

# ASTM Volume 03.05, October 2017

## Analytical Chemistry for Metals, Ores, and Related Materials

### Table of Contents

E32-15 Standard Practices for Sampling  
Ferroalloys and Steel Additives for Determination  
of Chemical Composition

E34-11e1 Standard Test Methods for Chemical  
Analysis of Aluminum and Aluminum-Base Alloys

E37-05(2011) Standard Test Methods for  
Chemical Analysis of Pig Lead

E53-07(2013) Standard Test Method for  
Determination of Copper in Unalloyed Copper by  
Gravimetry

E55-11 Standard Practice for Sampling Wrought  
Nonferrous Metals and Alloys for Determination  
of Chemical Composition

E88-11 Standard Practice for Sampling  
Nonferrous Metals and Alloys in Cast Form for  
Determination of Chemical Composition

E247-01(2015)e1 Standard Test Method for  
Determination of Silica in Manganese Ores, Iron  
Ores, and Related Materials by Gravimetry

E248-12 Standard Test Method for Determination  
of Manganese in Manganese Ores by  
Pyrophosphate Complexed Permanganate  
Potentiometric Titrimetry

E255-07(2014) Standard Practice for Sampling  
Copper and Copper Alloys for the Determination  
of Chemical Composition

E278-01(2015)e1 Standard Test Method for  
Determination of Phosphorus in Iron Ores by  
Phosphomolybdate Coprecipitation and Nitric

## Acid Titrimetry

E279-97(2010) Standard Test Method for Determination of Abrasion Resistance of Iron Ore Pellets and Sinter by the Tumbler Test

E305-13 Standard Practice for Establishing and Controlling Atomic Emission Spectrochemical Analytical Curves

E314-16 Standard Test Methods for Determination of Manganese in Iron Ores by Pyrophosphate Potentiometry and Periodate Spectrophotometry Techniques

E316-11 Standard Test Method for Determination of Iron in Manganese Ores by Hydrogen Sulfide Reduction-Dichromate Titrimetry

E322-12 Standard Test Method for Analysis of Low-Alloy Steels and Cast Irons by Wavelength Dispersive X-Ray Fluorescence Spectrometry

E342-11(2016) Standard Test Method for Determination of Chromium Oxide in Chrome Ores by Permanganate Titrimetry

E350-12 Standard Test Methods for Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron

E351-13 Standard Test Methods for Chemical Analysis of Cast Iron—All Types

E352-13 Standard Test Methods for Chemical Analysis of Tool Steels and Other Similar Medium- and High-Alloy Steels

E353-14 Standard Test Methods for Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

E354-14 Standard Test Methods for Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and

## Cobalt Alloys

E363-16 Standard Test Methods for Chemical Analysis of Chromium and Ferrochromium

E367-16 Standard Test Methods for Chemical Analysis of Ferroniobium

E372-13 Standard Test Method for Determination of Calcium and Magnesium in Magnesium Ferrosilicon by EDTA Titration

E382-12 Standard Test Method for Determination of Crushing Strength of Iron Ore Pellets

E396-12e1 Standard Test Methods for Chemical Analysis of Cadmium

E406-81(2012) Standard Practice for Using Controlled Atmospheres in Spectrochemical Analysis

E415-17 Standard Test Method for Analysis of Carbon and Low-Alloy Steel by Spark Atomic Emission Spectrometry

E439-17 Standard Test Methods for Chemical Analysis of Beryllium

E463-14a Standard Test Method for Determination of Silica in Fluorspar by Silico-Molybdate Visible Spectrophotometry

E465-11(2017) Standard Test Methods for Determination of Manganese (IV) in Manganese Ores by Redox Titrimetry

E478-08(2017) Standard Test Methods for Chemical Analysis of Copper Alloys

E507-13 Standard Test Method for Determination of Aluminum in Iron Ores by Flame Atomic Absorption Spectrometry

E508-13 Standard Test Method for Determination of Calcium and Magnesium in Iron Ores by

## Flame Atomic Absorption Spectrometry

E520-08(2015)e1 Standard Practice for Describing Photomultiplier Detectors in Emission and Absorption Spectrometry

E536-16 Standard Test Methods for Chemical Analysis of Zinc and Zinc Alloys

E539-11 Standard Test Method for Analysis of Titanium Alloys by X-Ray Fluorescence Spectrometry

E572-13 Standard Test Method for Analysis of Stainless and Alloy Steels by Wavelength Dispersive X-Ray Fluorescence Spectrometry

