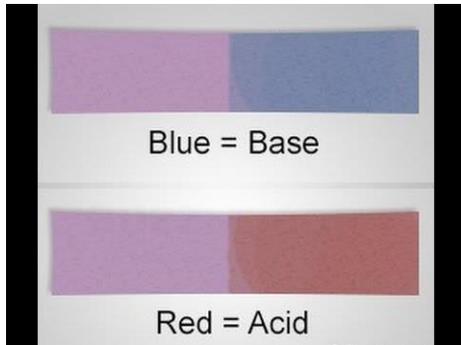


6.3 Describing Acids and Bases

What are the properties of Acids? Have you had any fruit to eat lately? If so, an acid was probably part of your meal. Many common items contain acids. Acids are compounds with specific characteristic properties. **An acid reacts with metals and carbonates, tastes sour, and turns blue litmus paper to red.**



Acids are an important part of our lives. Folic acid, found in green, leafy vegetables, is important for cell growth. Hydrochloric acid in your stomach helps with digestion. Phosphoric acid is used to make plant fertilizers. Sulfuric acid is in many types of batteries, giving it the nickname “battery acid.”

Reactions with metals – acids react with certain metals to produce hydrogen gas. Platinum and gold don’t react with most acids, but copper, zinc, and iron, do. When they react, the metals seem to disappear in the solution. This is one reason acids are described as **corrosive, meaning they “wear away” other materials.**



Magnesium, Zinc, and lead produce bubbles in HCl

The purity of precious metals can be determined using acids. Acid can be poured on gold jewelry. The more gas bubbles produced, the lower the purity of the gold – copper or zinc produce bubbles of hydrogen gas when exposed to an acid.

Reactions with Carbonates – acids also react with carbonate ions. Carbonate ions contain carbon and oxygen atoms bonded together with an overall negative charge (CO_3^{2-}). One product of the reaction of an acid with a carbonate is the gas carbon dioxide.

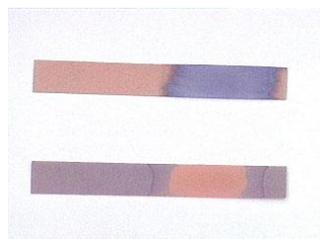
Objects that contain carbonate ions include seashells, eggshells, chalk, and limestone. Geologists use this property of acids to identify rocks. If carbon dioxide gas is produced when dilute acid is poured on a rock's surface, then the rock could be made of limestone.



Acidic Foods have a Sour Taste – If you've ever tasted a lemon, you've had firsthand experience with the sour taste of acids. Citrus fruits, such as lemons, grapefruit, and oranges, all contain citric acid. Other foods such as vinegar and tomatoes also contain acids.



Reactions with Indicators – Chemists use indicators to test for acids. Litmus paper is an example of an indicator, a compound that changes color when it comes in contact with an acid. Acids turn blue litmus paper to red.



What are the properties of Bases? Bases are another group of compounds that can be identified by their common properties. A base tastes bitter, feels slippery, and turns red litmus paper blue.

The properties of bases are often described as the “opposite” of acids. Bases have many uses. Ammonia is used in fertilizers and household cleaners. Baking soda is a base called sodium bicarbonate, which causes baked goods to rise.



Bitter Taste – Quinine (a chemical from the bark of a Remijia or Cinchona tree) causes the slightly bitter taste in tonic water or some types of tea. Other foods that contain bases include melon, almonds, and cocoa beans.

Slippery Feel – Bases have a slippery feel. Many soaps and detergents contain bases. The slippery feeling of your shampoo is a property of the bases it contains.

Reactions of Bases – Unlike acids, bases don’t react with metals. They also don’t react with carbonates to form carbon dioxide gas. The lack of a

reaction can be a useful property in identifying bases. If you know that a compound doesn't react with metals, you know the compound is probably not an acid. Another important property of bases is how they react with acids in a type of chemical reaction called neutralization, in which acids and bases deactivate one another.

Reactions with indicators – since litmus paper can be used to test acids, it can be used to test bases, too. Unlike acids, however, bases turn red litmus paper blue. An easy way to remember this is to think of the letter B. **B**ases turn litmus paper **b**lue.