

APPENDIX VI

INFORMATION DOCUMENT ON THE HARMONIZATION OF NAMES AND FORMAT FOR PRINCIPLES IN CXS 234-1999

(For publication on the Codex website)

1. General Guideline

The term “principle” mentions only the description of the technique related to determining the test result (Annex A). The techniques used for sample preparation, extraction and separation were not included.

2. Definitions

For the purposes of alignment and harmonization regarding what is considered the principle of an analytical method, the definitions from the [ISO Online Browsing Platform \(OBP\)](#) apply.

In addition to the OBP, the following definitions apply:

- **Biological assay:** A technique to determine the concentration, potency or effect of a substance *in vivo* or *in vitro*.
- **Chromatography:** A technique of separation in which the components to be separated are distributed between two phases, one of which is stationary (stationary phase) while the other (the mobile phase) moves in a definite direction.
- **Titrimetry:** The quantitative determination of a given component in a solution by adding a liquid reagent of known concentration (titrant) until past an endpoint where all of the component has reacted with the titrant.
- **Volumetry:** A technique that determines the volume that a test item occupies.

3. Criteria Used

3.1. Assays Whose Results Are Method Dependent

- A. Description in the principle of the predominant method parameters (but not all the method parameters) that makes the result(s) method dependent, if necessary, for example: temperature, conversion factor;
- B. Description only of the analytical technique used to obtain the numerical value of a “provision”, since the other information is described in the methods. Therefore, the following may not be included, unless critical for the determination of the numerical value of the “provision”, for example: equipment, solvents or reagents used; and
- C. For tests that involve the culturing of microorganisms at a certain temperature, the temperature may be included in the “principle” description because it is critical for the determination of the correct result.

Examples:

Provision	Principle
Moisture	Gravimetry (drying at 105 °C)
Protein (Nx6.25)	Titrimetry and calculation
Carbohydrates	Calculation based on the results of moisture, protein, fat, ash and dietary fibre
Halphen test	Colorimetry
Net weight	Gravimetry
Foreign Matter	Visual examination - Gravimetry
Fat	Gravimetry
<i>Lactobacillus acidophilus</i>	Colony count at 37°C

3.2. Assays Whose Results Are Independent of the Method

For instrumental tests, the technique used must refer to the main equipment used, for example: for separation, and the detector used for determination. Ideally, these assays are collaboratively trialled, and where the measurand(s) are well defined entities, traceable to International System (SI) units.

Examples:

Provision	Principle
Aflatoxin M1	High Performance Liquid Chromatography with Fluorescence Detector (HPLC-LFD)
Fatty acids	Gas Chromatography with Flame Ionization Detector (GC-FID)
Nitrate	Ultraviolet-Visible (UV-Vis) Spectrometry
Manganese	Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES)
pH	Potentiometry
Mercury	Atomic Absorption Spectrometry with Cold Vapor Generator (CVAAS)

4. Additional Information

Considering the acceptance of the criteria described above, it is considered necessary to remove secondary information from method principles such as: “ashing”, “ceramic filter filtration”, “complexometry”, “centrifugation”, “weighing”, “distillation”, “enzymatic”, “flotation”, “single sulfation”, “sieving” unless critical to the method as the following examples:

- ‘Calcium - Complexometry titrimetry’ or ‘Complexometric titrimetry’ methods remain in CXS 234. Suggest as ‘Titrimetry - complexometric’
- ‘Determination of centrifugable pulp’ and ‘Solubility index’ provisions remain the principle ‘Centrifugation’ will need to be retained.
- The principle ‘Gravimetry - sieving’ should be retained.
- ‘Particle size (granularity) - Sieving’ or Particle size (granularity) - Gravimetry (sieving), then the principle ‘sieving’ or ‘Gravimetry (sieving)’ will need to be retained.

PRINCIPLES OF METHODS OF ANALYSIS

1. Anodic Stripping Voltammetry (ASV)
2. Atomic Absorption Spectrophotometry (AAS)
 - Cold Vapour (CVAAS)
 - Flame atomic absorption (FAAS)
 - Flow Injection Analysis (FIA AAS)
 - Graphite Furnace (GF AAS)
 - Hydride Generation (HG AAS)
3. Biological assay
 - Bioassay (in animals, tissue, plants)
 - Microbioassay
4. Immunoassay
 - Enzyme-Linked ImmunoSorbent Assay (ELISA)
5. Calculation
6. Colony count at (temperature) °C
7. Conductimetry/Resistivity
8. Confocal Laser Scanning Microscopy (CLSM)
9. Densitometry:
 - Hydrometer
 - Pycnometer
 - Digital Density
 - Vibratory density
10. DNA Assay
 - DNA Comet Assay
11. Polymerase chain reaction (PCR)
12. Electrophotometry
13. Enzymatic
14. Gravimetry
 - Incineration at (temperature) °C
 - Drying at (temperature) °C
 - Evaporation at (temperature) °C
 - Microwave oven drying
 - Röse-Gottlieb
 - Schmid-Bondzynski- Ratzlaff
 - Sieving
 - Soxhlet
 - Vacuum Drying at (temperature) °C
 - Weibull-Berntrop
15. Inductively Coupled Plasma (ICP)
 - Isotope Dilution Mass Spectrometry (ID MS)

