Designation: D4642 – 04(Reapproved 2010)

Standard Test Method for Platinum in Reforming Catalysts by Wet Chemistry[1]

This standard is issued under the fixed designation D4642; 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 platinum in nonzeolitic, fresh reforming catalysts containing platinum as the only precious metal, in the range of concentration of 0.200 to 0.700 weight %.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *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:*[2]

D1193 Specification for Reagent Water

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E288 Specification for Laboratory Glass Volumetric Flasks

E456 Terminology Relating to Quality and Statistics

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

2.2 *U.S. Federal Specification:*

NNN-P-395C Tolerance for Class A Pipets[3]

3. Summary of Test Method

3.1 The ground alumina based reforming catalyst is dissolved using dilute hydrochloric acid. Stannous chloride is added to convert the platinum in solution to a yellowish-orange-colored platinum stannous hydrochloride complex. The absorbance of the resulting solution is measured comparatively at 403 nm by spectrophotometry and the platinum content is calculated from a previously determined value for the absorptivity.

4. Significance and Use

4.1 This test method provides a means of determining the platinum content of fresh reforming catalysts where the platinum is supported on an all alumina substrate.[4]

4.2 This test method is not intended to cover samples containing metals other than platinum. Palladium, rhenium, and rhodium in particular interfere with the spectrophotometric determination of platinum.

5. Apparatus

5.1 *Balance,* analytical, capable of weighing to the nearest 0.1 mg.

5.2 *Beakers,* 250-mL, tall form and 600-mL.

5.3 *Cells,* spectrophotometer, 1.0 cm, matched.

5.4 *Crucibles,* platinum, or porcelain, 50-mL.

5.5 *Desiccator,* vacuum.

5.6 *Filter Paper,* fine, ashless, slow filtering, 12.5 cm or equivalent.

5.7 *Flasks,* volumetric, conforming to tolerances specified by Specification E288, 500-mL and 1000-mL.

5.8 *Funnel,* filtering, fluted bowl, 65 mm top diameter, 150 mm stem.

5.9 *Graduated Cylinders,* 10-mL, 25-mL, 50-mL, 250-mL.

5.10 *Pipets,* conforming to tolerances specified by Federal Specification NNN-P-395C, 5-mL, 10-mL, 15-mL.

5.11 *Muffle Furnace,* capable of 1000 ± 25°C.

5.12 *Spectrophotometer,* capable of measuring absorbance values between 200 to 800 nm with a photometric repeatability of ±0.002 absolute at 1.0 absolute.

5.13 *Watch Glass,* flat, 100 mm.

5.14 *Watch Glass,* ribbed, 65 mm.

[1] This test method is under the jurisdiction of ASTM Committee D32 on Catalysts and is the direct responsibility of Subcommittee D32.03 on Chemical Composition.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098.

[4] This test method can be extended to spent reforming catalyst by isolating the platinum by the methods described in "Assay Procedure for Platinum in Reforming Catalysts," *Analytical Chemistry* , Vol 32, No. 6, May 1960, p. 646.