

Aim: Determine the Total dissolved solids (TDS) of given water samples.

Introduction: Water is a good solvent and picks up impurities easily. Pure water - - tasteless, colorless, and odorless is often called the universal solvent. 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

An elevated total dissolved solids (TDS) concentration is not a health hazard. The TDS concentration is a secondary drinking water standard and, therefore, is regulated because it is more of an aesthetic rather than a health hazard. An elevated TDS indicates the following:

- 1)The concentration of the dissolved ions may cause the water to be corrosive, salty or brackish taste, result in scale formation, and interfere and decrease efficiency of hot water heaters; and
- 2)Many contain elevated levels of ions that are above the Primary or Secondary Drinking Water Standards, such as an elevated level of nitrate, arsenic, aluminum, copper, lead, etc.

Requirements:

Water sample to be tested

Evaporating Dish/ Ceramic Dish

Desiccator

Whatman Filter paper

Electric balance machine

Procedure:

1. Filter your water sample through a Whatman Filter paper.
2. Collect the filtrate (liquid) and rinse water in a flask.
3. Take the weight of empty container (ceramic dish/ evaporating Dish). Make sure the container should be dried.
4. Add the filtrate to the container and allow the sample to stay in the oven at 103°C for 24 hours. If possible, increase the temperature of the drying oven to 180°C and allow the sample to dry for up to 8 hours.
5. Remove the container - Remember it is very hot. After removing from the drying oven, the sample should be placed in a desiccator to cool in a dry air environment for at least 3 to 4 hours.
6. After the container cools, reweigh the container at least three times.
7. Subtract the initial weight (in grams) of the empty container from the weight of the container with the dried residue to obtain the increase in weight. Then do the following:
 - A- Weight of clean dried container (gm)
 - B- Weight of container and residue(gm)
 - C- Volume of Sample (ml)Concentration (mg/L) = $((B - A) / C) * (1000 \text{ mg/g}) * (1000 \text{ ml/L})$

For example:

A=100.0001gm

B=100.0020gm

C=100ml

Concentration (mg/L) = $((100.0220 - 100.0001) / 100) * 1000 * 1000 = 219 \text{ mg/L}$

Precautions:

1. If the sample cooled in a moist environment, the sample would increase in weight because of the addition of water vapor from the air.
2. Remember the sample is very hot and can melt plastic.
3. Do not touch container with bare hands.