- High Resolution Mass Spectrometry (HRMS)
- Mass Spectrometry (MS)
- Optical Emission Spectroscopy (OES)
- Collision/Reaction Cell Mass Spectrometry (CRCMS)
- Tandem Mass Spectrometry (MS/MS)

16. Chromatography

18.1 Liquid chromatography (LC):

- High Performance liquid chromatography (HPLC)
- Ultra-High Performance Liquid Chromatography (UHPLC)

Detector for HPLC and UHPLC:

- Charged Aerosol Detector (CAD)
- Diode Array Detector (DAD)
- Evaporative Light Scatter Detector (ELSD)
- Fluorescence Detector (FLD)
- Infrared (IR)
- Isotope Dilution Mass Spectrometry (ID MS)
- Mass Spectrometry (MS)
- High resolution Mass Spectrometry (HRMS)
- Isotope ratio Mass Spectrometry (IRMS)
- Pulsed amperometry detection (PAD)
- Refractive index (RI)
- Tandem Mass Spectrometry (MS/MS)
- Ultraviolet (UV)
- Ultraviolet-Visible (UV-Vis)

18.2 Gas chromatography (GC):

- Headspace (HS)
- Capillary gas chromatography (CGC)

Detector for HS and CGC:

- Electron Capture Detector (EC)
- Flame Ionization Detector (FID)
- Flame Photometric Detector (FPD)
- Mass Spectrometry (MS)
 - Nitrogen Phosphorus Detector (NPD)
 - Tandem Mass Spectrometry (MS/MS)
 - Thermal Conductivity Detector (TCD)
 - High Resolution Mass Spectrometry (HRMS)

18.3 Ion Exchange Chromatography (IC)

Detector for IC:

- Diode Array Detector (DAD)
- Electrochemical Detector (EC)

- Mass Spectrometry (MS)
- Pulsed Amperometric Detector (PAD)
- Refractive index (RI)
- Conductivity Detector (CD)
- Ultraviolet-Visible (UV-Vis)
- Variable Wavelength Detector (VWD)

18.4 Thin Layer Chromatography (TLC)

- High Performance Thin Layer Chromatography (HPTLC)
Detector for HPTLC:
 - Densitometric detector
 - Fluorescence (FLD)
 - Ultraviolet-Visible (UV-Vis)

19. Microscopy

- Electronic microscopy
- Optical microscopy

20. Flotation

21. Nephelometry

22. Nuclear Magnetic Resonance Spectroscopy (NMR)

23. Panel test

24. Photometry

25. Photostimulated Luminescence (PSL)

26. Polarimetry

27. Potentiometry

- Ion selective electrode (ISE)
- pH electrode (pH)

28. Refractometry

29. Receptor Binding Assay (RBA)

30. Sensory analysis

31. Spectrometry

- Fluorescence (FL)
- Isotope ratio mass spectrometry (IRMS)
- Ultraviolet (UV)
- Ultraviolet-Visible (UV-Vis)
- Mass spectrometry (MS)
- Tandem mass spectrometry (MS/MS)
- High resolution mass spectrometry (HRMS)
- Fluorometry

32. Spectroscopy

- Electron Spin Resonance (ESR)
- Fourier Transform Infrared (FTIR)
- Infrared Spectroscopy (IR)

- Mid-infrared (Mid-IR)
 - Near Infrared Reflectance (NIRS)
 - Raman (RS)
 - Cavity Ringdown Spectroscopy (CRDS)
33. Stable Isotope Ratio Mass Spectrometry (IRMS)
 34. Thawing
 35. Thermoluminescence
 36. Thermometry
 37. Titrimetry
 - Acidity
 - Complexometry
 - Coulometry
 - Electrochemical
 - Iodimetry & Iodometry
 - Karl Fischer
 - Kjeldahl Digestion
 - Lane & Eynon
 - Mohr
 - Potenciometry
 - Wijs
 - Argentometry
 - Alkalimetry
 38. Turbidimetry
 39. Visual examination
 - Count
 - Gravimetry
 - Macroscopy
 - Micrometry
 40. Volumetry
 41. Weighing

