

Factors contribute to the acidity of water



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The acidity in natural water can be caused by the bedrock and soil composition of the area around the stream. This factor can be considered as one of the most important factor that influence the pH of the water. Soils contain calcium, limestone and a layer of sand or gravel with a granite base. The calcium and limestone are able to neutralize sulphuric or nitric acid. Due to the neutralizing effect, the pH of the natural water will be higher if the bedrock is composed of limestone. Therefore, the acidity of natural water would be offset or buffered due to the higher pH.

Besides, the dumping of chemical into water also alters the acidity of the water. Human activities such as construction, mining and industrial operations add in different chemicals into the water that do not exist naturally. The chemicals alter the natural water's pH, either rise or fall. For instant, most washing powders and detergents contain phosphates which are used to soften the water. These and other chemicals contained in washing powders will increase the acidity of the water and affect the health of all forms of life in the water. The next factor is eutrophication.

Untreated domestic sewage and run off from agricultural fields lead to excessive amount of nutrients such as phosphorus and nitrogen flowing into the natural water. Accumulation of the nutrients, particularly phosphorus in the water leads to excessive growth of algae population. Rapid growth of algae cover entire surface of the water and block the sunlight from entering, thus disrupt photosynthesis process of aquatic plant. As time passes, algae begin to die and decompose by bacteria, producing acidic byproducts which make the water acidic.

Another factor is acid rain which mostly occurs due to human activities. Acid rain is caused by emission of sulfur dioxide and nitrogen oxides released from factories, vehicles and power stations. These gases will then react with water vapours in the atmosphere to produce sulfuric acid, nitric acid and other pollutants called nitrates and sulfates, which will increase the acidity of the natural water. In addition, sulfuric acid and nitric acid will eventually fall back to the earth surface as acid rain.

The last factor is the coal mine drainage. Iron sulfide or pyrite is one of the mineral found in or around the coal seams, which has a high potential causing the acid drainage. Under the presence of water and oxygen, the large amount of metallic sulfide undergoes oxidation, which can occur in mining or other major land disturbances. At the same time, the sulfide reacts with water to form the high acidity products such as ferrous oxide and silt into the ground and surface water, increasing the acidity of the natural water.