Busta prova orale numero 1

La/Il Candidata/o discuta i seguenti quesiti:

Primo quesito

Gestione dei gas tecnici con particolare riguardo per il gas Elio necessario per il funzionamento di analizzatore elementare.

Secondo quesito

Accuratezza ed errori di misura.

Terzo quesito

I dispositivi di protezione individuale (DPI) utilizzati nel laboratorio chimico analitico di servizi.

INTERNATIONAL STANDARD ISO 16948:2015(E)

Solid biofuels — Determination of total content of carbon, hydrogen and nitrogen

1 Scope

This International Standard describes a method for the determination of total carbon, hydrogen and nitrogen contents in solid biofuels.

3 Terms and definitions

For the purposes of this document the terms and definitions given in ISO 16559 and the following apply.

3.1
reference material
RM
material or substance one or more of whose property values are sufficiently homogeneous and well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning values to materials

4 Principle

A known mass of sample is burnt in oxygen, or in an oxygen/carrier gas mixture, under conditions such that it is converted into ash and gaseous products of combustion. These consist mainly of carbon dioxide, water vapour, elemental nitrogen and/or oxides of nitrogen, oxides and oxyacids of sulfur and hydrogen halides. The products of combustion are treated to ensure that any hydrogen associated with sulfur or halides products of combustion are liberated as water vapour. Oxides of nitrogen are reduced to nitrogen, and those products of combustion which would interfere with the subsequent gas-analysis procedures are removed. The carbon dioxide, water vapour and nitrogen mass fractions of the gas stream are then determined quantitatively by appropriate instrumental gas analysis procedures.

Busta prova orale numero 2

La/Il Candidata/o discuta i seguenti quesiti:

Primo quesito

Il laboratorio chimico analitico di servizio e il software LIMS: descrivere struttura e funzioni.

Secondo quesito

Descrizione e schema a blocchi di uno spettrometro ICP-OES e differenza tra vista assiale e radiale del plasma.

Terzo quesito

La gestione dei rifiuti chimici prodotti nel laboratorio chimico analitico di servizi.

INTERNATIONAL STANDARD ISO 15093:2015(E)

Jewellery — Determination of precious metals in 999 $^{0}/_{00}$ gold, platinum and palladium jewellery alloys — Difference method using ICP-OES

1 Scope

This International Standard specifies an analytical procedure for the determination of either platinum in platinum jewellery alloys, gold in gold jewellery alloys, or palladium in palladium jewellery alloys, with a nominal content of each precious metal of 999 ‰ (parts per thousand) by measuring specific elements. (See Tables A.1, A.2, and A.3.)

This International Standard specifies a method intended to be used as the recommended method for the determination of fineness in 999 ‰ alloys covered by ISO 9202.

3 Principle

The samples of the precious metal alloy are weighed and dissolved in aqua regia to prepare a 10 g/l solution. The impurities are determined by ICP-OES, and the precious metals content is obtained by subtraction of the total content of impurities in the sample from 1 000 ‰.

4 Sampling

The sampling procedure shall be performed in accordance with ISO 11596.

Busta prova orale numero 3

La/Il Candidata/o discuta i seguenti quesiti:

Primo quesito

Gestione dei gas tecnici con particolare riguardo per il gas Argon necessario per il funzionamento di spettrometro ICP-OES.

Secondo quesito

Descrizione e schema a blocchi di un cromatografo HPLC e rivelatore a indice di rifrazione.

Terzo quesito

Modalità di acquisto sul MEPA.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16963

January 2018

ICS 65.080

English Version

Fertilizers — Determination of boron, cobalt, copper, iron, manganese, molybdenum and zinc using ICP-AES

1 Scope

This European Standard specifies a method for the determination of boron, cobalt, copper, iron, manganese, molybdenum and zinc in fertilizer extracts using inductively coupled plasma-atomic emission spectrometry (ICP-AES).

This method is applicable to water and aqua regia fertilizer extracts prepared according to EN 16962 and/or EN 16964.

4 Principle

The method is based on the ICP-AES measurement of the concentration of boron, cobalt, copper, iron, manganese, molybdenum and zinc in fertilizer extracts prepared according to EN 16962 or EN 16964. The elements are determined after appropriate dilution of the extract. The solution is dispersed by a nebulizer of the ICP-AES instrument and the resulting aerosol is transported into the plasma. Element specific emission spectra are produced by a radio-frequency inductively coupled argon plasma where atoms or ions are excited at high temperature. The emission spectra are dispersed by a spectrometer, and the intensities of the emission lines are monitored by photosensitive devices. Multi-element determinations using sequential or simultaneous optical systems and axial or radial viewing of the plasma may be used.