E581-17 Standard Test Methods for Chemical Analysis of Manganese-Copper Alloys

E634-12 Standard Practice for Sampling of Zinc and Zinc Alloys by Spark Atomic Emission Spectrometry

E716-16 Standard Practices for Sampling and Sample Preparation of Aluminum and Aluminum Alloys for Determination of Chemical Composition by Spark Atomic Emission Spectrometry

E815-17 Standard Test Method for Determination of Calcium Fluoride in Fluorspar by Complexometric Titrimetry

E826-14 Standard Practice for Testing Homogeneity of a Metal Lot or Batch in Solid Form by Spark Atomic Emission Spectrometry

E882-10(2016) Standard Guide for Accountability and Quality Control in the Chemical Analysis Laboratory

E945-12 Standard Test Method for Determination of Zinc in Zinc Ores and Concentrates by EDTA Complexometric Titrimetry

E1010-16 Standard Practice for Preparation of Disk Specimens of Steel and Iron by Remelting for Spectrochemical Analysis

E1019-11 Standard Test Methods for Determination of Carbon, Sulfur, Nitrogen, and Oxygen in Steel, Iron, Nickel, and Cobalt Alloys by Various Combustion and Fusion Techniques

E1070-17 Standard Test Method for Determination of Phosphorus in Iron Ores by Phospho-Molybdenum-Blue Spectrophotometry

E1085-16 Standard Test Method for Analysis of Low-Alloy Steels by Wavelength Dispersive X-Ray Fluorescence Spectrometry

E1086-14 Standard Test Method for Analysis of Austenitic Stainless Steel by Spark Atomic Emission Spectrometry

E1097-12(2017) Standard Guide for Determination of Various Elements by Direct Current Plasma Atomic Emission Spectrometry

E1172-16 Standard Practice for Describing and Specifying a Wavelength Dispersive X-Ray Spectrometer

E1184-10(2016) Standard Practice for Determination of Elements by Graphite Furnace Atomic Absorption Spectrometry

E1251-11 Standard Test Method for Analysis of Aluminum and Aluminum Alloys by Spark Atomic Emission Spectrometry

E1257-16 Standard Guide for Evaluating Grinding Materials Used for Surface Preparation in Spectrochemical Analysis

E1277-14 Standard Test Method for Analysis of Zinc-5% Aluminum-Mischmetal Alloys by ICP Emission Spectrometry

E1306-17 Standard Practice for Preparation of Metal and Alloy Samples for Chemical Analysis by Electric Arc Remelting

E1329-10 Standard Practice for Verification and Use of Control Charts in Spectrochemical Analysis

E1335-08(2017) Standard Test Methods for Determination of Gold in Bullion by Fire Assay Cupellation Analysis

E1361-02(2014)e1 Standard Guide for Correction of Interelement Effects in X-Ray Spectrometric Analysis

E1409-13 Standard Test Method for Determination of Oxygen and Nitrogen in Titanium and Titanium Alloys by Inert Gas Fusion

E1446-13 Standard Test Method for Chemical Analysis of Refined Gold by Direct Current Plasma Atomic Emission Spectrometry

E1447-09(2016) Standard Test Method for Determination of Hydrogen in Titanium and Titanium Alloys by Inert Gas Fusion Thermal Conductivity/Infrared Detection Method

E1473-16 Standard Test Methods for Chemical Analysis of Nickel, Cobalt and High-Temperature Alloys

E1479-16 Standard Practice for Describing and Specifying Inductively Coupled Plasma Atomic Emission Spectrometers

E1552-15 Standard Test Method for Determining Hafnium in Zirconium and Zirconium Alloys By Direct Current Plasma—Atomic Emission Spectrometry

E1568-13 Standard Test Method for Determination of Gold in Activated Carbon by Fire Assay Gravimetry

E1569-09 Standard Test Method for  
Determination of Oxygen in Tantalum Powder by  
Inert Gas Fusion Technique

E1587-17 Standard Test Methods for Chemical  
Analysis of Refined Nickel

E1600-15 Standard Test Methods for  
Determination of Gold in Cyanide Solutions

E1601-12 Standard Practice for Conducting an  
Interlaboratory Study to Evaluate the  
Performance of an Analytical Method

E1621-13 Standard Guide for Elemental Analysis  
by Wavelength Dispersive X-Ray Fluorescence  
Spectrometry

E1659-12 Standard Test Methods for Coating  
Mass and Chemical Analysis of Zinc-Nickel Alloy  
Electrolytically Coated on Steel Sheet

E1770-14 Standard Practice for Optimization of  
Electrothermal Atomic Absorption Spectrometric  
Equipment

