

## MICROANALYSIS OF WATER

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**Abstract:** Water is one of basis need of living organism. Because water contains many essentials minerals and others material which are important for all life on earth. But with this it's also contains the impurities which are harmful and diseases causing. This work shows the analysis of such impurities by using limited samples and chemical. This article shows presences of different impurities in different samples of water.

**Keywords:** Microanalysis, Micro plate.

### INTRODUCTION:

Water is one of important need of for the living organism. But this water may lead to various disease conditions due to presence of impurities. So, there is various method of analysis of these impurities. Microanalysis is the chemical identification and quantitative analysis of very small amount of chemical substances (Generally less than 10 mg or 1 ml) or very small surface of material (Generally less than 1cm square). One of the pioneers in the microanalysis of chemical element was the AUSTRALIAN NOBEL PRIZE winner Fritz Pregl

### ADVANTAGES OF MICROANALYSIS:

Compare to normal analysis method's , Microanalysis: 1)Required less time for preparation, 2) Required less sample and solvent, thus produce less waste and is more cost effective

### DISADVANTAGES OF MICROANALYSIS:

1) Handling of small quantities is not always simple 2) Higher accuracy of weighing is necessary (Example –use of accurate balance).

Water as a solvent

Pure water is colourless, odour less and tasteless .It is compose of hydrogen and oxygen, because water become contaminated by the substances with which it comes into contact, it is not available for use in its pure state.

Water impurities: Water impurities include dissolved and suspended solid .Calcium-bi-carbonate is soluble salt. A solution of Calcium bi carbonate is clear, because the calcium and bicarbonate are present as atomic sized ions which are not large enough to reflect light .Some soluble minerals impact the colour to the solution .Soluble iron salts produce pale yellow or green solution ; some copper salts form instantly blue solution . Although coloured, this solution are clear .Suspended solid are substance that are not completely soluble in water and are present as particles. These particles usually impart a visible turbidity to the water. Dissolve and suspended solids are present in most surface waters. Sea water is highly insoluble sodium chloride; suspended sand make silt make it slightly cloudy.

### Material and Method:

All the chemicals and micro- plates used for this work were issued from the pharmaceutical chemistry lab of Y.B. Chavan College of Pharmacy; Aurangabad Maharashtra .The water sample used for the following work was collected as follows

SR.NO	TYPES OF WATER SAMPLE	SITE OF COLLECTION
1	BORE WELL	AURANGPURA
2	FILTERED TAP	RAUZA BAGH
3	TAP WATER	CANTONMENT BOARD AREA

4	<b>INDUSTRIAL WATER</b>	VIDEOCON COMPANY , PAITHAN ROAD
5	<b>HOUSEHOLD WATER</b>	OSMANPURA
6	<b>WORKSHOP WATER</b>	NADIR ENTERPRISES AURANGABAD

### Quality Analysis of water:

**1) Test for Lead:** 1 drop of aqueous or alkaline was taken and 1 drop of dithiazole was added. No brick red complex should be observed.

**2) Test for Bismuth:** 1 drop of fairly acidic solution was taken then 1 drop of thiourea was added with 1 drop of dilute  $\text{HNO}_3$ . No change in colour should be observed.

**3) Test for Copper:** i) 1 drop of weakly acidic solution was taken and 1 drop of rubiamic acid. No change in colour should be observed.

ii) 1 drop of slightly acidic solution was mixed with 4 drops of ammonium hydroxide. No change in colour should be observed.

**4) Test for Aluminum:** 1 drop of aqueous solution was added with 1 drop Aiumiion. No bright red colour should be observed.

**5) Test for Iron: i) Ferric Ions:** 1 drop of test solution was mixed with 1 drop of  $\text{K}_3\text{Fe}(\text{CN})_3$ . Colour change should not be observed. ii) FERRIC ION: 1 drop of test solution was added wit 1drop of  $\text{HNO}_3$  and 1drop KCNS. Blood red colour should not observe.

**6) Test for Nickel:** 1 drop of test solution was added with 1 drop of  $\text{NH}_4\text{OH}$  and Dimethylglyoxime. No change in colour should be observed.

