



## Standard Practice for Isolation of Representative Saturates Fraction from High-Olefinic Petroleum Naphthas<sup>1</sup>

This standard is issued under the fixed designation D 2003; 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 practice covers the isolation of a representative saturates fraction from depentanized hydrocarbon mixtures that distill below 221°C (430°F). It is applicable for samples containing from 0 to 35 volume % olefinic hydrocarbons. However, for samples that contain less than 1 volume % of olefinic hydrocarbons the procedures given in Test Method D 2002, are recommended.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *This standard does not purport to address all of the safety problems, 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 Notes 1, 2, 3, 4, and 5.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

D 1319 Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption<sup>2</sup>

D 2002 Test Methods for Isolation of Representative Saturates Fraction from Low-Olefinic Petroleum Naphthas<sup>3</sup>

### 3. Terminology

#### 3.1 Description of a Term Specific to This Standard:

3.1.1 *saturates fraction*—the portion of the sample obtained from the silica gel fractionation procedure described in this practice, and essentially a mixture of paraffinic and naphthenic hydrocarbons.

### 4. Summary of Practice

4.1 A measured amount of sample is charged to the top of a glass column packed with fine activated silica gel. The adsorbed sample is then desorbed with alcohol, with the saturated hydrocarbons which have the lowest adsorption affinity issuing from the bottom of the silica gel column first. The total percolate collected prior to the elution of the yellow fluorescing olefinic marker is representative of the saturates in the sample.

### 5. Significance and Use

5.1 The determination of paraffins and naphthenes by the refractivity intercept requires a sample free from olefins and aromatics. This practice is applicable for the isolation of saturates fractions from samples containing up to 35 volume % olefins and 65 volume % total olefins plus aromatics.

### 6. Apparatus

6.1 *Adsorption Column*, as shown in Fig. 1.

6.2 *Receiver*, graduated, of capacity sufficient to collect the total saturates as one fraction. The inside diameter of the graduated portion should not exceed 10 mm.

6.3 *Vibrator*, for packing silica gel.

6.4 *Hypodermic Syringe*, for charging sample.

6.5 *Ultraviolet Light Source*, with radiation predominantly at 3650 Å.

6.6 *Refrigerant Circulation System*, to circulate liquid cooled to 4 to 16°C (40 to 60°F) through the adsorption column jacket.

### 7. Reagents

7.1 *Isopropyl Alcohol* (Warning—See Note 1).

NOTE 1: Warning—Flammable.

7.2 *Pressuring Gas* (Warning—See Note 2), delivered to the top of the column at a regulated pressure.

NOTE 2: Warning—Compressed gas.

7.3 *Silica Gel*, 149 to 74 µm (100 to 200-mesh).<sup>4</sup>

7.4 *Standard Dyed Gel*.<sup>5</sup>

### 8. Procedure

8.1 Clean the adsorption column with chromic-sulfuric acid (Warning—See Note 3), water, and acetone (Warning—See Note 4).

NOTE 3: Warning—Causes severe burns. A recognized carcinogen.

NOTE 4: Warning—Extremely flammable. Vapors may cause fire.

8.2 Introduce a small metallic or glass pellet, approximately 1.6 mm (1/16 in.) in diameter, to prevent the flow of silica gel from the bottom of the column, and sufficiently nonspherical to permit liquid elution.

8.3 Clamp the column in a vertical position and pack the

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<sup>2</sup> Annual Book of ASTM Standards, Vol 05.01.

<sup>3</sup> Annual Book of ASTM Standards, Vol 05.02.

<sup>4</sup> Silica gel, available from W. R. Grace and Co., Davison Chemical Division, Baltimore, MD 21203, by specifying Code 923, has been found satisfactory for this purpose.

<sup>5</sup> The standard dyed gel may be obtained from UOP Process Div., Organics Dept., 25 E. Algonquin Rd., Des Plaines, IL 60017-5017, by requesting "FIA Standard Dyed Gel", UOP Product No. 675.