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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Specification for Glacial Acetic Acid[1]

This standard is issued under the fixed designation D 3620; 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 specification covers glacial (99.8 %) acetic acid for use in paint, varnish, lacquer, and related products.

1.2 For specific hazard information and guidance, see the supplier's Material Safety Data Sheet for materials listed in this specification.

2. Referenced Documents

2.1 *ASTM Standards:*

D 2191 Test Method for Acetaldehyde Content of Vinyl Acetate[2]

D 3546 Test Method for Formic Acid in Glacial Acetic Acid[2]

E 180 Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial Chemicals[3]

E 300 Practice for Sampling Industrial Chemicals[3]

E 302 Test Methods for Monobasic Organic Acids[3]

E 394 Test Method for Iron in Trace Quantities Using the 1,10-Phenanthroline Method[3]

2.2 *U.S. Federal Specification:*

PPP-C-2020 Chemicals, Liquid, Dry, and Paste: Packaging of[4]

3. Properties

3.1 Glacial acetic acid shall conform to the following requirements:

Acetic acid, weight %, min	99.8
Freezing point, °C, min	16.2
Color, Pt-Co scale, max	10
Water content, weight %, max	0.16
Iron, ppm (mg/kg), max	0.40
Acetaldehyde, weight %, max	0.05
Formic acid, weight %, max	0.09

4. Sampling

4.1 The material shall be sampled in accordance with Practice E 300.

5. Test Methods

5.1 The properties enumerated in this specification shall be determined in accordance with the following ASTM test methods:

5.1.1 *Purity*—Test Methods E 302 estimates the purity from the freezing point.

5.1.2 *Freezing Point*—Test Methods E 302.

5.1.3 *Color*—Test Methods E 302.

5.1.4 *Water*—Test Methods E 302.

5.1.5 *Iron*—Test Method E 394, using a 20-mL specimen diluted to 80 mL with water.

5.1.5.1 *Report*—Report the iron content to the nearest 0.01 ppm (mg/kg). Duplicates that agree within 0.07 ppm absolute are acceptable for averaging (95 % confidence level).

5.1.5.2 *Precision*[5]—The precision statements are based upon an interlaboratory study in which one operator in eight different laboratories analyzed two samples of acetic acid in duplicate on two different days. The results were treated in accordance with Practice E 180. The within-laboratory coefficient of variation was 3.05 % with 14 df and the between-laboratory coefficient of variation was 6.00 % with 6 df. Based upon these coefficients of variation, the following criteria should be used for judging the acceptability of results at the 95 % confidence level.

5.1.5.3 *Repeatability*—Two results, each the mean of duplicates, obtained by the same operator on different days should be considered suspect if they differ by more than 9.2 % relative.

5.1.5.4 *Reproducibility*—Two results, each the mean of duplicates, obtained by operators in different laboratories should be considered suspect if they differ by more than 20.6 % relative.

5.1.5.5 *Bias*—Bias cannot be determined for this specification because there is no available material having an accepted reference value.

5.1.6 *Acetaldehyde*—Test Method D 2191, using 100 mL of sodium bisulfite and a 25-mL specimen.

5.1.6.1 *Report*—Report the acetaldehyde content to the nearest 0.001 %. Duplicates that agree within 0.007 % absolute are acceptable for averaging (95 % confidence level).

5.1.6.2 *Precision*—The precision statements are based upon an interlaboratory study in which one operator in eight different

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[2] *Annual Book of ASTM Standards*, Vol 06.04.

[3] *Annual Book of ASTM Standards*, Vol 15.05.

[4] Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

[5] Supporting data are available from ASTM Headquarters. Request RR-D01-1010.

***A Summary of Changes section appears at the end of this standard.**

laboratories analyzed two samples of acetic acid in duplicate on 2 different days. The results were treated in accordance with Practice E 180. The within-laboratory standard deviation was f 0.0055 with 14 df, and the between-laboratory standard deviation was 0.0094 with 6 df. Based upon these standard deviations, the following criteria should be used for judging the acceptability of results at the 95 % confidence level.

5.1.6.3 *Repeatability*—Two results, each of the mean of duplicates, obtained by the same operator on different days should be considered suspect if they differ by more than 0.017 % absolute.

5.1.6.4 *Reproducibility*—Two results, each the mean of duplicates, obtained by operators in different laboratories should be considered suspect if they differ by more than 0.032 % absolute.

5.1.6.5 —Bias canot be determined for this specification because there is no available material having an accepted reference value.

5.1.7 *Formic Acid*—Test Method D 3546 uses formic acid as a calibration standard. The test method measures all reducing acids as formic acid.

6. Packaging and Package Marking

6.1 Package size shall be agreed upon between the purchaser and the supplier.

6.2 Packaging shall conform to applicable carrier rules and regulations or when specified shall conform to Fed. Spec. PPP-C-2020.

7. Keywords

7.1 glacial aectic acid

SUMMARY OF CHANGES

Committee D-1 has identified the location of selected changes to this standard since the last date of issue that may impact the use of this standard.

(*1*) Properties have been changed to show maximum **or** minimum values rather than showing maximum **and** minimum values.

(*2*) Bias statements have also been added.