**7) Test for Barium:** 1 drop of test solution was mixed with sodium rhodizoate. Then 1 drop of HCL after 2 minutes. It should not show change in colour.

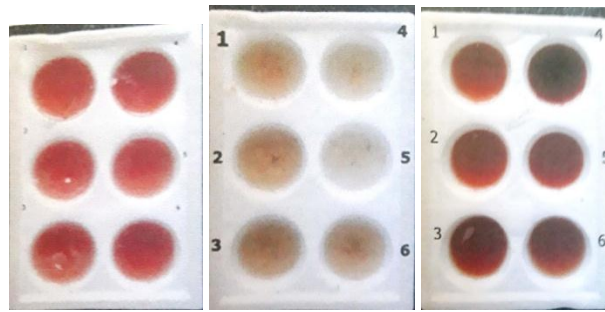
**8) Test for Ammonium:** 1 drop of test solution were mixed with 1 drop of dilute NaOH and 1 drop of Nessler's reagent. It should not show any change in colour.

### Result and Discusses:

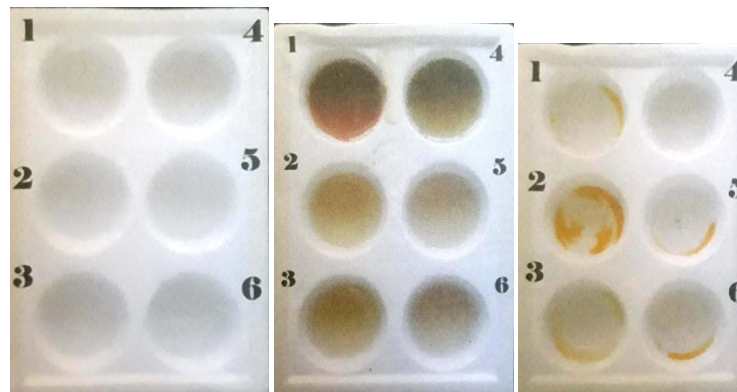
TEST	BOREWELL WATER	FILTERED WATER	TAP WATER	INDUSTRIAL WATER	WORKSHOP WATER	HOUSEHOLD WATER
1) LEAD	+	+	+	+	+	+
2) BISMUTH	-	-	-	-	-	-
3) COPPER	-	-	-	-	-	-
4)ALUMINIUM	+	+	+	+	+	+
5)IRON	+	-	+	+	-	+
6)NICKEL	-	-	-	-	-	-
7)BARIUM	+	+	-	-	+	+
8)AMMONIUM	+	-	+	+	-	-

(+) indicate the presence

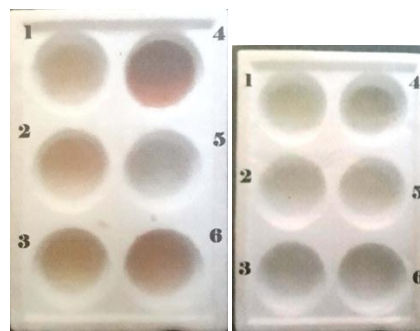
(-) indicate the absence



(1) (2) (3)



(4) (5) (6)



(7) (8)

**FIGURE: (1) TEST FOR LEAD, (2) TEST FOR BISMUTH, (3) TEST FOR ALUMINIUM, (4) TEST FOR NICKEL, (5) TEST FOR AMMONIUM, (6) TEST FOR BARIUM, (7) TEST FOR IORN, (8) TEST FOR COPPER.**

The micro- plate had six cavities and each cavity had water sample as followed: (1) Bore well water, (2) Filtered water, (3) Tap water, (4) industrial water, (5) Work – shop water, (6) House – hold water. The test for various impurities was performed and it was observed that the lead and aluminum was present in all type of water. Barium shows its presence in bore- well, filtered, tap and house hold water. Whereas, ammonium and iron were presence in bore- well, tap and industrial water respectively. The barium, ammonium and iron were presence in limited quantity.

**Conclusion:**

The work entitled 'MICROANALYSIS OF WATER' was performed by collecting the six different sample form different areas. The chemical analysis was performed for various water impurities such as lead, iron, aluminum, etc. The presence of such impurities may lead to sever disease conditions. So, the work give an idea about the impurities which are present in water others than soiled and visible impurities.

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