



Correlation Coefficient: Analysis of Well Water from rural area Jalkot, Tal. Tuljapur MS India

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Abstract:

The Physicochemical analysis of the effluents (waste) of the Jalkot well water sample has been carried out in the present investigation as per the methods recommended by APHA, WHO, ICMR, Present sample is highly contaminated by the presence of organic and inorganic salt above the permissible limit suggested by the International Standards. It shows a large deviation from the view of the correlation coefficient.

Key words:

Jalkot well water sample, pH meter, Conductometer, Titration method and Gravimetric method and Correlation Coefficient.

Introduction:

The water is being polluted and thus human life is adversely affected. The high levels of pollution are mainly due to 1) Modernization, 11) urbanization 111) Industrialization and IV) Overcrowding. So water is being highly polluted. Yet no physicochemical studies are reported from this present region water sample, therefore, this sample is selected for analysis, in order to use for irrigation and maybe to a certain extent for drinking purposes also.

Method and Materials:

The sample Selected physicochemical analysis belongs to Groundwater pollution, consequently irrigation purposes and harmful to the health of Human being as well. The pH and conductance value of the sample is determined with the help of a pH-meter and conductometer, while alkalinities, hardness, sulfates, chlorides, calcium, COD, and Carbon Dioxide are analyzed by means of Titration methods, while TDS is calculated by the Gravimetric method.

Observation Table: 1

Sr. No	Parameter (Mg/L)	Winter 2020	Summer 2020	Rainy 2020	Winter 2021	Summer 2021	Rainy 2021
1	pH	7.17	6.85	7.23	6.57	6.29	6.10
2	Conductance	1.22	1.30	1.33	1.13	1.37	1.40
3	Carbon Dioxide	11.90	11.53	11.43	11.63	11.13	11.08
4	Total Dissolved Solids	650	700	362	725	760	780
5	Alkalinity	364	390	314	430	462	470
6	Hardness	290	300	515	340	548	550
7	Sulphates	45	50	35	43	52	25
8	Chlorides	106	120	115	131	176	185
9	COD	38	47	23	43	48	28

Values of Correlation Coefficient of Jalkot Well Water Sample:**Observation Table: 2**

Sr. No	X- (Parameter)	Y- (Parameter)	P- value	Covariance	Statistic	Correlation Coefficient Value (r)
1	pH	Hardness	0.4588	- 0.01764	- 0.819	- 0.3789
2	pH	Hardness				
3	pH	Hardness				
4	pH	Hardness				
5	pH	Hardness				
6	pH	Hardness				

Observation Table: 3

Sr. No	X- (Parameter)	Y- (Parameter)	P- value	Covariance	Statistic	Correlation Coefficient Value (r)
1	TDS	Hardness	0.867	- 1735.0333	- 0.1786	- 0.8893
2	TDS	Hardness				
3	TDS	Hardness				
4	TDS	Hardness				
5	TDS	Hardness				
6	TDS	Hardness				

Result and Discussion:

From this, it is found that the Jalkot well water sample is found belongs to Excellent Class-II throughout the considered season. The sample shows the minimum quantity of TDS 362 mg/L and a maximum 780 mg/L. IS-10500 suggests the permissible limit of alkalinity for drinking purposes up to 200 mg/L, while USPH standards 250 mg/L. This sample is found to show a value of alkalinity minimum 314 mg/L and a maximum 470 mg/L. This shows that this sample is giving little respect to USPH. The observed quantity of Chloride is found within the range 106-185 mg/L, while USPH suggests IS-10500 as well as a permissible limit for chlorides up to 250 mg/L for drinking purposes. This shows that the quantity of chloride found is within the range compared to the given standards. The recorded value of Sulphates is found within the range 25-52 mg/L., while IS-10500 is suggesting the standard limit of Sulphates for drinking purposes 150 mg/L, while USPH and WHO are suggesting the standard limits of Sulphates for drinking purposes are 250

mg/L. This shows that the quantity of sulfate found is very less as compared to the given standards. IS 10500 suggests the permissible limit for hardness mg/While WHO relaxes the permissible limit up to 500mg/L, but the recorded values are between 290 to 550 mg/L. This shows that the quantity of hardness compared to given standards is near the desired range. The nature of this sample water is found hard. This shows that the sample gives slight respect to IS-10500, but fails to respect the WHO. The recorded quantity of COD is ranging from 23 mg/L 48 mg/L. The quantity of Conductance is found within 1.13 mmoh/cm to 1.40 mmoh/cm. The value of pH is ranging from 6.10 to 7.23. World Health Organization (WHO) suggests the permissible limit for drinking quality within 6.5-8.5. IS-10500 also suggests the permissible limit of pH for drinking purposes within (6.5-8.5). This shows that this sample respect to above said the recorded value of Carbon Dioxide is ranging from 11.8 ml/L to 11.90 ml/L.

Conclusion:

On the basis of the above discussion, it can be concluded that in average all the parameters show the remarkable positive and negative deviation from suggested standard limits (WHO & IS-OS00). Hence this water sample is found not suitable for drinking purposes. With respect to the values of pH and Hardness, result of the Pearson correlation indicated that there is a very small negative relationship between X and Y. With respect to the values of TDS and Hardness, the result of the Pearson correlation indicated that there is a non-significant very small negative relationship between X and Y.

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