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**Chemical analysis of refractories  
containing alumina, zirconia and silica —  
Refractories containing 5 % to 45 %  
of  $\text{ZrO}_2$  (alternative to the X-ray  
fluorescence method) —**

**Part 1:**

**Apparatus, reagents and dissolution**

*Analyse chimique des matériaux réfractaires contenant de l'alumine,  
de la zircone et de la silice — Matériaux réfractaires contenant de 5 %  
à 45 % de  $\text{ZrO}_2$  (méthode alternative à la méthode par fluorescence de  
rayons X) —*

*Partie 1: Appareillage, réactifs et dissolution*



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# Contents

Page

Foreword.....	iv
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions.....	2
4 Apparatus .....	2
5 Reagents .....	2
5.1 General .....	2
5.2 Standard solutions specific to ISO 21079 .....	2
6 Sampling .....	4
7 General procedures .....	5
8 Determination of loss on ignition.....	5
9 Decomposition of the sample and preparation of solutions used in the analysis .....	5
9.1 General decomposition techniques.....	5
9.2 Dissolution methods by fusion .....	5
9.3 Dissolution methods by hydrofluoric acid attack .....	8
10 Expression of test results .....	10
11 Examination and adoption of test results .....	10
12 Test report .....	11
Annex A (informative) References for stock solutions and blank solutions in this part of ISO 21079 .....	12
Bibliography .....	13

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 21079-1 was prepared by Technical Committee ISO/TC 33, *Refractories*.

ISO 21079 consists of the following parts, under the general title *Chemical analysis of refractories containing alumina, zirconia and silica — Refractories containing 5 % to 45 % of ZrO<sub>2</sub> (alternative to the X-ray fluorescence method)*:

- *Part 1: Apparatus, reagents and dissolution*
- *Part 2: Wet chemical analysis*
- *Part 3: Flame atomic absorption spectrophotometry (FAAS) and inductively coupled plasma emission spectrometry (ICP-AES)*

# Chemical analysis of refractories containing alumina, zirconia and silica — Refractories containing 5 % to 45 % of ZrO<sub>2</sub> (alternative to the X-ray fluorescence method) —

## Part 1: Apparatus, reagents and dissolution

### 1 Scope

This part of ISO 21079 specifies methods for the chemical analysis of AZS (alumina, zirconia, and silica) refractory products (containing 5 % to 45 % of ZrO<sub>2</sub>) and raw materials, using traditional (“wet”) methods, inductively coupled plasma atomic emission (ICP-AE) spectrometry and flame atomic absorption (FAA) spectrometry. It covers apparatus, reagents and dissolution methods.

The range of determination is given in Table 1.

**Table 1 — Range of determination (% by mass)**

Component	Range	Component	Range
LOI	–1 to 40	MgO	0,01 to 2
SiO <sub>2</sub>	0,1 to 45	Na <sub>2</sub> O	0,01 to 3
Al <sub>2</sub> O <sub>3</sub>	1 to 80	K <sub>2</sub> O	0,01 to 1
Fe <sub>2</sub> O <sub>3</sub>	0,01 to 2	Cr <sub>2</sub> O <sub>3</sub>	0,01 to 3
TiO <sub>2</sub>	0,01 to 5	ZrO <sub>2</sub>	5 to 45
CaO	0,01 to 2	HfO <sub>2</sub>	0,01 to 2
NOTE The values other than LOI are on an ignited basis.			

This part of ISO 21079 is not applicable to MgO-based refractories.

NOTE This part of ISO 21079 gives alternatives to the X-ray fluorescence (XRF) method given in ISO 12677.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 26845, *Chemical analysis of refractories — General requirements for wet chemical analysis, atomic absorption spectrometry (AAS) and inductively coupled plasma atomic emission spectrometry (ICP-AES) methods*