RESEARCH ARTICLE OPEN ACCESS

Determination of the Ph &Turbidity Value in Betul Block Five Year

Ravi Kumar*, Ankush Jain**, Shivanshi***
** (Student of B.Tech 3rd Year, Career Point University, Kota)*
*** (M.Tech Structure Engineering Assistant Professor Civil Department, Career Point University, Kota)*
****(M.Tech Structure Engineering Assistant Professor Civil Department, Career Point University, Kota)*

ABSTRACT
Acidic and basic are two extremes that describe chemicals, just like hot and cold are two extremes that describe temperature. Mixing acids and bases can cancel out their extreme effects; much like mixing hot and cold water can even out the water temperature. A substance that is neither acidic nor basic is neutral. The ph of the water in betul block is increasing year by year and day by day. It was observed that there are 0.5% increase in the ph of water in betul block. The optimum pH will vary in different supplies according to the composition of the water and the nature of the construction materials used in the distribution system, but is often in the range 6.5–9.5. Extreme pH values can result from accidental spills, treatment breakdowns, and insufficiently cured cement mortar pipe linings. No health-based guideline value is proposed for pH.

I. INTRODUCTION

Acidic and basic are two extremes that describe chemicals, just like hot and cold are two extremes that describe temperature. Mixing acids and bases can cancel out their extreme effects; much like mixing hot and cold water can even out the water temperature. A substance that is neither acidic nor basic is neutral.

The pH scale measures how acidic or basic a substance is. It ranges from 0 to 14. A pH of 7 is neutral. A pH less than 7 is acidic, and a pH greater than 7 is basic. Each whole pH value below 7 is ten times more acidic than the next higher value. For example, a pH of 4 is ten times more acidic than a pH of 5 and 100 times (10 times 10) more acidic than a pH of 6. The same holds true for pH values above 7, each of which is ten times more alkaline—another way to say basic—than the next lower whole value. For example, a pH of 10 is ten times more alkaline than a pH of 9.

Pure water is neutral, with a pH of 7.0. When chemicals are mixed with water, the mixture can become either acidic or basic. Vinegar and lemon juice are acidic substances, while laundry detergents and ammonia are basic.

0	7	14
Acidic	neutral	basic

In general, water with a pH < 7 is considered acidic and with a pH > 7 is considered basic. The normal range for pH in surface water systems is 6.5 to 8.5 and for groundwater systems 6 to 8.5. Alkalinity is a measure of the capacity of the water to resists a change in pH that would tend to make the water more acidic. The measurement of alkalinity and pH is needed to determine the corrosively of the water.

The pH of pure water (H20) is 7 at 25oC, but when exposed to the carbon dioxide in the atmosphere this equilibrium results in a pH of approximately 5.2. Because of the association of pH with atmospheric gasses and temperature, it is strongly recommended that the water be tested as soon as possible. The pH of the water is not a measure of the strength of the acidic or basic solution and alone does not provide a full picture of the characteristics or limitations with the water supply.

In general, water with a low pH (< 6.5) could be acidic, soft, and corrosive. Therefore, the water could leach metal ions such as iron, manganese, copper, lead, and zinc from the aquifer, plumbing fixtures, and piping. Therefore, a water with a low pH could contain elevated levels of toxic metals, cause premature damage to metal piping, and have associated aesthetic problems such as a metallic or sour taste, staining of laundry, and the characteristic "blue-green" staining of sinks and drains . The primary way to treat the problem of low pH water is with the use of a neutralizer. The neutralizer feeds a solution into the water to prevent the water from reacting with the house plumbing or contributing to electrolytic corrosion; a typical neutralizing chemical is soda ash. Neutralizing with soda ash increases the sodium content of the water. Water with a pH > 8.5 could indicate that the water is hard. Hard water does not pose a health risk, but can cause aesthetic problems. These problems include: Formation of a "scale" or precipitate on piping and fixtures causing water pressures and interior Diameter of piping to

decrease; Causes an alkali taste to the water and can make coffee taste bitter;
Formation of a scale or deposit on dishes, utensils, and laundry basins;

Difficulty in getting soaps and detergents to foam and formation of insoluble precipitates on clothing, etc.

II. DECREAESES EFFICIENCY OF HEATERS

Typically these problems are encountered when the hardness exceeds 100 to 200 milligram (mg) CaCO3/liter (L), which is equivalent to 12 grains per gallon. Water can be softened through the use of ion-exchange or the addition of a lime-soda ash mixture, but both processes increase the sodium content of the water. Note: "The ideal pH level of alkaline ionized water for long term human consumption is between 8.5 and 9.5 (and no greater than 10.0) with the ideal ORP value around -200mV to -300mV (and in no way significantly greater than -400mV). (Source: Bowell Water Ionizers)". Measuring Water Quality (Field Meters) - Students / Professionals Neutralizing Filter Systems pH of Common Liquid.

