Designation: D 4795 – 94 (Reapproved 1998)

Standard Test Method for Nitrogen Content of Soluble Nitrocellulose—Alternative Method[1]

This standard is issued under the fixed designation D 4795; 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.

1. Scope

1.1 Test Methods D 301 for measuring nitrogen content in nitrocellulose by nitrometer are the accepted standard. However, the glassware is specialized and the precision is dependent on the development of a high level of skill by the operator. The ferrous-sulfate titration of nitrate is a classical procedure. By controlling critical variables and automating the actual titration, precision equivalent to the nitrometer can be achieved with nitrocellulose. This test method describes such a procedure.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *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.* For specific hazard statements, see Section 8.

2. Referenced Documents

2.1 *ASTM Standards:*

D 301 Test Methods for Soluble Cellulose Nitrate[2]

D 1193 Specification for Reagent Water[3]

3. Summary of Test Method

3.1 A weighed specimen of nitrocellulose is dissolved in sulfuric acid and titrated automatically with ferrous sulfate. The nitrogen content of the specimen is calculated using the equivalence factor of the ferrous sulfate.

4. Significance and Use

4.1 This test method provides a simpler means for measuring the nitrogen content of nitrocellulose than the nitrometer described in Test Method D 301. Under controlled conditions, the procedure described is capable of results equivalent to those obtained by the nitrometer.

5. Interferences

5.1 The presence of moisture (or other volatile components) in the specimen will affect results. It is recommended that only thoroughly dry specimens be used.

5.2 Temperature rise must be controlled during the titration. The cooling bath provides that control. However, if the rate of titrant addition is too fast, temperature may rise out of control. Results may then be erratic. Adherence to the procedure will avoid temperature excursions. For optimum system efficiency, room temperature should be maintained at 23 ± 2°C.

5.3 The strength of the sulfuric acid used to dissolve the specimen is very important. Too low an acid strength slows the rate of solution which, in turn, causes titrations to be abnormally slow. Results then become erratic.

6. Apparatus

6.1 *Acid Bottle Safety Dispenser*.

6.2 *Brinkman 20 Titration System*, or equivalent, with 25 mL amber buret:

6.2.1 *Electrode*, platinum.

6.2.2 *Electrode*, glass.

6.3 *Desiccator*, with drying agent.

6.4 *Weighing bottles*, 12-mL capacity, aluminum (preferred) or glass.

6.5 *Analytical Balance*, accurate to ±0.1 mg.

6.6 *Ovens*—135°C, for drying standards, and 100°C, for drying specimens, having unexposed heating elements and the door latch removed.

6.7 *Circulating Unit*, for chilled water, 5 ± 2°C.

6.8 *Blender*, with 8-oz (0.25-L) blender jar.

[1] This test method is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.36 on Cellulose and Cellulose Derivatives.

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[2] *Annual Book of ASTM Standards*, Vol 06.03.

[3] *Annual Book of ASTM Standards*, Vol 11.01.