

Properties of Acids and Bases

(Adapted from Flinn Scientific Acid - Base Test Kit I - #AP4567)

Introduction

Battery acid, stomach acid, acid rain - just a few acids in our everyday life! What does it mean when something is acidic? How do acids differ from bases? In this lab, the physical and chemical properties of a variety of acids and bases will be examined.

Concepts

- Acids vs. Bases
- Indicators
- pH

Background

Acids and bases make up two groups of substances that can be categorized by their physical and chemical properties. Let's take a look at the distinguishing properties:

1. **Taste:** Acids, such as lemons or oranges, taste sour. Bases, such as soap, taste bitter. *Note:* Taste should never be used to identify a lab chemical or unknown substance. This lab does not include a test using taste.
2. **Feel:** Acid solutions do not feel much different than water; however, they sting if they contact broken skin. Base solutions have a slippery feeling. *Note:* Lab chemicals or unknown substances should never be touched with the bare skin. This lab does not include a test using feel.
3. **Indicators:** An indicator is a chemical compound, either on a test paper or in a solution, that changes color depending on the acidity or basicity of a solution and, thus, is used to test for the presence of acids or bases. There are many different kinds of indicators. Litmus paper and phenolphthalein indicator solution are two of the most common.
 - Blue litmus paper turns red when dipped in an acid solution of pH 1-6.
 - Red litmus paper turns blue when dipped in a basic solution of pH 8-14.
 - In a neutral solution with pH 7, each paper retains its original color.
 - Phenolphthalein indicator solution turns a pink color in a basic solution but remains colorless (sometimes cloudy) in an acidic or neutral solution.
4. **Reaction with carbonates:** While most bases do not react with carbonates, acids react with carbonates to release carbon dioxide gas. For example:
$$\text{BaCO}_3 + 2\text{HCl} \rightarrow \text{BaCl}_2 + \text{CO}_2 + \text{H}_2\text{O}$$
5. **Reaction with metals:** While most bases do not react with metals, acids react with active metals to release hydrogen gas. For example:
$$\text{Fe} + 2\text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2$$

Lab 20 Properties Of Acids And Bases

M Lipman



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