



Designation: C1318 – 15a (Reapproved 2020)

Standard Test Method for Determination of Total Neutralizing Capability and Dissolved Calcium and Magnesium Oxide in Lime for Flue Gas Desulfurization (FGD)¹

This standard is issued under the fixed designation C1318; 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 This test method covers analysis of magnesian, dolomitic and high-calcium limes for total neutralizing capability and dissolved major oxides. Dissolved calcium and magnesium are the major species that neutralize acid under the conditions of the test.

1.2 The test conditions are chosen to measure the acid-neutralizing capacity of both calcium hydroxide and magnesium hydroxide contained in slaked lime. By controlling the neutralization pH at 6, magnesium hydroxide and magnesium oxide are titrated in addition to calcium hydroxide fraction.

1.3 This test method also determines the fraction of Mg ions present in the lime that will dissolve under lime flue gas desulfurization (FGD) conditions. Because the Mg^{2+} ion alters FGD performance, it is important to know its concentration.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This test method is under the jurisdiction of ASTM Committee C07 on Lime and Limestone and is the direct responsibility of Subcommittee C07.05 on Chemical Tests.

Current edition approved Dec. 1, 2020. Published January 2021. Originally approved in 1995. Last previous edition approved in 2015 as C1318 – 15a. DOI: 10.1520/C1318-15AR20.

2. Referenced Documents

2.1 ASTM Standards:²

C25 Test Methods for Chemical Analysis of Limestone, Quicklime, and Hydrated Lime

C51 Terminology Relating to Lime and Limestone (as Used by the Industry)

C110 Test Methods for Physical Testing of Quicklime, Hydrated Lime, and Limestone

C1301 Test Method for Major and Trace Elements in Limestone and Lime by Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP) and Atomic Absorption (AA)

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

3. Terminology

3.1 Definitions:

3.1.1 Unless otherwise specified, for definitions of terms used in these test methods refer to Terminology C51.

4. Summary of Test Method

4.1 Lime is slaked by boiling and is reacted with acid at a pH and residence time similar to those found in full-scale FGD reaction tanks.

4.2 A sample of lime is titrated with 1N hydrochloric acid, maintaining a pH of 6 for 30 min. After 30 min, the acid consumption is recorded. The total neutralizing capacity is calculated from the acid consumption and reported as % CaO. Dissolved magnesium is determined by spectrometry or by EDTA titration and reported as percent dissolved Magnesium Oxide (as MgO).

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.