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Experiment No-8: Water quality assessment (pH, EC, alkalinity)

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Theory

pH

pH is the measure of the acidity of a solution of water. The pH scale commonly ranges from 0 to 14. The scale is not linear but rather it is logarithmic. For example, a solution with a pH of 6 is ten times more acidic than a solution with a pH of 7. Pure water is said to be neutral, with a pH of 7. Water with a pH below 7.0 is considered acidic while water with pH greater than 7.0 is considered basic or alkaline.

Conductivity

Conductivity is a numerical expression of an aqueous solution's capacity to carry an electric current. This ability depends on the presence of ions, their total concentration, mobility, valence and relative concentrations, and on the temperature of the liquid. Solutions of most inorganic acids, bases, and salts are relatively good conductors. In contrast, the conductivity of distilled water is less than 1 $\mu\text{mhos/cm}$. Because conductivity is the inverse of resistance, the unit of conductance is the mho (ohm spelled backwards), or in low-conductivity natural waters.



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Alkalinity

Alkalinity is the sum total of components in the water that tend to elevate the pH to the alkaline side of neutrality. It is measured by titration with standardized acid to a pH value of

4.5 and is expressed commonly as milligrams per liter as calcium carbonate (mg/L as CaCO_3). Alkalinity is a measure of the buffering capacity (ability to resist changes in pH) of the water, and since pH has a direct effect on organisms as well as an indirect effect on the toxicity of certain other pollutants in the water, the buffering capacity is important to water quality. Commonly occurring materials in water that increase alkalinity are carbonates, bicarbonates, phosphates and hydroxides. Limestone bedrock and thick deposits of glacial till are good sources of carbonate buffering. Lakes within such areas are usually well- buffered.



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Observation: Students must compare your result with above definitions and write proper conclusion.

Sample No.

Conclusion

1.

2.