Busta prova orale numero 4

La/Il Candidata/o discuta i seguenti quesiti:

Primo quesito

L'acqua nel laboratorio chimico analitico: caratteristiche e impianti di produzione.

Secondo quesito

Descrizione e schema a blocchi di un cromatografo GC e rivelatore FID.

Terzo quesito

Come funziona il MEPA per la PA e quali sono i vantaggi.

Soil quality —

Part 3: Chemical methods —

Section 3.8 Determination of organic and total carbon after dry combustion (elementary analysis)

1 Scope

This International Standard specifies a method for the determination of the total carbon content in soil after dry combustion. The organic carbon content is calculated from this content after correcting for carbonates present in the sample. If carbonates are removed beforehand, the organic carbon content is measured directly.

This International Standard is applicable to all types of air-dried soil samples.

3 Principle

The carbon present in the soil is oxidized to carbon dioxide (CO_2) by heating the soil to at least 900 °C in a flow of oxygen-containing gas that is free from carbon dioxide. The amount of carbon dioxide released is then measured by titrimetry, gravimetry, conductometry, gas chromatography or using an infrared detection method, depending on the apparatus used. When the soil is heated to a temperature of at least 900 °C, any carbonates present are completely decomposed. For the determination of the organic carbon content, any carbonates present are previously removed by treating the soil with hydrochloric acid.

Busta prova orale numero 5

La/Il Candidata/o discuta i seguenti quesiti:

Primo quesito

Manutenzione ordinaria e straordinaria della strumentazione scientifica presente in un laboratorio di analisi chimiche come GC, HPLC, ICP-OES.

Secondo quesito

Procedure di validazione di un metodo analitico chimico.

Terzo quesito

Sicurezza nella manipolazione e utilizzo dei gas tecnici in bombole normalmente presenti nel laboratorio chimico analitico di servizi.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 14107

April 2003

ICS 67.200.10

English version

Fat and oil derivatives - Fatty Acid Methyl Esters (FAME) - Determination of phosphorus content by inductively coupled plasma (ICP) emission spectrometry

1 Scope

This European Standard specifies an inductively coupled plasma (ICP) emission spectrometry method for the determination of phosphorus content between 4 mg/kg and 20 mg/kg in Fatty Acid Methyl Esters, hereinafter referred as FAME.

4 Principle

A weighed test portion of sample is diluted in xylene. The standards are prepared from a phosphorus organic compound dissolved in a mineral oil and diluted in a mixture of xylene and stock oil. The addition of stock oil makes it possible to reduce the differences in viscosity between samples and standards and improves their storage.

The solutions are introduced in aerosol form into an inductively coupled argon plasma. The phosphorus content is determined by comparing the emission of the element in the solution of the test portion of the sample with the emission of the standards at the same wavelength.

NOTE 1 The wavelengths commonly used are 213,6 nm and 178,3 nm.

The sample shall be diluted at least ten times with xylene in order to allow a proper introduction of the aerosol into the plasma.

NOTE 2 Xylene may be replaced by other suitable solvents in case of instable plasma or specific laboratory safety use.

Busta prova orale numero 6

La/Il Candidata/o discuta i seguenti quesiti:

Primo quesito

Caratteristiche del software necessario per la completa gestione di apparecchiature scientifiche, di recente produzione, come GC, HPLC, ICP-OES.

Secondo quesito

Calcolo delle prestazioni analitiche e ottimizzazione di uno spettrometro ICP-OES a lettura simultanea del segnale.

Terzo quesito

Modalità di acquisto di beni e servizi per il laboratorio chimico analitico nella PA con la procedura di affidamento: trattativa diretta.

INTERNATIONAL STANDARD ISO 16968:2015(E)

Solid biofuels — Determination of minor elements

1 Scope

This International Standard is intended for the determination of the minor elements Arsenic, Cadmium, Cobalt, Chromium, Copper, Mercury, Manganese, Molybdenum, Nickel, Lead, Antimony, Vanadium, and Zinc in all solid biofuels. Further, it describes methods for sample decomposition and suggests suitable instrumental methods for the determination of the elements of interest in the digests. The determination of other elements such as Selenium, Tin, and Thallium is also possible with the method described in this International Standard.

5 Principle

The analysis sample is digested in a closed vessel made from a fluoropolymer using nitric acid, hydrogen peroxide, and hydrofluoric acid in a microwave oven or a resistance oven or heating block. The digest is then diluted and the elements are determined with suitable instruments.