

Page 35

8. Rinse and dry the temperature probe, cup, and stirring rod. Dispose of the solution as directed.

9. Repeat steps 4-8, using 100.0mL of 0.5M hydrochloric acid instead of water. Use the same amount of NaOH.

10. Repeat steps 4-8, instead using 50.0mL of 1.0M HCl, and using 50.0mL of 1.0M NaOH.

Observations:

Combining the water and NaOH creates some bubbles. Combining 1.0M HCl and NaOH turns a little pink.

Data:

	Reaction 1	Reaction 2	Reaction 3
Mass NaOH	2.00g	2.00g	
Mass Total	102g	102g	100g
Final Temperature	25.073 °C	31.593 °C	27.357 °C
Initial Temperature	20.675 °C	20.622 °C	20.504 °C
Change in Temperature	4.397 °C	10.972 °C	6.853 °C

Calculations:

$$\text{Mass}_{R1} = 100\text{mL} \cdot 1.00\text{g/mol} = 100\text{g} + 2.00\text{g} = \underline{102\text{g}}$$

$$\text{Mass}_{R2} = 100\text{mL} \cdot 1.00\text{g/mol} = 100\text{g} + 2.00\text{g} = \underline{102\text{g}}$$

$$\text{Mass}_{R3} = 50\text{mL} \cdot 1.00\text{g/mol} = 50\text{g} \cdot 2 = \underline{100\text{g}}$$

$$q_{R1} = 4.18 \cdot 102 \cdot 4.397 = 1875\text{J} / 1000 = \underline{1.875\text{kJ}}$$

$$q_{R2} = 4.18 \cdot 102 \cdot 10.972 = 4678\text{J} / 1000 = \underline{4.678\text{kJ}}$$

$$q_{R3} = 4.18 \cdot 100 \cdot 6.853 = 2865 \text{ J} / 1000 = \underline{2.865 \text{ kJ}}$$

$$\Delta H = -q \quad q = -\Delta H$$

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