ANNEX B**ACRONYMS AND ABBREVIATIONS OF PRINCIPLES OF METHODS OF ANALYSIS¹**

AAS	Atomic Absorption Spectrophotometry
ASV	Anodic Stripping Voltammetry
CD	Conductivity Detector
CE	Capillary Electrophoresis
CLSM	Confocal Laser Scanning Microscopy
cPCR	Conventional Polymerase Chain Reaction
CRCMS	Collision/Reaction Cell Mass Spectrometry
CRDS	Cavity Ringdown Spectroscopy
CVAAS	Cold Vapour Atomic Absorption Spectrophotometry
DAD	Diode Array Detector
EC	Electrochemical Detector
ECD	Electron Capture Detector
IRMS	Isotope Ratio Mass Spectrometry
ISE	Ion Selective Electrode
ELISA	Enzyme-Linked ImmunoSorbent Assay
ESR	Electron Spin Resonance
FAAS	Flame Atomic Absorption Spectrophotometry
FIA	Flow injection Analysis
FID	Flame Ionization Detector
FLD	Fluorescence Detector
FPD	Flame Photometric Detector
FTIR	Fourier Transform Infrared Spectroscopy
GC	Gas Chromatography
GFAAS	Graphite Furnace Atomic Absorption Spectrophotometry
HGAAS	Hydride Generation Atomic Absorption Spectrophotometry
HPAEC	High Performance Anion Exchange chromatography
HPLC	High Performance Liquid Chromatography
HPTLC	High Performance Thin Layer Chromatography
HRMS	High Resolution Mass Spectrometry
IC	Ion Chromatography
ICP	Inductively Coupled Plasma
ID	Isotope Dilution
IMS	Isotope mass Spectrometry
IR	Infrared
IRS	Infrared Spectroscopy
LC	Liquid Chromatography

¹ The table will be included as an Annex to the *Recommended methods of analysis and sampling* (CXS 234-1999) and a link will be inserted in this document.

MALDI	Matrix-Assisted Laser Desorption Ionization
MS	Mass Spectrometry
MS/MS	Tandem Mass Spectrometry
NIRS	Near Infrared Reflectance Spectroscopy
NMR	Nuclear Magnetic Resonance Spectroscopy
NPD	Nitrogen Phosphorus Detector
OES	Optical Emission Spectrometry
PAD	Pulsed Amperometry Detection
PCR	Polymerase Chain Reaction
pH	pH electrode
PSL	Photostimulated Luminescence
qPCR	Real Time Qualitative Polymerase chain reaction
Q-ICPMS	Quadrupole Inductively couple plasma mass spectrometry
QTOF	Quadrupole Time-of-Flight
RI	Refractive Index
RS	Raman Spectroscopy
RT-PCR	Reverse Transcriptase PCR
TLC	Thin-Layer Chromatography
TOF	Time-of-Flight
UHPLC	Ultra-High Performance Liquid Chromatography
UV	Ultraviolet
UV-Vis	Ultraviolet-Visible
VWD	Variable Wavelength Detector

ANNEX C**LIST OF ACRONYMS FOR STANDARD METHOD REFERENCES²**

AACC	Cereals & Grains Association	(www.cerealsgrains.org/)
AIIBP	International Association of the Bouillon and Soup Industry	(www.culinaria-europe.eu/)
Anal. Chim. Acta.	Analytica Chimica Acta	(https://www.sciencedirect.com/journal/analytica-chimica-acta)
AOAC	AOAC INTERNATIONAL	(www.aoac.org/)
AOCS	American Oil Chemists' Society	(www.aocs.org/)
BS	British Standard	(www.bsigroup.com)
EN	European Standards	(www.en-standard.eu/)
EPA	Environmental Protection Agency	(www.epa.gov/)
EUsalt	European Salt Producers Association	(https://eusalt.com/)
FDA	Food and Drug Administration [Laboratory methods]	(www.fda.gov/)
ICC	International Association for Cereal Science and Technology	(https://icc.or.at/)
ICUMSA	International Commission for Uniform Methods of Sugar Analysis	(www.icumsa.org/)
IDF	International Dairy Federation	(https://fil-idf.org/)
IFU	International Fruit and Vegetable Juice Association [IFU Methods Analysis IFUMA]	(https://ifu-fruitjuice.com/)
IHC	International Honey Commission	(www.ihc-platform.net/)
ICA	International Confectionery Association	(www.international-confectionery.org/)
ICCO	International Cocoa Organization	(www.icco.org/)
IOC	International Olive Council	(www.internationaloliveoil.org/)
IS	Indian Standard	(www.bis.gov.in/)
ISI	International Starch Institute	(www.starch.dk/)
ISO	International Organization for Standardization	(www.iso.org/)
IUPAC	International Union of Pure and Applied Chemistry	(www.iupac.org/); (www.old.iupac.org/)
NMKL	Nordic-Baltic Committee on Food Analysis	(www.nmkl.org/)
OIV	International Organisation of Vine and Wine	(www.oiv.int/)
Ph. Eur	European Pharmacopoeia	(https://www.edqm.eu/en/the-european-pharmacopoeia)
USP	US Pharmacopeia	(www.usp.org/)
WEFTA	West European Fish Technologists Association	(www.wefta.org)

² The table will be included as an Annex to the *Recommended methods of analysis and sampling* (CXS 234-1999) and a link will be inserted in this document.