

AMERICAN SOCIETY FOR TESTING MATERIALS
1916 RACE ST., PHILADELPHIA 3, PA.

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AMERICAN STANDARD
BY THE AMERICAN STANDARDS ASSOCIATION
ASA NO.: Z11.67-1954
UDC 665.5:820.1 1955

Standard Method of Test for REAFFIRMED-1960

SAPONIFICATION NUMBER OF PETROLEUM PRODUCTS BY
POTENTIOMETRIC TITRATION¹



ASTM Designation: D 939 - 54

ADOPTED, 1950; REVISED, 1952, 1954.²

This Standard of the American Society for Testing Materials is issued under the fixed designation D 939; the final number indicates the year of original adoption as standard or, in the case of revision, the year of last revision.

Scope

1. (a) This method determines the acidic and basic constituents produced upon saponification of petroleum products under the conditions of the test, as well as those contained in them prior to saponification. The method resolves these constituents into groups having weak-acid, strong-acid, and base ionization properties, provided the dissociation constants of the more strongly acidic compounds are at least 10^3 times that of the next weaker group. It gives erroneous results with materials containing appreciable amounts of strong base. Unsaponifiable compounds whose acid or base dissociation constants in

water are smaller than 10^{-9} are not detectable and do not interfere; salts react as acids if their hydrolysis constants are greater than 10^{-9} .

(b) The method is applicable to materials that are soluble or nearly soluble in mixtures of benzene and isopropyl alcohol. It is intended particularly for the determination of the saponification number of new and used oils, electrical oils, and greases whether compounded or not. It is useful for the identification of unmixed animal or vegetable oils and for the determination of the amount of fatty material in compounded products, provided the sample does not contain appreciable amounts of certain nonfatty compounds, such as those of sulfur, phosphorus, the halogens, nitrogen, and metals other than potassium or sodium, which consume alkali or acid under the conditions of the test.

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.

² Prior to adoption as standard, this method was published as tentative from 1947 to 1950, being revised in 1950.

Published first as information in *Proceedings*, Am. Soc. Testing Mats., Vol. 43, p. 275 (1943).

In 1954, this method was extensively revised editorially. Sections 5(e), (f), (g), (h), (i), and (j) on buffer stock solutions were changed to conform with the solutions given in the ASTM Method D 664.

NOTE 1.—A color-indicator titration method is also available in ASTM Method D 94,³ Test for Saponification Number of Petroleum Products by Color-Indicator Titration. The two methods give comparable results when they are applied to new or slightly colored oils, or to

³ 1952 Book of ASTM Standards, Part 5.