Designation: ~~D1686 – 10~~ D1686 – 19

Standard Test Method for Color of Solid Aromatic Hydrocarbons and Related Materials in the Molten State (Platinum-Cobalt Scale)[1]

This standard is issued under the fixed designation D1686; 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 visual measurement of the color of thermally stable solids melting below 150°C. It is applicable only to materials in which the color-producing bodies present have light absorption characteristics quite similar to those of the standards used. The scope of this method covers the range of calibration which is 0 to 100 Pt-Co color.

1.2 In determining the conformance of the test results using this method to applicable specifications, results shall be rounded off in accordance with the rounding-off method of Practice E29.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard. Weight% should be used rather than Mass%.

1.4 *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~~ safety, health, and ~~health~~environmental practices and determine the applicability of regulatory limitations prior to use.* For specific hazard statements see Sections 7 and 9.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1193 Specification for Reagent Water
D3438 Practice for Sampling and Handling Naphthalene, Maleic Anhydride, and Phthalic Anhydride
D3852 Practice for Sampling and Handling Phenol, Cresols, and Cresylic Acid
D6809 Guide for Quality Control and Quality Assurance Procedures for Aromatic Hydrocarbons and Related Materials
D8005 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)
E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

2.2 *Other Document:*

OSHA Regulations, 29 CFR paragraphs 1910.1000 and 1910.1200[3]

3. Significance and Use

3.1 Color by this test method is a measure of color-producing impurities present in the thermally stable solids. This test method is suitable for setting specifications and for use as an internal quality control tool.

4. Apparatus

4.1 *Color Comparison Tubes*—Matched 100-mL, tall-form Nessler tubes, provided with ground-on, optically clear, glass caps. Tubes should be selected so that the height of the 100-mL graduation mark is 300 ± 3 mm above the bottom of the tube. The use of heat-resistant tubes is preferred for safety reasons.

---

[1] This test method is under the jurisdiction of ASTM Committee D16 on ~~Aromatic Hydrocarbons~~ Aromatic, Industrial, Specialty and Related Chemicals and is the direct responsibility of Subcommittee D16.02 on Oxygenated Aromatics.

Current edition approved ~~Jan. 1, 2010~~Jan. 15, 2019. Published ~~January 2010~~February 2019. Originally approved in 1959. Last previous edition approved in ~~2004~~2010 as ~~D1686 – 96 (2004).~~D1686 – 10. DOI: ~~10.1520/D1686-10.~~10.1520/D1686-19.

[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~~standard's Document Summary page on the ASTM website.

[3] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, http://www.access.gpo.gov.

***A Summary of Changes section appears at the end of this standard**

4.2 *Color Comparator*—A color comparator constructed to permit visual comparison of light transmitted through tall-form, 100-mL Nessler tubes in the direction of their longitudinal axes. The comparator should be constructed so that white light is reflected off a white plate and directed with equal intensity through the tubes, and should be shielded so that no light enters the tubes from the side.

4.3 *Oven*—An oven, preferably of the forced draft type and capable of maintaining a constant temperature ±1°C in the range up to 150°C. Alternatively, the use of an aluminum heating block provided with proper temperature control or other similar equipment is permissible.

TABLE 1 Platinum-Cobalt Color Standards[A]

Color Standard No.	Stock Solution, mL	Color Standard No.	Stock Solution, mL
~~5~~	~~1~~	~~35~~	~~7~~
~~10~~	~~2~~	~~40~~	~~8~~
~~15~~	~~3~~	~~50~~	~~10~~
~~20~~	~~4~~	~~60~~	~~12~~
~~25~~	~~5~~	~~70~~	~~14~~
~~30~~	~~6~~	~~100~~	~~20~~

TABLE 1 Platinum-Cobalt Color Standards[A]

Color Standard No.	Stock Solution, mL	Color Standard No.	Stock Solution, mL
1	0.20	19	3.80
2	0.40	20	4.00
3	0.60	25	5.00
4	0.80	30	6.00
5	1.00	35	7.00
6	1.20	40	8.00
7	1.40	45	9.00
8	1.60	50	10.00
9	1.80	55	11.00
10	2.00	60	12.00
11	2.20	65	13.00
12	2.40	70	14.00
13	2.60	75	15.00
14	2.80	80	16.00
15	3.00	85	17.00
16	3.20	90	18.00
17	3.40	95	19.00
18	3.60	100	20.00

[A] Other color standards may be prepared by proportional dilution.

5. Reagents

5.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.[4] Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

5.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean Type IV reagent water conforming to Specification D1193.

5.3 *Cobalt Chloride* ($CoCl_2 \cdot 6H_2O$).

5.4 *Hydrochloric Acid* (sp gr 1.19)—Concentrated hydrochloric acid (HCl).

5.5 *Potassium Chloroplatinate* (K_2PtCl_6).

6. Standards

6.1 *Platinum-Cobalt Stock Solution*—Dissolve 1.245 g of K_2PtCl_6 and 1.000 g of $CoCl_2 \cdot 6H_2O$ in water. Add 100 mL of HCl and dilute to 1 L with water. This solution has a color of 500.[5]

[4] *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopeia and National Formulary*, U.S. Pharmacopeial Convention, Inc. (USPC), Rockville, MD.

[5] The stock solution with color No. 500 may be purchased as such from chemical supply firms. Use of the purchased standard is satisfactory.