Vinegar	3.0
Wine	2.8 - 3.8
Beer	4 - 5
Milk	+6.3 - 6.6

III. TURBIDITY

The definition of Turbidity is the cloudiness or haziness of a fluid caused by suspended solids that are usually invisible to the naked eye. The measurement of Turbidity is an important test when trying to determine the quality of water. It is an aggregate optical property of the water and does not identify individual substances; it just says something is there.

Water almost always contains suspended solids that consist of many different particles of varying sizes. Some of the particles are large enough and heavy enough to eventually settle to the bottom of a container if a sample is left standing (these are the settle able solids). The smaller particles will only settle slowly, if at all (these are the colloidal solids). It's these particles that cause the water to look turbid.

The term **Turbidity** (also called haze) can also be applied to transparent solids like plastic and glass A commercial glass electrode, in conjunction with a saturated potassium chloride-calomel half cell, calibrated in the usual manner with 0.05 *M* potassium acid phthalate of pH=4.0, was used for all determinations of pH throughout the present work. The advantages of this electrode are well-known, but some care must be used in applications to paper-water mixtures. When determinations in neutral or nearly neutral systems were made, after the glass electrode had been used in solutions either distinctly acidic or alkaline, the values obtained were at first too low or too high, in the direction of the previously measured pH.

IV. MEASURMENT OF TURBIDITY

The most common measurement for turbidity in the United States is the Nephelometric Turbidity Units (NTU).

There are several ways you can check turbidity in water, the most direct being a measure of attenuation, or reduction in strength, of a light source as it passes through a water sample. An older system was called the Jackson Candle method, with units expressed as **JTU** or Jackson Turbidity Units. It used a candle flame viewed through a clear column filled with water. The length of water that the candle could be seen through related to the turbidity in the water sample. With the advent of electronic meter technology this method is no longer used.

The particles suspended in the water will scatter a light beam focused on them. The scattered light is then measured at various angles from the incident light path. This is now accepted as a more precise measure of turbidity. To measure turbidity this way uses a nephelometer, such as the LaMotte 2020we. *Nephele* is the Greek word for "cloud"; *metric* means "measure." *Nephelometric*, therefore, means "measuring cloudiness." Most nephelometers measure the scattered light at 90°. If more light is able to reach the detector it means there are many small particles scattering the source beam, less light reaching the detector means fewer particles. Nephelometric Turbidity Units (**NTU**) are the units of measurement used by a nephelometer meeting EPA design criteria. The amount of light scattered is influenced by many aspects of the particles like color, shape, and reflectivity. Because of this, and the fact heavier particles may settle quickly and may not contribute to the turbidity reading, the relationship between turbidity and total suspended solids (TSS) can change depending on the location that the test sample was collected.

Measuring turbidity in environmental applications, such as the oceans, rivers and lakes, a Sochi disk can be used. This is a black and white disk that is lowered into the water until it can no longer be seen. At that depth (called Secchi depth) the correlating number is recorded as a measure of the clarity in the water. The advantage in using this device in open waters is the ability to measure turbidity at various depths where multiple turbidity layers are present. This device is also easy to use and relatively inexpensive.

Table – 1 Determine the ph value present time and comparison to five year value

S.N.	NAME OF VILLAGE	2010	2011	2012	2013	2014	2015	PRESENT TIME
1	**BADORA**	7.0	8.5	7.5	7.0	7.5	7.5	7.5
2	**SURGAW**	7.0	7.0	7.2	7.5	7.8	7.5	7.27
3	**DANORA**	7.0	7.0	7.5	7.5	7.5	7.1	7.22
4	**BHADUSH**	7.5	7.5	7.5	7.5	7.5	7.5	8.06
5	**MAHETGONE**	7.1	7.22	7.5	7.5	8.5	7.5	7.60
6	**MILANPUR**	7.5	7.4	7.5	7.5	7.0	7.3	7.54
7	**SUHAGPUR**	7.1	7.0	7.0	7.5	8.0	7.5	7.66
8	**SONA GHATI**	7.2	7.1	7.0	8.8	7.0	7.1	7.5
9	**JAMTHI**	6	7.5	7.5	7.6	7.5	7.5	8.65
10	**UADHADAN**	6.5	7.5	7.0	8.5	7.0	7.5	7.59

Table - 2 Determine the turbidity value present time and comparison to five year value

