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Standard Method of Test for
CARBONYL CONTENT OF BUTADIENE¹



ASTM Designation: D 1089-59 (73XR78)

ADOPTED, 1953; REVISED, 1959.²

This Standard of the American Society for Testing Materials is issued under the fixed designation D 1089; the final number indicates the year of original adoption as standard or, in the case of revision, the year of last revision.

Scope

1. This method is intended for the determination of the carbonyl content in liquid C₄ hydrocarbons containing less than 2500 ppm. Acid or alkaline materials, if present, interfere and are determined by a blank titration.

Outline of Method

2. A measured quantity of liquid C₄ hydrocarbon is added to a cork stoppered narrow-mouthed bottle containing aqueous hydroxylamine hydrochloride reagent and Stoddard solvent. The carbonyl content is determined from the increase in the acidity of the resulting solution by titrating with a standard base, using a pH meter to determine the end point.

¹ Under the standardization procedure of the Society, this method is under the jurisdiction of the ASTM Committee D-2 on Petroleum Products and Lubricants.

The method was derived from the one developed and cooperatively tested by the Butadiene Producers' Committee on Specifications and Methods of Analysis of the Office of Rubber Reserve which appears in the Butadiene Laboratory Manual as method 2.1.5.1.

² Prior to its adoption as standard, this method was published as tentative from 1950 to 1953.

In 1959, a new Note 2 was added and the section on Precision was revised.

Apparatus

3. (a) *Bottles*, narrow-mouthed, 500-ml. fitted with cork stoppers.

(b) *Thermometer*.—For observing temperatures below -45 C, the Low Cloud and Pour Thermometer, having a range of -80 to 20 C or -112 to 70 F and conforming to the requirements for thermometer 6 C or 6 F as prescribed in the ASTM Specifications E 1³ is satisfactory.

(c) *Bomb Rack* for supporting the sample bomb in an upright position.

(d) *Copper Cooling Coil*.—Prepare a cooling coil by winding 4 in. of $\frac{1}{4}$ -in. seamless copper tubing on a short length of $\frac{3}{4}$ -in. pipe, allowing sufficient length of tubing at the end of the coil to connect it to the sample source. Attach a $\frac{1}{4}$ -in. valve on the outlet at a point that would not extend more than 3 in. above the surface of the bath liquid. To the valve attach a 3-in. piece of tubing bent for carrying the liquid into the required apparatus.

(e) *pH Meter*, having an accuracy of plus or minus 0.05 pH units.

(f) *Buret*, 10-ml. with 0.02-ml. divisions.

(g) *Buret*, 50-ml. with 0.1-ml. divisions.

³ Appears in this publication, see Contents in Numeric Sequence of ASTM Designations at front of book.