E1805-13 Standard Test Method for  
Determination of Gold in Copper Concentrates by  
Fire Assay Gravimetry

E1806-09(2016) Standard Practice for Sampling  
Steel and Iron for Determination of Chemical  
Composition

E1832-08(2017) Standard Practice for Describing  
and Specifying a Direct Current Plasma Atomic  
Emission Spectrometer

E1833-07a(2013)e1 Standard Practice for  
Sampling of Blister Copper in Cast Form for  
Determination of Chemical Composition

E1834-11 Standard Test Method for Analysis of  
Nickel Alloys by Graphite Furnace Atomic  
Absorption Spectrometry

E1835-14 Standard Test Method for Analysis of Nickel Alloys by Flame Atomic Absorption Spectrometry

E1852-13 Standard Test Method for Determination of Low Levels of Antimony in Carbon and Low-Alloy Steel by Graphite Furnace Atomic Absorption Spectrometry

E1898-13 Standard Test Method for Determination of Silver in Copper Concentrates by Flame Atomic Absorption Spectrometry

E1916-11 Standard Guide for Identification of Mixed Lots of Metals

E1917-13 Standard Test Method for Determination of Phosphorus in Nickel, Ferronickel, and Nickel Alloys by Phosphovanadomolybdate Spectrophotometry

E1938-13 Standard Test Method for Determination of Titanium in Nickel Alloys by Diantiprylmethane Spectrophotometry

E1941-10(2016) Standard Test Method for Determination of Carbon in Refractory and Reactive Metals and Their Alloys by Combustion Analysis

E1950-10 Standard Practice for Reporting Results from Methods of Chemical Analysis

E1999-11 Standard Test Method for Analysis of Cast Iron by Spark Atomic Emission Spectrometry

E2050-17 Standard Test Method for Determination of Total Carbon in Mold Powders by Combustion

E2093-12(2016) Standard Guide for Optimizing, Controlling and Assessing Test Method Uncertainties from Multiple Workstations in the Same Laboratory Organization

E2209-13 Standard Test Method for Analysis of High Manganese Steel by Spark Atomic Emission Spectrometry

E2242-13 Standard Test Method for Column Percolation Extraction of Mine Rock by the Meteoric Water Mobility Procedure

E2293-03(2013) Standard Practice for Drying of Metal Bearing Ores, Concentrates, and Related Metallurgical Materials for the Determination of Mercury

E2295-13 Standard Practice for Fire Assay Silver Corrections in Analysis of Metal Bearing Ores, Concentrates, and Related Metallurgical Materials by Silver Determination in Slags and Cupels

E2296-03(2013) Standard Practice for Silver Corrections in Metal Bearing Ores, Concentrates, and Related Metallurgical Materials by Fire Assay Slag Recycling and Cupel Proof Gravimetry

E2371-13 Standard Test Method for Analysis of Titanium and Titanium Alloys by Direct Current Plasma and Inductively Coupled Plasma Atomic Emission Spectrometry (Performance-Based Test Methodology)

E2465-13 Standard Test Method for Analysis of Ni-Base Alloys by Wavelength Dispersive X-Ray Fluorescence Spectrometry

E2594-09(2014) Standard Test Method for Analysis of Nickel Alloys by Inductively Coupled Plasma Atomic Emission Spectrometry (Performance-Based Method)

E2792-13 Standard Test Method for Determination of Hydrogen in Aluminum and Aluminum Alloys by Inert Gas Fusion

E2823-17 Standard Test Method for Analysis of

Nickel Alloys by Inductively Coupled Plasma  
Mass Spectrometry (Performance-Based)

E2824-11 Standard Test Method for  
Determination of Beryllium in Copper-Beryllium  
Alloys by Phosphate Gravimetric Method

E2857-11(2016) Standard Guide for Validating  
Analytical Methods

E2941-14 Standard Practices for Extraction of  
Elements from Ores and Related Metallurgical  
Materials by Acid Digestion

E2994-16 Standard Test Method for Analysis of  
Titanium and Titanium Alloys by Spark Atomic  
Emission Spectrometry and Glow Discharge  
Atomic Emission Spectrometry (Performance-  
Based Method)

E3047-16 Standard Test Method for Analysis of  
Nickel Alloys by Spark Atomic Emission  
Spectrometry

E3061-17 Standard Test Method for Analysis of  
Aluminum and Aluminum Alloys by Inductively  
Coupled Plasma Atomic Emission Spectrometry  
(Performance Based Method)