



Designation: D 1166 – 84 (Reapproved 1995)^{ε1}

Standard Test Method for Methoxyl Groups in Wood and Related Materials¹

This standard is issued under the fixed designation D 1166; 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.

^{ε1} NOTE—Section 12 was added editorially in August 1995.

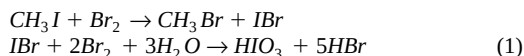
1. Scope

1.1 This test method covers the determination of methoxyl groups in wood and related materials (1 to 7).² The method is applicable to wood sawdust and, by suitable adjustment in size of the test specimen, to fractions isolated from wood and lignin.

1.2 *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.* Specific precautionary statements are given in Section 6.

2. Principle of Method

2.1 The principle of the test method is the same as that in the original method of Zeisel (1), except that the methyl iodide is collected in an acetic acid solution of potassium acetate containing bromine. The following reactions then occur:



The iodic acid is determined by titration of iodine liberated by the reaction:



From the above equations, it follows that one methoxyl group (CH_3O) liberates six atoms of iodine.

3. Significance and Use

3.1 Most of the methoxyl in wood is attributable to the lignin. This test method is used extensively in the study of lignin.

4. Apparatus

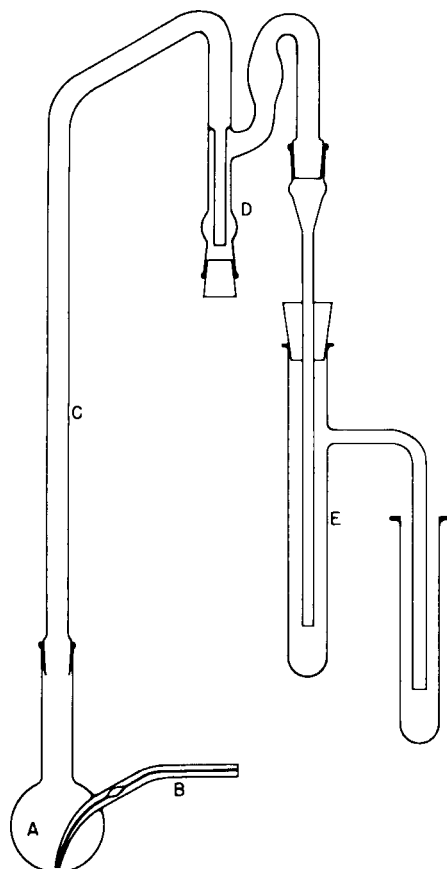
4.1 The apparatus shall be similar to that illustrated in Fig. 1 and shall consist of the following:

4.1.1 Reaction Flask,

¹ This test method is under the jurisdiction of ASTM Committee D-7 on Wood and is the direct responsibility of Subcommittee D07.01 on Fundamental Test Methods and Properties.

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² The boldface numbers in parentheses refer to the references listed at the end of this method.



A—Reaction flask.
B—CO₂ inlet tube.
C—Vertical air-cooled condenser.
D—Trap or scrubber.
E and F—Absorption vessels or receivers.

FIG. 1 Apparatus for Methoxyl Determination

4.1.2 *Heat Source*—A microburner, provided with a cylindrical shield to eliminate the effect of air drafts,

4.1.3 *Vertical Air-Cooled Condenser*,

4.1.4 *Scrubber*, and

4.1.5 *Two Absorption Vessels*.

5. Purity of Reagents and Water

5.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that