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.

Designation: D7343 – 18

Designation: 558/07

Standard Practice for Optimization, Sample Handling, Calibration, and Validation of X-ray Fluorescence Spectrometry Methods for Elemental Analysis of Petroleum Products and Lubricants[1]

This standard is issued under the fixed designation D7343; 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 information relating to sampling, calibration and validation of X-ray fluorescence instruments for elemental analysis, including all kinds of wavelength dispersive (WDXRF) and energy dispersive (EDXRF) techniques. This practice includes sampling issues such as the selection of storage vessels, transportation, and sub-sampling. Treatment, assembly, and handling of technique-specific sample holders and cups are also included. Technique-specific requirements during analytical measurement and validation of measurement for the determination of trace elements in samples of petroleum and petroleum products are described. For sample mixing, refer to Practice D5854. Petroleum products covered in this practice are considered to be a single phase and exhibit Newtonian characteristics at the point of sampling.

1.2 *Applicable Test Methods*—This practice is applicable to the XRF methods under the jurisdiction of ASTM Subcommittee D02.03 on Elemental Analysis, and those under the jurisdiction of the Energy Institute's Test Method Standardization Committee (Table 1). Some of these methods are technically equivalent though they may differ in details (Table 2).

1.3 *Applicable Fluids*—This practice is applicable to petroleum and petroleum products with vapor pressures at sampling and storage temperatures less than or equal to 101 kPa (14.7 psi). Use Practice D4057 or IP 475 to sample these materials. Refer to Practice D5842 when sampling materials that also require Reid vapor pressure (RVP) determination.

1.4 *Non-applicable Fluids*—Petroleum products whose vapor pressure at sampling and sample storage conditions are above 101 kPa (14.7 psi) and liquefied gases (that is, LNG, LPG, etc.) are not covered by this practice.

1.5 *Sampling Methods*—The physical sampling and methods of sampling from a primary source are not covered by this guide. It is assumed that samples covered by this practice are a representative sample of the primary source liquid. Refer to Practice D4057 or IP 475 for detailed sampling procedures.

1.6 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

1.7 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

[1] This practice is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.03 on Elemental Analysis.

Current edition approved June 1, 2018. Published June 2018. Originally approved in 2007. Last previous edition approved in 2017 as D7343 – 12 (2017). DOI: 10.1520/D7343-18.

This practice was jointly prepared by ASTM International and the Energy Institute.

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

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