INTERNATIONAL STANDARD 4883

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Hardmetals — Determination of contents of metallic elements by X-ray fluorescence — Solution method

Métaux-durs — Dosage des éléments métalliques par fluorescence de rayons X — Méthode par solution

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FOREWORD

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

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It has been approved by the member bodies of the following countries :

Australia	Germany	South Africa, Rep. of
Austria	Ireland	Spain
Bulgaria	Italy	Sweden
Canada	Japan	Turkey
Chile	Korea, Rep. of	United Kingdom
Czechoslovakia	Mexico	U.S.A
Egypt, Arab Rep. of	Poland	U.S.S.R
France	Romania	

No member body expressed disapproval of the document.

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Hardmetals — Determination of contents of metallic elements by X-ray fluorescence — Solution method

1 SCOPE

This International Standard specifies an X-ray fluorescence solution method for the determination of cobalt, iron, manganese, molybdenum, nickel, niobium, tantalum, titanium, tungsten, vanadium and zirconium contents of carbides and hardmetals.

2 FIELD OF APPLICATION

The method is applicable to

— carbides of niobium, tantalum, titanium, vanadium, tungsten and zirconium,

— mixtures of these carbides and binder metals,

— all grades of presintered or sintered hardmetals, produced from these carbides,

with the minimum element contents shown in table 1.

TABLE 1

Element	Minimum content % (*m/m*)
Co	0,05
Fe	0,05
Mn	0,05
Mo	0,05
Nb	0,07
Ni	0,05
Ta	0,10
Ti	0,2
V	0,05
W	0,10
Zr	0,05

3 PRINCIPLE

Measurement of the intensity of the characteristic X-ray spectrum of the elements being determined. To eliminate the effects of particle size and inter-element effects, the test portion is dissolved in a mixture of hydrofluoric and nitric acids.

4 INTERFERING ELEMENTS

The effect of interfering elements, such as line interference of titanium and tungsten on vanadium, shall be taken into account.

5 REAGENTS

During the analysis, use only reagents of recognized analytical grade, and only distilled water or water of equivalent purity.

5.1 Hydrofluoric acid, ρ 1,12 g/ml.

5.2 Nitric acid, ρ 1,42 g/ml.

5.3 Solvent solution.

Mix 2 parts of the hydrofluoric acid (5.1), 1 part of the nitric acid (5.2) and 2 parts of distilled water.

5.4 Tartaric acid solution, 200 g/l.

6 APPARATUS

Ordinary laboratory apparatus and

6.1 X-ray spectrometer, suitable for solution analysis.

6.2 Sample cells, resistant to hydrofluoric-nitric acid mixture, with a window consisting of 6 µm thick film of polyethylene terephthalic acid ester.

7 SAMPLING

7.1 The sample shall be crushed in a mortar made of a material which does not alter the sample composition. The crushed material shall pass a 2 mm sieve.

7.2 The analysis shall be carried out on two or three test portions.

8 PROCEDURE

8.1 Weigh 2 ± 0,001 g of the test sample into a 150 ml polypropylene beaker.

NOTE — If the sample includes lubricant, a correction for the lubricant content must be applied.

8.2 Add 20 ml of the solvent solution (5.3). Dissolve the test portion completely by heating on a water bath for 30 min.