S.N.	NAME OF VILLAGE	2010	2011	2012	2013	2014	2015	PRESENT TIME
1	**BADORA**	4.0	5.0	3.0	4.0	4.5	2.0	3.4
2	**SURGAW**	4.0	4.1	4.0	5.0	3.4	4.5	2.8
3	**DANORA**	8.0	4.0	3.0	3.5	4.5	5.0	6.9
4	**BHADUSH**	5.0	4.0	6.0	5.5	5.0	6.0	6.5
5	**MAHETGONE**	3.4	3.0	.2.0	4.5	5.1	6.2	7.2
6	**MILANPUR**	5.0	5.2	5.0	4.1	4.5	5.34	6.0
7	**SUHAGPUR**	4.67	4.75	5.0	5.5	3.45	5.0	5.1
8	**SONA GHATI**	4.5	5.0	4.0	5.1	4.47	4.24	3.9
9	**JAMTHI**	7.0	6.0	5.0	5.25	6.76	6.89	7.0
10	**UADHADAN**	5.57	6.0	7.0	7.25	7.3	7.41	7.5

V. EFFECT OF PH ON HEALTH

The term pH is a measure of the concentration of hydrogen ions in a diluted solution. It can range from 0 to 14, with 7 denoting a neutral value. Acidic water has a pH below 7; alkaline water, above 7. The health effects of pH on drinking water depend upon where the pH falls within its range. The U.S. Environmental Protection Agency, which classifies pH as a secondary drinking water standard, recommends a pH between 6.5 and 8.5 for drinkingwaterEye and Skin Irritation

According to the World Health Organization, health effects are most pronounced in pH extremes. Drinking water with an elevated pH above 11 can cause skin, eye and mucous membrane irritation. On the opposite end of the scale, pH values below 4 also cause irritation due to the corrosive effects of low pH levels. WHO warns that extreme pH levels can worsen existing skin condition

Heavy Metal Effects

Other than the unpleasant aspect of foul-tasting water, low pH values generally have few negative health effects. Acidic drinking water can cause serious problems, however, through the leaching of heavy metals from plumbing systems. The nonprofit Water Systems Council warns that these toxic metals can include substances such as lead. The New York State Department of Health explains that lead exposure can lead to a host of neurological and reproductive problems, such as seizures, hearing loss and miscarriages. Ingestion of lead-tainted water is one way adults can become exposed to this toxin.

Gastrointestinal Upset

Leaching of heavy metals causes a domino effect that can impact the gastrointestinal system. Overexposure to zinc from corroded pipes can cause nausea, vomiting or diarrhea. Over ingestion of copper results in similar symptoms. These effects are not limited to heavy metals; high pH levels lead to similar ailments in sensitive individuals.

Increased Contaminant Exposure

Aquatic wildlife also suffers from the effects of pH extremes. Fish die-off occurs when pH levels dip below 4.5 or rise above 10, according to a report by the Northeastern Regional Aquaculture Center at the University of Maryland. Several external forces can cause fluctuations or extremes in pH, including bedrock degradation, acid rain, wastewater discharge and carbon dioxide.The impact on surface water is significant because more than 60 percent of the public water supply comes from surface water sources, according to the U.S. Geological Survey. Therefore, if fish are dying off due to low pH, this increases the possibility of other toxic effects caused by high ammonia levels, disease-causing bacteria and parasites.

VI. CONCLUSION

Although pH usually has no direct impact on water consumers, it is one of the most important operational water-quality parameters. Careful attention to pH control is necessary at all stages of water treatment to ensure satisfactory water clarification and disinfection. For effective disinfection with chlorine, the pH should preferably be less than 8. The pH of the water entering the distribution system must be controlled to minimize the corrosion of water mains and pipes in household water systems. Failure to do so can result in the contamination of drinking-water and in adverse effects on its taste, odour, and appearance.

The optimum pH will vary in different supplies according to the composition of the water and the nature of the construction materials used in the distribution system, but is often in the range 6.5–9.5. Extreme pH values can result from accidental spills, treatment breakdowns, and insufficiently cured cement mortar pipe linings. No health-based guideline value is proposed for pH.

They essentially accumulate wind born turbidity. The present work has estimated the rate of turbidity accumulation and observed that the turbidity can be effectively removed by using alum for coagulation process. Alum dose in the range 50 mg/L can effectively reduce the turbidity of water. The turbidity cannot be reduced to zero level, yet it can be brought down to minimum permissible level

REFRENCES

[1]. S. K. GARG of "water supply Engineering".
[2]. Journal paper of the nation bureau of standards volume 22.
[3]. Sun and Wind Energy, 2010, no.7, p. 8.
[4]. Study of the Laboratory result of betul block.