Designation: D 4654 – 87 (Reapproved 1998)

Standard Test Method for Sulfate Basicity in Leather[1]

This standard is issued under the fixed designation D 4654; 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 is intended for use in calculating the sulfate basicity of mineral tanned leather.

1.2 *This standard does not purport to address all of the safety problems, 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:*

D 2807 Test Method for Chromic Oxide in Leather (Perchloric Acid Oxidation)[2]

D 4655 Test Methods for Sulfates in Leather (Total, Neutral, and Combined Acid)[2]

3. Significance and Use

3.1 This test method is used to determine the percent of total chromic oxide that is combined with hydroxyl and may serve as a measure of chrome fixation.

4. Apparatus and Reagents

4.1 The apparatus and reagents shall be as described in Test Methods D 2807 and D 4655.

5. Sampling, Test Specimens and Test Units

5.1 The test specimen shall be as described in Test Methods D 2807 and D 4655.

5.2 Unless otherwise specified in the detail specifications, two specimens from the composite sample shall be tested.

5.3 The percent basicity of the sample for test shall be the average of the test results obtained from the specimens tested.

6. Procedure

6.1 The chromic oxide shall be determined as described in Test Method D 2807. The combined sulfate shall be determined as described in Method D 4655.

7. Calculation of Results

7.1 Express the percent basicity of the specimen according to Schorlemmer's system. In this system, the percent basicity is the percent of the total chromic oxide that is combined with hydroxyl. Conversely, the percent acidity is the percent of the total chromic acid that is combined with sulfate or other acid anions. Percent basicity is therefore 100 % acidity.

$$\text{sulfate basicity, \%} = 100 - \text{\% combined sulfate} \times 52.8/\text{\% total chromic oxide} \quad (1)$$

7.2 When other metals that form hydrolysable sulfates are present, add their equivalent percent of chromic oxide to the chromic oxide present before calculating percent basicity. Use the following conversion factors: % $Al_2O_3 \times 1.49$, % $ZrO_2 \times 0.82$, and % $Fe_2O_3 \times 0.95$.

7.3 Report the results to the nearest 0.1 %.

8. Precision and Bias

8.1 This test method is adopted from the procedures of the American Leather Chemists Association where it has long been in use and where it was approved for publication before the inclusion of precision and bias statements were mandated. The original inter-laboratory test data is no longer available. The user is cautioned to verify by the use of reference material if available that the precision and bias of this test method is adequate for the contemplated use.

9. Keywords

9.1 chrome fixation; Schorlemmer's system; sulfate basicity

[1] This test method is under the jurisdiction of ASTM Committee D-31 on Leather and is the direct responsibility of Subcommittee D31.06 on Chemical Analysis—General Methods.

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[2] *Annual Book of ASTM Standards*, Vol 15.04.