



Designation: D8088 – 16 (Reapproved 2022)

Standard Practice for Determination of the Six Major Rare Earth Elements in Fluid Catalytic Cracking Catalysts, Zeolites, Additives, and Related Materials by Inductively Coupled Plasma Optical Emission Spectroscopy¹

This standard is issued under the fixed designation D8088; 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 describes the analysis of fluid catalytic cracking catalysts, rare earth exchanged zeolitic materials, additive and related materials when analyzed by ICP-OES for the six most common rare earth elements.

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

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use. See [Appendix X3](#).*

1.4 *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

- [C1109 Practice for Analysis of Aqueous Leachates from Nuclear Waste Materials Using Inductively Coupled Plasma-Atomic Emission Spectroscopy](#)
- [D1193 Specification for Reagent Water](#)
- [D3766 Terminology Relating to Catalysts and Catalysis](#)
- [D6299 Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical](#)

Measurement System Performance

- [D6349 Test Method for Determination of Major and Minor Elements in Coal, Coke, and Solid Residues from Combustion of Coal and Coke by Inductively Coupled Plasma—Atomic Emission Spectrometry](#)
 - [D7085 Guide for Determination of Chemical Elements in Fluid Catalytic Cracking Catalysts by X-ray Fluorescence Spectrometry \(XRF\)](#)
 - [D7260 Practice for Optimization, Calibration, and Validation of Inductively Coupled Plasma-Atomic Emission Spectrometry \(ICP-AES\) for Elemental Analysis of Petroleum Products and Lubricants](#)
 - [D7442 Practice for Sample Preparation of Fluid Catalytic Cracking Catalysts and Zeolites for Elemental Analysis by Inductively Coupled Plasma Optical Emission Spectroscopy](#)
 - [E1479 Practice for Describing and Specifying Inductively Coupled Plasma Atomic Emission Spectrometers](#)
- 2.2 *EPA Standard:*³
- [Method 6010B Inductively Coupled Plasma-Atomic Emission Spectrometry](#)

3. Terminology

- 3.1 *Definitions*—See Terminology [D3766](#).
- 3.2 *Definitions of Terms Specific to This Standard:*
 - 3.2.1 *ICP-OES*—Inductively Coupled Plasma Optical Emission Spectroscopy
 - 3.2.2 *FCC*—Fluid Catalytic Cracking
 - 3.2.3 *Water*—Defined as ASTM Type I or highest quality available as defined in Specification [D1193](#).

4. Summary of Practice

4.1 Specimens are prepared using one of the three preparation techniques described in Practice [D7442-08a](#). The result should be a clear, dilute acidic solution suitable for ICP-OES.

¹ This practice is under the jurisdiction of ASTM Committee [D32](#) on Catalysts and is the direct responsibility of Subcommittee [D32.03](#) on Chemical Composition. Current edition approved April 1, 2022. Published May 2022. Originally approved in 2016. Last previous edition approved in 2016 as D8088 – 16. DOI: 10.1520/D8088-16R22.

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 United States Environmental Protection Agency (EPA), William Jefferson Clinton Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20460, <http://www.epa.gov>.