



Designation: D4901 – 99 (Reapproved 2020)

## Standard Practice for Preparation of Solution of Liquid Vegetable Tannin Extracts<sup>1</sup>

This standard is issued under the fixed designation D4901; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This practice covers the preparation of a solution of liquid extract that is to be used in the tannin analysis of that extract.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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.*

### 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

[D4904 Practice for Cooling of Analytical Solutions](#)

[D6404 Practice for Sampling Vegetable Materials Containing Tannin](#)

2.2 *ALCA Methods:*

[A10 Preparation of Solution of Liquid Extracts](#)<sup>3</sup>

### 3. Summary of Practice

3.1 This practice describes a technique found useful in the preparation of analytical strength solutions from samples of liquid vegetable tannin extracts.

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee D31 on Leather and is the direct responsibility of Subcommittee D31.01 on Vegetable Leather. This practice has been adapted from, and is a replacement for, Method A10 of the Official Methods of the American Leather Chemists Association.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Official Methods of the American Leather Chemists Association. Available from the American Leather Chemists Association, University of Cincinnati, P.O. Box 210014, Cincinnati, OH 45221-0014.

### 4. Significance and Use

4.1 The concentration of tannin in extracts must be reduced to analytical strength (4 g tannin per L) for analysis.

4.2 Vegetable tannin extracts are heterogeneous mixtures of components with varying solubility.

4.3 The solubility of such extracts is influenced by temperature and concentration, which affect the degree of dispersion and size of the component particles.

4.4 While the solubility is better in hot water than in cold water, it is appropriate to dissolve and disperse an extract in hot water and then let the solution cool slowly to standard room temperature.

### 5. Apparatus and Reagents

5.1 *Formaldehyde*—40 % solution.

5.2 *Toluene*—assay  $\geq$  99.5 %.

5.3 *Flask*, 1 L volumetric. The Class A type, with upper bulb in neck, is especially suitable for this work.

### 6. Test Specimen

6.1 The specimen shall consist of an aliquot of the sample, prepared as described in Practice D6404, sufficient to give a solution containing as nearly as possible, 4 g of tannin per L (not less than 3.75 g, nor more than 4.25 g, per L).

### 7. Procedure

7.1 Prepare samples of liquid extracts as described in Practice D6404, and allow to come to room temperature. Thoroughly mix at room temperature and transfer specimen to a tared container and stoppered to prevent loss of moisture. Return no material which has been removed from the sample for any other purpose (for example, for determination of specific gravity, etc.) to the sample. Care must be taken that dried material around the neck of the stopper of the sample bottle does not contaminate the sample or specimen. Weigh the container and specimen to the nearest 0.1 mg.

NOTE 1—Shaking by hand is rarely sufficient; mechanical shaking, especially with a clinical-type shaker for 10 min, is preferred. In the case of very viscous extracts, a stirrer has to be used, in which case care must be taken to avoid the loss of moisture.

7.2 Pour approximately 200 mL of distilled water at 95°C into a 1 L volumetric flask and immediately transfer specimens,

quantitatively, into the flask with distilled water at 95°C. As soon as the specimen has been transferred, mix the contents of the flask by swirling. Add sufficient distilled water at 95°C to bring the volume to approximately 900 mL, and mix the solution again by swirling. The temperature of the solution immediately after this mixing shall not be less than 80°C. If necessary, apply heat to keep the solution above 80°C.

7.3 If the solution is likely to ferment (myrabolans or divi-divi), add 1 mL of 40 % formaldehyde and mix the solution again. In any event, the addition of from 3 to 4 drops

of toluene is recommended to ensure against mold growth during the overnight cooling.

7.4 Prepare duplicate solutions of 1 L each. It is permissible to prepare duplicate 2 L solutions, in which case double all appropriate volumes.

7.5 Cool the solution as directed in Practice **D4904**.

## 8. Keywords

8.1 analytical solution; tannin analysis; vegetable tannin analysis

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