

Solids, residue on evaporation at 105°C, total, gravimetric

Parameter and Code:

Solids, residue on evaporation at 105°C, total, I-3750-85 (mg/L): 00500

1. Application

1.1 This method may be used to determine the total-solids concentration of any natural or treated water or industrial waste.

1.2 Total residue represents the sum of both dissolved and suspended (including colloidal) material in a sample. The determination is not exact, because of the compromise that must be made in selecting the temperature at which the evaporated residue is to be dried. At temperatures sufficient to release water of hydration of the hydrated salts that form on evaporation, there is risk of volatilization of the more volatile dissolved or suspended materials in the sample. On the other hand, drying at a sufficiently low temperature to conserve volatiles fails to remove much of the entrapped water and ordinary water of hydration. Because of these factors, the determination must be considered as providing only an approximation of the sum of dissolved and suspended matter.

1.3 The determination is not very useful; determination of dissolved solids (method I-1749) and suspended solids (method I-3765) provides more useful information.

2. Summary of method

A volume of well-mixed sample is evaporated to dryness. The residue is dried at 105°C for 2.0 h, cooled in a desiccator, and immediately weighed.

3. Interferences

Care must be taken to ensure that a representative sample is provided. Usually, large, floating particles are excluded from the sample.

4. Apparatus

4.1 *Desiccator*, charged with indicating silica gel or other efficient desiccant.

4.2 *Oven*, 105°C, uniform temperature throughout.

4.3 *Platinum evaporating dishes*, 75- to 125-mL capacity, weighing less than 50g, or zirconium dishes. Platinum or zirconium is recommended because the change in weight of glass or porcelain dishes may introduce appreciable error into the determination.

6. Procedure

6.1 Shake the sample vigorously and rapidly pipet a suitable aliquot of unfiltered sample.

6.2 Transfer the sample to a tared platinum evaporating dish.

6.3 Rinse the pipet with demineralized water to ensure transfer of all particulate matter to the evaporating dish.

6.4 Evaporate the sample just to dryness on a steam bath.

6.5 Dry in an oven at 105°C for 2.0 h.

6.6 Cool in a desiccator and immediately weigh. Record the weight to the nearest 0.1 mg.

7. Calculations

$$\text{Total solids (mg/L)} = \frac{1,000}{\text{mL sample}} \times \text{mg residue}$$

8. Report

Report solids, residue on evaporation at 105°C, total (00500), concentrations as follows:

less than 1,000 mg/L, whole numbers; 1,000 mg/L and above, three significant figures.

9. Precision

It is estimated that the percent relative standard deviation of this method is greater than 8 percent at 59 mg/L and greater than 3 percent at 1760 mg/L.

References

U.S. Environmental Protection Agency, 1979,
Methods for chemical analysis of water and
wastes: Cincinnati p. 160.3.