

# Physico-Chemical Analysis of Well Water and Sea Water in Ramanathapuram Selected Rural Area

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**Abstract:** Water is the most precious natural resource after air. Though the surface of the earth is mostly consists of water, only a small part of it is usable, which makes this resource limited. This precious and limited resource, therefore, must be used with care. As water is required for different purposes, the suitability of it must be checked before use. The present study is focused on the determination of physico-chemical parameters, such as pH, dissolved oxygen, chlorides, alkalinity, hardness, MLSS, TDS, of water samples from different sampling points. That is used to analyzing the water quality.

**Keywords:** Physico-chemical analysis, pH, Quality analysis, Water sample.

## 1. Introduction

Water is nature's most wonderful, abundant and useful compound. It is important to all living organism, most ecological systems, human health, food production and economic development. The safety of drinking water is affected by various contaminants which includes chemical and microbiological. Such contaminants cause serious health problems.

Due to these contaminants quality of the drinking water becomes poor. Sometimes such poor quality water cause many disease in the humans, so that quality of water must be tested for both the chemical as well as for the microbial contaminant's. The 5 major application of water are hydropower, Domestic uses, irrigation, Industrial uses, and Commercial uses. The major water quality parameter considers for the examination in this study are pH, TDS, MLSS, Hardness, Dissolved oxygen, Alkalinity.

## 2. Sample collection

Water sample was collected from 10 different Ramanathapuram rural area well water and 5 sea water.

## 3. Materials and methods

### A. Dissolved oxygen

This method is used to determination of strength of dissolved oxygen present in the water sample.

No	ITEM	TITRATION
1	Burette solution	Sodium thiosulphate
2	Pipette solution	20ml water sample
3	Reagents to be added	2ml MnSO <sub>4</sub> + 2ml alkali iodide+ 2ml con.CH <sub>2</sub> SO <sub>4</sub>
4	Indicator	Starch
5	End point	Blue to colorless
6	Formula	Amount of DO=8*Ng/l

### B. Chlorides

This method is used to determination of strength of chlorides present in the water sample.

No	ITEM	TITRATION
1	Burette solution	AgNO <sub>3</sub>
2	Pipette solution	20ml of water sample
3	Reagents to be added	-
4	Indicator	K <sub>2</sub> CrO <sub>4</sub>
5	End point	Yellow to reddish brown
6	Formula	Amount of chloride=35.46*n g/l

### C. pH

Confirm the pH meter in the measurement mode. Thoroughly rinse the pH electrode between measurements with distilled water to prevent carryover contamination of the tested water

Table 1

S.No.	Water quality test	Description	Instrument/method	Name of the method
1.	Dissolved oxygen	The amount of oxygen available in the water	Titrimetric method	Winkler's Method
2.	Chloride	Measurement of chloride amount in water	Titrimetric method	Mohr's method
3.	pH	The major of acidity in the water.	pH meter	Electrometric method
4.	Alkalinity	Alkalinity of water is its quantitative capacity to with a strong acid to a designated pH	Titrimetric method	
5.	Hardness	Measurement of and magnesium and calcium in the water.	Titrimetric method	EDTA method
6.	TDS	The measurement of the amount of particulate solids in the water.	Boiling method	-

sample solution. Dip the pH electrode into a testing water sample the pH is completed when the pH reading is stable.

D. Alkalinity

No	ITEM	TITRATION
1	Burette solution	Hcl
2	Pipette solution	20ml water sample
3	Reagents to be added	-
4	Indicator	a). Phenolphthalein and b).methyl orange
5	End point	a) Pink to colorless and b) yellow to red orange
6	Formula	Amount of $OH^-$ , $CO_3^{2-}$ , $HCO_3^- = 50 * Ng/l$

E. TDS

First took a 250 beaker. Record the weight of empty beaker (w1) after 100ml sample water taken a 250 beaker evaporates the water using the hot plate. Cool the beaker to room temperature and weight (w2)

Formula of TDS:  $TDS = \frac{w2-w1}{100} * 10^6$  ppm

F. Hardness

No	ITEM	TITRATION	
		Total hardness	Permanent hardness
1	Burette solution	EDTA	EDTA
2	Pipette solution	20ml of water sample	20ml of boiled water sample
3	Reagents to be added	5ml ammonia buffer	5ml ammonia buffer
4	Indicator	EBT	EBT
5	End point	Wine red to steel blue	Wine red to steel blue
6	Formula	$1000v_2/v_1$ mg/l	$1000v_3/v_1$ mg/l

4. Well water and sea water analysis result

S.NO OF AREA	NAME OF THE AREA
1.	Kilakarai (Bharathi nagar)
2.	Ramnad (collectorate)
3.	Ramnad (Gandhi nagar)
4.	Bogalur
5.	Erwadi
6.	Mayakulam
7.	Uttarakosamangai
8.	Devipattinum
9.	Paramakudi
10.	Rameshwaram
11.	Mayakulam Sea
12.	Devipattinum Sea
13.	Valinokkam Sea
14.	Rameshwaram Sea
15.	Kilakarai Sea

5. Conclusion

Water is most important in our world. So we must maintain the water quality.in the present study is focus the analysis value of water quality parameter such as pH, alkalinity, hardness, dissolved oxygen, chloride, and DTS, from all well and sea water sample collected from ramanathapuram rural area. Well water and sea water contain pH range 7.5-8.5. Well water contains medium level of chloride and the sea water contains high level of chloride. Well and sea water contain hydroxide, carbonate, and bi carbonate alkalinity most of the sea water contain hydroxide alkalinity.

S.No of area	Hardness			Chloride (ppm)	TDS (ppm)	pH	Alkalinity(ppm)			Disso lved Oxyg en
	Permane nt	Total	Temporary				$OH^-$	$CO_3^{2-}$	$HCO_3^-$	
1										
2	783	1003	220	465.7	3858	7.72	170	961.9	-	
3	395	447	52	255.02	699	7.43	-	441	762	24.32
4	421	567	146	96.73	3158	7.84	-	546	196	35.2
5	229	391	162	215.45	3319	7.72	-	621.4	561.8	28.8
6	147	449	382	397.93	812	8.1	-	592.4	563.7	46.08
7	765	867	102	766.184	1778	8.16	536.1	731.5	-	30.4
8	324	657	333		4543	7.56	186.3	729.6	-	39.36
	385	577	192	245.134	689	7.92	-	998.5	278.1	41.6
9	521	647	126	749.695	2110	7.43	-	982.5	804.1	23.04
10	761	912	151	864.96	361	7.60	254.6	845.9	-	26.88
11	780	1156	376	-	23055	7.83	341.4	362.1	-	32.8
12	874	1024	150	-	24774	7.74	421.1	-	-	23.36
13	871	964	93	-	21355	7.86	275.2	-	-	22.08
14	810	1104	294	-	25678	7.74	2125	985	-	20.48
15	324	527	203	-	23647	7.95	2976	743	-	25.65

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