



Designation: D 859 – 9400

Standard Test Method for Silica in Water ¹

This standard is issued under the fixed designation D 859; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This test method covers the determination of silica in water and waste water; however, the analyst should recognize that the precision and accuracy statements for reagent water solutions may not apply to waters of different matrices.

1.2 This test method is a colorimetric method that determines molybdate-reactive silica. It is applicable to most waters, but some waters may require filtration and dilution to remove interferences from color and turbidity. This test method is useful for concentrations as low as 20 µg/L.

1.3 This test method covers the photometric determination of molybdate-reactive silica in water. Due to the complexity of silica chemistry, the form of silica measured is defined by the analytical method as molybdate-reactive silica. Those forms of silica that are molybdate-reactive include dissolved simple silicates, monomeric silica and silicic acid, and an undetermined fraction of polymeric silica.

1.4 The useful range of this test method is from 20 to 1000 µg/L at the higher wavelength (815 nm) and 0.1 to 5 mg/L at the lower wavelength (640 nm). It is particularly applicable to treated industrial waters. It may be applied to natural waters and wastewaters following filtration or dilution, or both. For seawater or brines, this test method is applicable only if matched matrix standards or standard addition techniques are employed.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—For many natural waters, a measurement of molybdate-reactive silica by this test method provides a close approximation of total silica, and, in practice, the colorimetric method is frequently substituted for other more time-consuming techniques. This is acceptable when, as frequently occurs, the molybdate-reactive silica is in the *milligram* per litre concentration range while the nonmolybdate-reactive silica, if present at all, is in the microgram per litre concentration range.

1.6 Former Test Method A (Gravimetric—Total Silica) was discontinued. Refer to Appendix X1 for historical information.

2. Referenced Documents

2.1 ASTM Standards:

¹ This test method is under the jurisdiction of ASTM Committee D-19 on Water and is the direct responsibility of Subcommittee D19.05 on Inorganic Constituents in Water. Current edition approved May 15, 1994; June 10, 2000. Published July 1994; September 2000. Originally published as D 859 – 45 T. Last previous edition D 859 – 8894.