

LAB - 6: MEASUREMENT OF TOTAL DISSOLVED SOLIDS (TDS) IN DIFFERENT WATER SAMPLES

7.1 Introduction:

TDS EC meter is used to quickly, simply, accurately, and economically measure the water hardness (total calcium + magnesium) in aqueous solutions.

7.2 Equipment:

Glass beakers – 100ml, TDS meter

7.3 Chemicals Required:

Surface water, ground water and potable water

7.4 Principle:

Dissolved solids" refer to any minerals, salts, metals, cations, or anions dissolved in water. Total dissolved solids (TDS) comprise inorganic salts (principally calcium, magnesium, potassium, sodium, bicarbonates, chlorides, and sulfates) and some small amounts of organic matter that are dissolved in water. In general, the total dissolved solids concentration is the sum of the cations (positively charged) and anions (negatively charged) ions in the water. Therefore, the total dissolved solids test provides a qualitative measure of the amount of dissolved ions but does not tell us the nature or ion relationships

S. No	Type of Water	TDS (ppm)
1	Potable (drinking)	100
2	Surface (river or lake)	500
3	Ground (bore well)	2000

7.5 Procedure:

Distilled water for solution and standard preparation

7.5.1 Water hardness standard, 1000 ppm Mg^{2+} :

To prepare this standard, add 2.46 g of reagent-grade magnesium sulphate heptahydrate ($\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$) to a 1 L volumetric flask about half full of distilled water. Swirl the flask to dissolve the solid and fill to the mark with distilled water. Cap the flask and invert several times to mix the solution

7.5.2 PROCEDURE

Connect the instrument to TDS meter and allow the instrument to calibrate up to 10 min.

Take the different sources (Distilled, Lake, Well, and Potable) water samples. From each water sample pipette out 40 ml transfer to 100 ml beaker. Use conductivity electrode for measurement of total dissolved salt (TDS) in ppm present in each water sample. The results of the water sample TDS depicted in the following table.

S.No	Different samples of water	TDS (in ppm)
1	1000 ppm MgSO_4	
2	Distilled water	
3	Tap water	
4	Lake water	
5	Potable water	

Units of Measurement 1

Water hardness concentrations are measured in units of parts per million as calcium, parts per million as CaCO_3 , grains of hardness, moles per liter, or any other convenient concentration unit.

Direct Measurement of Water Hardness (using an ion meter)

By serial dilution of the 0.1M, 1000 ppm, or 100 ppm calcium standard, prepare two calcium standards whose concentration is near the expected sample concentration of different water types. Measure out 100 ml of each standard into individual 150 ml beakers.

7.6 Result:

The TDS for MgSO_4 water is _____ppm

The TDS for Distilled water is _____ppm

The TDS for Tap water is _____ppm

The TDS for Lake water is _____ppm

The TDS for Potable water is _____ppm