



Standard Test Method for Titer of Fatty Acids¹

This standard is issued under the fixed designation D 1982; 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 covers the determination of the solidification (titer) point of fatty acids and is applicable to all fatty acids.

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.*

2. Referenced Documents

2.1 *ASTM Standards:*

E 1 Specification for ASTM Thermometers²

2.2 *AOCS Standard:*

Specification H 6–40³

3. Significance and Use

3.1 Saturated fatty acids solidify at a higher temperature than unsaturated fatty acids. This test method provides a means of measuring the solidification temperature of a sample containing both unsaturated and saturated fatty acids by cooling the specimen and measuring the temperature at which solidification occurs.

3.2 Samples containing higher levels of saturated acids will have a higher titer (solidification temperature) than those with lower levels of saturated acids.

3.3 Water present in the sample will raise the titer, so provisions are made in the test method to remove traces of moisture.

4. Apparatus

4.1 *Beaker*, Griffin low-form, 2-L capacity.

4.2 *Bottle*, wide-mouth, 450-mL capacity, 190-mm height, inside diameter of neck 40 mm.

4.3 *Test Tubes*, 100 mm in length, 25 mm in diameter, with or without rim. These tubes may have an etched mark

extending around the tube at a distance of 57 mm from the bottom to show the height to which the tube is to be filled.

4.4 *Stirrer*, 2 to 3 mm in outside diameter, with one end bent in the form of a loop 20 mm in outside diameter. Glass or stainless steel wire may be used. The upper end can be formed to accommodate hand stirring or to be attached to a mechanical stirrer.

4.5 *Laboratory Thermometer*, having a range from 0 to 150°C.

4.6 *Titer Test Thermometer*—An ASTM Titer Test Thermometer having a range from – 2 to + 68°C and conforming to the requirements for Thermometer 36C as prescribed in Specification E 1.

NOTE 1—Thermometers conforming to the requirements for the AOCS Titer Thermometer (AOCS Specification H 6-40) meet these requirements.

5. Procedure

5.1 Heat the sample on a hot plate to 130°C to remove traces of moisture, and fill a test tube (see 4.3) to a height of 57 mm from the bottom.

5.1.1 Do not hold the sample at 130°C nor reheat to this temperature more than once. If excessive moisture is present, allow the water to settle, decant the fatty acids, and then refilter and reheat. The acids must be dry and free of suspended matter.

5.2 Fill the water bath to the designated level (Fig. 1) and adjust the temperature to 15 to 20°C below the expected titer point.

5.3 Place the test tube containing the fatty acids in the assembly as shown in Fig. 1. Insert the titer thermometer to the immersion mark so that it will be equidistant from the sides of the tube.

5.4 Stir with the stirring rod through a vertical distance of about 40 mm at the rate of 100 complete up-and-down motions per minute (Note 2). Start the agitation while the temperature is at least 10°C above the titer point.

NOTE 2—Stirring may be performed mechanically by attaching a small motor with suitable speed-reducing mechanism to the stirring rod.

5.5 Stir at the specified rate until the temperature remains constant for 30 s or begins to rise in less than a 30-s interval. Discontinue stirring immediately, remove the stirrer or raise it out of the specimen, and observe the increase in temperature. The titer point is the highest temperature indicated by the thermometer during this rise.

¹ This test method is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.34 on Naval Stores.

Current edition approved May 31, 1985. Published July 1985. Originally published as D 1982 – 61, replacing Sections 7–9 of D 1467 – 59 T. Last previous edition D 1982 – 61 (1984) ϵ^1 .

² *Annual Book of ASTM Standards*, Vol 14.03.

³ Available from American Oil Chemists' Society, 508 S. Sixth St., Champaign, IL 61820.