WATER POLLUTION : DRINKING WATER ANALYSIS FROM DIFFERENT STATIONS AT SAILU DIST PARBHANI.

P. R. Pande
Dept of Chemistry, Nutan Mahavidyalaya, selu ,DistParbhani

Introduction

Water is commodity which is essential for mankind. Human life cannot exist without water for a few days. It is the nature's free gift to human race. It is available in various forms such as river, lakes, streams etc. The importance of water in human life is so much that the development of any city of the world has practically taken place near some source of water supply .The use of water by man, plants and animals is universal. As a matter of fact, every living soul requires water for its survival. It is essential for life health and sanitation. Man can live without food for about one month, but he can hardly survive for three to four days without water. The water covers three quarters of our planet and yet it is said to note that about 70% of the world's survive without clean water. Water pollution is one of the biggest issues facing India right now. As may be evident, untreated sewage is the biggest source of such form of pollution in India. There are other sources of pollution such as runoff from the agricultural sector as well as unregulated units that belong to the small-scale industry. The situation is so serious that perhaps there is no water body in India that is not polluted to some extent or the other. In fact, it is said that almost 80% of the water bodies in India are highly polluted. This is especially applicable of ones that some form or the other of human habitation in their immediate vicinity. Ganga and Yamuna are the most polluted rivers in India.

Need for analysis:

1 To ascertain if the supplies maintain the required degree of purity and to find out the extent of any variations which occurs?
2. To ascertain the effect of heavy rainfall or so long continued drought on river waters. To decide that the water obtained from some additional sources or sources of supply will be pure, wholesome, not too hard and free from the risk of any pollution.
3. To find out the organism responsible for spreading water born diseases.
4. To suggest the best method of purifying, of softening or of preventing action on mains and supply pipes etc.

Water pollution is one of the biggest issues facing India right now. As may be evident, untreated sewage is the biggest source of such form of pollution in India. There are other sources of pollution such as runoff from the agricultural sector as well as unregulated units that belong to the small-scale industry. The situation is so serious that perhaps there is no water body in India that is not polluted to some extent or the other. In fact, it is said that almost 80% of the waterbodies in India are highly polluted. This is especially applicable of ones that some form or the other of human habitation in their immediate vicinity. Ganga and Yamuna are the most polluted rivers in India.

Procedure for sampling:

The process of collecting samples is known as sampling it is very essential to collect a representative sample and preserve it till all the analyses are carried out in sampling sites selection, collection of sample, there handling and preservation are important.

Parameter adapted:

To check the potability of water which is consumed by the people at present in Sailu Analysis was carried out from different areas and from that we can conclude, whether the water is fit for drinking or not. Following are the parameters which are carned out during the analysis of water. They are PH, EMF Acidity, Alkalinity, CO, Chlorides, Residual Chlorine, Hardness and Total solids.

Procedure adapted for each parameter

1. PH:- Ph of water was found out by using buffer solution No.4 and PH meter. Ph meter
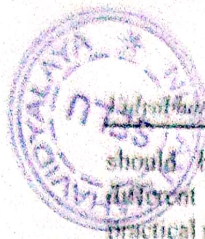
should be adjusted to 4 PH and then PH of different samples is to be taken. For most practical purposes, the PH of aqueous solution can be taken as negative logarithm of hydrogen activity, 1-7 acidic, 7-14 increasingly alkaline and 7 is neutral. The PH of neutral water usually lies in the range of 4 4-8.5

2 Total alkalinity:-it is the measure of capacity of the water to neutralize a strong acid. Total alkalinity, carbonates and bicarbonates is estimated by titrating the sample

with a strong acid HCl having normality 0.05 N.

3. Total acidity: It is expressed by normality of the solution which is equal to thenumberof grams equivalents of acid in one liter of solution.

Acidity can be determined by titrating the sample with a strong base such as NaOH having normality 0.05 N using methyl orange or phenolphthalein as an indicator. If the sample has strong mineral acid and their salts it is titrated using methyl orange as an indicator. This is

collected as methyl orange acidity.If the sample is titrated using phenolphthalein it is phenolphthalein acidity. The resultant value is the total acidity.

4. The CO2-Which is found in well waters and surface water to a great extent cause corrosion. The CO, present in water in excess of carbonates and bicarbonates known as free CO, The sample is taken and 2/3 drops of phenolphthalein as an indicator, if colour does not become red then CO, is present. The titration is against 0.05 N NaOH till pink coloure appears.

5. Chlorides:-It occurs naturally in all types of water. In natural freash water, however its concentration remains quite low. The most important source of chloride in natural water is the discharge of sewage. In very high concentration it gives a salty taste to the water.
Chemicals used are:

Silver nitrate (AgNO)0.01 N

698 gms of AgNO, + 100 ml distilled waterNaCl 0.011 N

0.5984 gms of NaCl + 1000 ml distilled water

Potassium chromate (K, Cr,O,) 2%

2 gms of potassium chromate + 100 ml distilled water 10 ml of sample is taken and few drops of potassium chromate as an indicator. Titrate

this mixture against $AgNO_3$ 0.01 N. End point of reaction is yellow to brick red.

6. Dissolved oxygen- The presents of dissolved oxygen is essential to maintain the higher forma of biological life and to keep the proper balance of various populations thus making the water body healthy. The chemical and biochemical processes undergoing in a water body are largely depend upon the presence of oxygen.

Chemicals and reagents:

Sodium thiosulphate

Manganouschloride solution (winkler A)- Add 40 gms of manganous chloride to about 25 mi distilled water in a beaker Transfer this to a volumetric flask and make upto 100 ml with distilled water.

Alkaline potassium iodide reagent (Winkler B).-Dissolve 33gms of NaOH and 10gms of Kl in 75 ml distilled water. Cool the solution and make up the volume of 100 ml.

Concentrated sulphuric acid

Starch indicator 1%

Oxygen from any given water sample is generally estimated by winkler method, Mncl2 when added to a known volume of water containing dissolved oxygen it will be converinto manganous hydroxide, this is dissolved in HCl and made to react with KI so that andequivalent quantity of iodine is then liberated, iodine produces

7. Total solids:- The surface water containing filterable and infilterable solids For the determination of total solids as a convenient quantity of sample water to be taken is (250 ml) but

if the water is very hard then a 50 ml of sample water will be suitable The estimation is considered on infiltered sample. The water sample should be evaporated in an oven for one hour at 103 C-105°C. The residue after the evaporation subs which are present in given sample of water. blue colour due to idolization

8. Hardness:- Hardness is calculated as total hardness and permanent hardness Total hardness:- Take 10 ml of water to be tested,

Scanned with OKEN Scanner

add one ml of buffer solution and few drops of Erichrome black T as an indicator and litrate with standard EDTA solution until the colour changes from urine red to blue. Permanent hardness-Place 250 ml of sample and boil gently for 20 min: Cool and filter in 250 ml standard flask. Do not wash filter paper Dilute filtrate upto the mark Mix well Pipette out 10 ml of this solution in a conical flask

Results and discussion:

The values of the analysis from chart no. 2. are compared with the values from chart no I as these are standard values from these observation it is found that PH of all samples as nearly equal to sevene, neutral PH this indicate water is potable. The mean chloride value is 124.78. The accepted value is upto 200, but in the analysis the amount of chlorides was observe negligible.

PRINCIPAL
Nutan Mahavidyalaya
SELU. Dist. Parbhani

International Multidisciplinary Conference on Environment: Issues, Challenges, Impact & Steps Towards Sustainable Development 24th September 2022

1549