(56.7\,kJ/mol)$
$= -257.93\,kJ/mol$

Student's Signature	Date	Instructor/TA Signature	Date

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