



Standard Test Method for Silica—pH Value¹

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1. Scope

1.1 This test method is used to measure the pH of a 5 % silica/water suspension or mechanical dispersion and is indicative of the relative acidity or alkalinity of the silica.

1.2 The values stated in SI units are to be regarded as the standard.

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.*

2. Referenced Documents

2.1 ASTM Standards:

E 70 Test Method for pH of Aqueous Solutions with the Glass Electrode²

3. Significance and Use

3.1 The pH level of silica, as measured by this test method, is known to affect the vulcanization of some rubber compounds. Refer to Test Method E 70 for a fuller understanding of pH and a more detailed procedure for making pH measurements.

4. Apparatus

4.1 *pH Meter*, (digital is recommended), having an accuracy of ± 0.05 pH and equipped with a combination electrode.

4.2 *Mortar and Pestle*.

4.3 *Beaker*, glass, 150 cm³ with watch glass.

4.4 *Magnetic Stirring Bar and Stirrer*.

5. Reagents

5.1 *Degassed, Neutral Water*. Boil a container of either distilled or deionized water for 10 min, cover, and allow to cool to room temperature, or purge the water with nitrogen gas for 20 min using a fritted bubbler.

5.2 *Buffer Solutions*, pH of 4.00, 7.00, and 10.00.

6. Procedure

6.1 Pulverize pelleted or granulated silica to a fine powder, using a mortar and pestle.

6.2 Weigh 5 g of silica to the nearest 0.1 g into a 150 cm³ glass beaker.

6.3 Add 100 cm³ of degassed, neutral water.

6.4 Cover the glass beaker with a watch glass and stir the mixture for 5 min at room temperature.

6.5 Standardize the pH meter with two buffer solutions that bracket the expected pH value of the silica. Rinse the electrode with distilled water and wipe clean after each test.

6.6 Place the electrode in the silica/water mixture, continuing to stir with the magnetic stirrer. When a constant pH is obtained, record the pH to the nearest 0.05 pH unit.

6.7 Rinse the electrode with distilled water. Store electrode in accordance with manufacturer's instructions when not in use.

7. Report

7.1 Report the following information:

7.1.1 Identification of the sample, and

7.1.2 Result obtained, reported to the nearest 0.1 unit.

8. Precision and Bias

8.1 No precision and bias study has been performed for this method.

9. Keywords

9.1 pH; silica

¹ This test method is under the jurisdiction of ASTM Committee D11 on Rubber and is the direct responsibility of Subcommittee D11.20 on Compounding Materials and Procedures.

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² *Annual Book of ASTM Standards*, Vol 15.05.