

Reacting acids and bases lab report



**ASSIGN
BUSTER**

Reacting Acids and Bases Lab Report Introduction Every liquid, except for distilled water, has either acidic or basic traits. An acid is sour tasting, and gives a sharp stinging pain in a cut or wound, and bases taste bitter, and feel slippery. A pH scale is used to determine what traits a liquid has; acidic or basic. The scale focuses on OH^- (hydroxide ions) and H^+ (hydrogen ions). The scale goes from 0 to 14. 7 is distilled water, as it is directly in the middle; neither acidic or basic. Acids are between 0 and 7 and have a high H^+ concentration, and bases from 7 to 14 with a low H^+ concentration.

Neutralization happens when an acid and base react together and the base is consumed. The product is a neutral solution of water and a salt. HCl (acid) + NaOH (base) changes to H_2O and NaCl (water and salt). The purpose of this lab was to determine what happens when an acid reacts with a base, and how to detect a neutralization. Results Table: Acids and Bases Lab 2

Compound	Observations	Type of Compound (Acid/base? Ionic/Covalent?)	Amount (Drops)	Conductor of Electricity? Yes/ No
NaOH (0.5 mol/L)				
Reactant	Clear, odourless, liquid	Base Ionic	20	Not tested
Phenolphthalein Indicator	Clear, liquid, alcohol odour	pH indicator	1	Not Tested
HCl (0.5 mol/L)				
Reactant	Clear, liquid, sour odour	Acid Ionic	44	Not tested
H_2O (water)				
Product	Clear, liquid, odourless	Non-reactive Covalent	Not measured	No
NaCl (salt)				
Product	White, powdery, crusty, grainy texture	Neither Ionic	Not measured	Yes

In this lab, the neutralization of an acid and a base was observed. 20 drops of sodium hydroxide were added to an evaporating dish, followed by a drop of phenolphthalein indicator. The solution turned pink when the indicator was included. Quantitative Neutralization was used by adding drops of hydrochloric acid one by one to a sodium hydroxide-phenolphthalein

solution. After a certain number of drops were added, the change of pH was seen by the change of colour in the dish, from red to clear. When the test solution had turned clear, it was determined that the solution was neutralized. The solution was evaporated, and the product was a white, chalky substance. Water was added to it, and tested for conductivity.

Discussion The purpose of this lab was to determine what happens and how to detect when an acid and a base neutralize. The equation for this lab was $\text{HCl} + \text{NaOH} \rightarrow \text{H}_2\text{O} + \text{NaCl}$. As acids and bases have the same strength, they created a double displacement reaction. When the phenolphthalein was added to the solution and the colour turned pink, you knew that the base had reacted (Acids and Bases). When the hydrochloric acid was added, neutralization occurred, and the acid turned the phenolphthalein colourless. After 44 drops, the solution was neutralized, as the acids and bases were equal in amount (7 on the pH scale, meaning the solution was water and salt). When the solution was put on the evaporator, the water evaporated, leaving the salt. Then distilled water was added to the sodium chloride and tested for conductivity. The solution did conduct electricity. Sodium chloride (NaCl) is an ionic compound, therefore it holds ions that conduct electricity. In this experiment, different groups used different droppers, so the amount dropped into the dish could have been different, therefore each group had a different quantity of drops used. Some groups had an unusually small number, which is confusing, as groups can misinterpret this and believe that they did the lab wrong. A way to make this lab more clear would be to do it together as a class, so everyone ends up with the same observations and has a better understanding of the lab.

Conclusion It is important to understand the pH scale, as it is all around us in our world. In nature, and in

our manmade products, such as dangerous liquids that we might use around the house everyday, like cleaning products. If you understand pH levels, you understand what products to stay away from, as well as receive an understanding of our environment and what it requires to sustain its needs. This lab showed us how to detect a neutralization on the pH scale, and what happens when this occurs.