

Methods for the analysis of pewter — Determination of alloying and impurity element contents by atomic spectrometry

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National foreword

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 15 and a back cover.

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English version

Methods for the analysis of pewter - Determination of alloying and impurity element contents by atomic spectrometry

Méthodes d'analyse de l'étain pour la fabrication d'objets -
Détermination de la teneur en alliages et en impuretés par
spectrométrie atomique

Analyse von Zinnlegierungen - Bestimmung des Gehaltes
an Legierungs- und Verunreinigungselementen durch
Atomspektrometrie

This European Standard was approved by CEN on 8 October 1999.

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 220, Tin and tin alloys, the Secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2000, and conflicting national standards shall be withdrawn at the latest by May 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Within its programme of work, Technical Committee CEN/TC 220 requested CEN/TC 220/WG1, "Methods of analysis for tin and tin alloys", to prepare the following standard:

EN 12938 *Methods for the analysis of pewter — Determination of alloying and impurity element contents by atomic spectrometry.*

The annexes A and B are normative.

1 Scope

This European Standard specifies atomic spectroscopic methods (either AAS or AES) for the analysis of pewter alloy defined in EN 611-1.

NOTE This method is also suitable for inductively-coupled plasma emission spectrometry (ICP). It is written for use by experienced analysts familiar with atomic spectrometric techniques.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 611-1 *Tin and tin alloys — Pewter and pewterware — Part 1: Pewter*

3 Principle

The test sample is dissolved in hydrochloric acid plus nitric acid and tartaric or citric acid, and the concentration of the element sought is measured using atomic absorption spectrometry (AAS) or atomic emission spectrometry (AES). Interference is minimised by matching sample and standard materials and by the choice of instrument parameters.

For alloying amounts of silver dissolution of the sample in dilute nitric acid, followed by measurement as above.

4 Reagents

4.1 General

During the analysis, unless otherwise stated, use only reagents of recognised analytical grade and only distilled water or water of equivalent purity.

4.2 Hydrochloric acid, concentrated ($\rho \approx 1,18 \text{ g/ml}$).

4.3 Dilute hydrochloric acid (1 + 1). Dilute 100 ml hydrochloric acid (4.2) with 100 ml water.

NOTE For safety reasons, the acid should be added to the water.

4.4 Dilute hydrochloric acid (1 + 19). Dilute 10 ml hydrochloric acid (4.2) with 190 ml water.

NOTE For safety reasons, the acid should be added to the water.

4.5 Nitric acid, ($\rho \approx 1,42 \text{ g/ml}$).

4.6 Sulphuric acid, ($\rho \approx 1,84 \text{ g/ml}$).

4.7 Tartaric acid or citric acid.

4.8 Acid mixture. Add 250 ml hydrochloric acid (4.2) to 250 ml water. Cool. Add 250 ml nitric acid (4.5) and 50 g tartaric (or citric) acid (4.7). Dilute to 1 l with water.