

Density, gravimetric

Parameter and Code:
Density I-1312-85 (g/mL at 20°C): 71820

1. Application

This method may be used to determine the density of any water from which the suspended sediment has been satisfactorily removed.

2. Summary of method

The density determination is based on the weight of a carefully measured volume of filtered sample at a given temperature. Densities are determined at 20°C, the same temperature at which volumetric glassware is calibrated.

3. Interferences

The only significant interference with this method is suspended sediment, which may usually be removed by filtration, centrifugation, or flocculation. Precautions should be taken to minimize evaporation during removal of sediment.

4. Apparatus

4.1 *Pipet*, volumetric, 50 mL calibrated: The actual volume delivery of the pipet is determined by weighing a delivering volume of demineralized water at 20°C. The volume is obtained from relative-density tables in handbooks. Alternatively, 50-mL pycnometer can be used; it must also be calibrated.

4.2 *Water bath*, constant temperature, 20 + 0.5 °C.

4.3 *Weighing bottle*, 50-mL capacity.

5. Reagents

None required.

6. Procedure

6.1 Adjust the temperature of the filtered sample to 20.0°C.

6.2 Using a previously calibrated 50-mL pipet, transfer the sample to a tared weighing bottle.

6.3 Stopper the bottle immediately to prevent water loss by evaporation.

6.4 Weigh the solution to the nearest 0.1 mg.

7. Calculations

7.1 Determine density as follows:

$$\text{Density} = \frac{\text{g sample}}{\text{mL sample}}$$

7.2 If a constant-temperature bath is not available, the determination can be made at the sample temperature and a correction applied for the departure from 20°C. The temperature is recorded with an accurate thermometer, and the relative density for that temperature obtained from a table. The density result is then corrected by the factor:

$$\frac{\text{Relative density (20°C)}}{\text{Relative density (test temperature in °C)}}$$

8. Report

Report density (71820) to three decimal places in terms of grams per millimeter at 20 °C.

9. Precision

Precision data are not available for this method, but results are believed reproducible to + 0.005 g/mL.