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## RESEARCH ARTICLE

### QUALITATIVE ANALYSIS OF WATER SAMPLES COLLECTED FROM DIFFERENT LOCATIONS OF JAIPUR, RAJASTHAN, INDIA

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#### ABSTRACT

Present study was carried out to determine the quality of different water samples using various parameters *i.e.* pH, Total hardness, Residual chlorine, Conductivity, Chloride ion concentration, Dissolved oxygen, Acidity, Alkalinity, Total Dissolved Solids, Free Carbon Dioxide and Fluoride ion concentration. pH of different water samples were ranged from 7.09-8.06. Total Hardness varied from 1666-66.66 mg/l. Variation in conductivity was from 0.400-1.000. Chloride ion concentration ranged between 71.0-1056.2 mg/l. Variation on dissolved oxygen contents were between 0.6-1.0 mg/l. Acidity and alkalinity of different samples varied from 12.5-37.5 and 300-1125 mg/l. Total dissolved solids and fluoride content ranged between 0.01-0.03 mg/l and 0.111-0.610 mg/l respectively. Although there is no variations found in case of Residual chlorine and free carbon dioxide amount.

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#### INTRODUCTION

Water is an important molecule to regulate various metabolic activities inside the human body. Although water is present in huge quantity in earth but the quantity of potable water is very less as compared with original one. Increasing population and urbanization deteriorate the quality of water. Quality of water depends on large number of physico-chemical parameters (Reddi *et al.*, 1993). Qualitative analysis refers to the assessment of various components present in the water. Qualitative analysis of water is very important process because reservoirs are used for water supply to domestic as well as industrial purposes (Jakher and Rawat, 2003). Impurities in water sample can impart undesirable taste and odor (Ramirez *et al.*, 2010). Presence of high amount of chloride in water is an indication of contamination from residual chloride of urine (Armon and Kott, 1994). Contamination of water results in to serious health hazards. Improper handling and management cause problems in potability and availability of water (Subba Rao and Subba Rao, 1995). Positive correlation has been reported between contaminated level of water and the health of aquatic organisms (Kuehn *et al.*, 1995). Water supply to fulfill the daily requirement must be free from any kind contamination (Bruvold and Ongerth 1969; Oteze, 1993).

#### MATERIALS AND METHODS

##### Sample collection

Water samples were collected from Vidyadhar Nagar (Sample1), Kishan Pole (Sample-2), Tonk Road (Sample-3), Mansarover (Sample-4), Sindhi camp (Sample-5) and Rampura (JECRC University) (Sample-6).

##### Objectives

Qualitative analysis of different water samples were started with following objectives.

- pH
- Hardness
- Residual Chlorine
- Conductance
- Chloride
- Dissolved oxygen
- Acidity
- Alkalinity
- Total Dissolved Solids
- Free Carbon Dioxide
- Fluoride

##### Chemicals

EDTA, Eriochrome black-T (EBT), Ethanol, Sodium Thiosulphate, Glacial Acetic acid, Potassium Iodide, Starch,

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Anhydrous Potassium Chloride, AgNO<sub>3</sub>, K<sub>2</sub>Cr<sub>2</sub>O<sub>4</sub>, Manganous Sulphate, Alkaline Iodide Azide reagent, Concentrated Sulphuric acid, Methyl Orange, Phenolphthalein indicator, NaOH, HCl, Zirconyl Chloride octahydrate and Anhydrous Sodium Fluoride were of analytical grade and obtained from Hi-Media Pvt. Ltd., Mumbai and Qualigens (Fisher Scientific).

**pH**

Dipped the pH paper strip in the water samples. Observe the change in colour and compared with wrapper provided in pH book.

**Hardness**

Hardness of different water samples was determined by following Aneja, 2003.

**Residual Chlorine**

Presence of residual chlorine was determined using Aneja, 2003.

**Conductance of water samples**

Conductivity cell was rinse with distilled water and buffer solution three times. Temperature range was 25 °C. Standardization was done using buffer solution (50 ml) and final observations were recorded using water samples instead of buffer solution.

**Dissolved Oxygen**

Dissolved oxygen in different water samples was observed using Aneja, 2003.

**Other parameters**

Other parameters such as Alkalinity, Total Dissolved Solids, Free Carbon Dioxide and Fluoride content was determined using Purewal *et al.*, 2014 and Aneja, 2003.



**b. Kishan Pole**



**c. Tonk road**



**d. Mansarovar**



**a. Vidyadhar Nagar**



**e. Sindhi camp**





f. Rampura

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Table 1. Physico-chemical properties of different water samples.

Chemical Analysis	Sample-1	Sample-2	Sample-3	Sample-4	Sample-5	Sample-6
pH	7.56	7.51	7.09	8.06	7.36	7.43
Total Hardness (ppm)	16.67	16.66	25	50	25	66.66
Residual Chlorine (ppm)	0	0	0	0	0	0
Conductivity	0.461	0.400	0.408	0.562	0.447	1.000
Chlorides (mg/l)	120.7	106.5	156.2	113.6	92.3	71.0
D.O (mg/l)	1	0.6	1	0.8	1	0.6
Acidity (mg/l)	12.5	12.5	25	12.5	12.5	37.5
Alkalinity (mg/l)	375	400	300	400	625	1125
Total Dissolved Solids (mg/l)	0.02	0.02	0.03	0.02	0.01	0.03
Free CO <sub>2</sub> (mg/l)	22	22	22	22	22	22
Fluoride (mg/l)	0.610	0.237	0.218	0.111	0.21	0.228

## RESULTS AND DISCUSSION

pH refers to the intensity of the acidic or alkaline condition of a solution (Murhekar, 2011). As shown in Table-1 pH of sample-3 was lowest and of sample-4 was highest. Total hardness was found to be lowest in sample-2 (16.66 mg/l) and highest for sample-6 (66.66 mg/l). Value for residual chlorine was negative for all the samples. Conductivity was lowest in sample-2 (0.400) and highest for sample-6 (1.000). Value of chloride was minimum for sample-6 (71.0 mg/l) and maximum for sample-3 (156.2 mg/l). Dissolved oxygen was found to be lowest for sample no. 2 and 6 (0.6 mg/l) and highest for sample-1, 3 and 5 (1.0 mg/l). Value of acidity was minimum in case of sample-1, 2, 4, 5 (12.5 mg/l) and maximum for sample-5, 6 (37.5 mg/l). Alkalinity was lowest in sample-3 (300 mg/l) and highest in sample-6 (1125 mg/l). Total Dissolved Solids was minimum in sample-5 (0.01 mg/l) and maximum for sample-3, 6 (0.03 mg/l). Values of free carbon dioxide were same for all the samples (22 mg/l) and fluoride content was minimum for sample-4 (0.111 mg/l) and maximum for sample-1 (0.610 mg/l).

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