

Name _____

The Enthalpy of Neutralization of Phosphoric Acid Report

Data Table

	Trial 1	Trial 2	Trial 3	CALC CHECK
Maximum temperature (°C)				
Initial temperature (°C)				
Temperature change (ΔT)				

Volume of 0.6 M H_3PO_4 _____ mL

Volume of 1.85 M NaOH _____ mL

1. Use the equation below to calculate the amount of heat energy, q , produced in the reaction. In determining the mass, m , of the solution use 1.11 g/mL for the density. Use 4.18 J/(g·°C) as the specific heat, C_p , of the solution. Use the average temperature change of all trials for ΔT .

$$q = C_p \times m \times \Delta T$$

$$m = \underline{\hspace{2cm}} \text{ g}$$

$$\Delta T = \underline{\hspace{2cm}} \text{ } ^\circ\text{C}$$

$$q = \underline{\hspace{2cm}} \text{ J} = \underline{\hspace{2cm}} \text{ kJ}$$

2. Use the heat energy that you calculated in 2 above to determine the enthalpy change, ΔH , for the reaction in terms of kJ/mol of phosphoric acid. This is your experimental value of

$$\text{mole}_{\text{phosphoric acid}} = \underline{\hspace{2cm}} \text{ mole}$$

$$\Delta H = \underline{\hspace{2cm}} \text{ kJ/mole}$$

Use a table of standard thermodynamic data to calculate the ΔH of neutralization for phosphoric acid. Consider this the accepted value of ΔH . How does your experimental value for ΔH compare to the accepted value?

$$\Delta H_{\text{theoretical}} = \underline{\hspace{2cm}} \text{ kJ/mole}$$

Calculate the percent discrepancy between the calculated (accepted) value of the ΔH of neutralization of H_3PO_4 and your experimental value.

$$\% \text{ Discrepancy} = \underline{\hspace{2cm}} \%$$