

Name \_\_\_\_\_

## Base's Bold Encounter with Acids: The Reaction and Its Products

### Open-Ended Response Answer Key

1. Neutralization reactions have numerous practical applications, such as in wastewater treatment to adjust pH levels, in pharmaceuticals to formulate medications, and in agriculture to balance soil acidity. They are also used in the food industry to neutralize excess acidity in foods.
2. To demonstrate the neutralization reaction between sodium hydroxide (NaOH) and sulfuric acid (H<sub>2</sub>SO<sub>4</sub>), you would need NaOH pellets, H<sub>2</sub>SO<sub>4</sub> solution, a beaker, stirring rod, pH indicator, and safety goggles. The steps would include adding NaOH to H<sub>2</sub>SO<sub>4</sub> while stirring, observing the rise in pH indicated by a color change, and noting the formation of water and a salt.
3. The pH scale measures the acidity or alkalinity of a solution. A pH of 7 is considered neutral, indicating a balanced concentration of hydrogen ions (H<sup>+</sup>) and hydroxide ions (OH<sup>-</sup>). Neutralization reactions aim to achieve a pH of 7 by neutralizing excess hydrogen ions from the acid with hydroxide ions from the base.
4. In industrial settings, managing and disposing of byproducts from neutralization reactions is crucial. This includes treating and safely disposing of salts and ensuring that pH-adjusted wastewater meets environmental regulations. Implementing eco-friendly practices, such as recycling and reusing byproducts, can minimize environmental impact.

