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Fluorspar — Technical grades — Chemical composition and physical characteristics

*Spathes fluor — Qualités techniques — Composition chimique
et caractéristiques physiques*



Reference number
ISO 8918:1996(E)

Foreword

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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.

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Fluorspar — Technical grades — Chemical composition and physical characteristics

1 Scope

This International Standard defines three technical grades of fluorspar traded on world markets, viz:

- acid grade;
- ceramic grade;
- metallurgical grade, comprising three types:
 - concentrate,
 - briquettes,
 - gravel.

It specifies the methods to be used for:

- a) sampling and sample preparation;
- b) determination of physical characteristics;
- c) chemical analysis.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

2.1 Sampling and sample preparation

ISO 8868:1989, *Fluorspar — Sampling and sample preparation*.

ISO 9497:1993, *Fluorspar — Experimental methods for evaluation of quality variation*.

ISO 9498:1993, *Fluorspar — Experimental methods for checking the bias of sampling and sample preparation*.

ISO 9499:1995, *Fluorspar — Method of determining the precision of sampling and sample preparation*.

2.2 Physical characteristics

ISO 4282:1992, *Acid-grade and ceramic-grade fluorspar — Determination of loss in mass at 105 °C*.

ISO 8875:1992, *All grades of fluorspar — Determination of moisture content of a lot*.

ISO 8876:1989, *Fluorspar — Determination of particle size distribution by sieving*.

2.3 Chemical analysis

ISO 3703:1993, *Acid-grade and ceramic-grade fluorspar — Determination of flotation agents*.

ISO 4283:1993, *All grades of fluorspar — Determination of carbonate content — Titrimetric method*.

ISO 4284:1993, *Acid-grade and ceramic-grade fluorspar — Determination of sulfide content — Iodometric method*.

ISO 5437:1992, *Acid-grade and ceramic-grade fluorspar — Determination of barium sulfate content — Gravimetric method*.

ISO 5438:1993, *Acid-grade and ceramic-grade fluorspar — Determination of silica content — Reduced-molybdenosilicate spectrometric method*.

ISO 5439:1978, *Acid-grade fluorspar — Determination of available fluorine content — Potentiometric method after distillation*.

ISO 6676:1993, *Acid-grade and ceramic-grade fluorspar — Determination of total phosphorus content — Reduced-molybdophosphate spectrometric method.*

ISO 9061:1993, *Acid-grade and ceramic-grade fluorspar — Determination of iron content — 1,10-Phenanthroline spectrometric method.*

ISO 9062:1992, *Acid-grade and ceramic-grade fluorspar — Determination of manganese content — Periodate spectrometric method.*

ISO 9438:1993, *Metallurgical-grade fluorspar — Determination of total phosphorus content — Reduced-molybdophosphate spectrometric method.*

ISO 9501:1991, *Metallurgical-grade fluorspar — Determination of total sulfur content — Iodometric method after combustion.*

ISO 9502:1993, *Metallurgical-grade fluorspar — Determination of silica content — Reduced-molybdosilicate spectrometric method.*

ISO 9503:1991, *Metallurgical-grade fluorspar — Determination of available fluorine content — Modified Willard-Winter method.*

ISO 9504:1993, *Metallurgical-grade fluorspar — Determination of antimony content — Solvent extraction atomic absorption spectrometric method.*

ISO 9505:1992, *All grades of fluorspar — Determination of arsenic content — Silver diethyldithiocarbamate spectrometric method.*

ISO 9779:1993, *Metallurgical-grade fluorspar — Determination of lead content — Solvent extraction atomic absorption spectrometric method.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 acid-grade fluorspar: A grade of fluorspar, high in calcium fluoride content, suitable for the manufacture of hydrofluoric acid.

3.2 ceramic-grade fluorspar: A grade of fluorspar, high in calcium fluoride content, suitable for use in the ceramic industry.

3.3 metallurgical-grade fluorspar: A grade of fluorspar suitable for use as a flux in the metallurgical industry.

4 Physical characteristics and chemical composition

4.1 The specific limits to the physical characteristics shall be negotiated between supplier and purchaser.

4.2 The specific limits to calcium fluoride content or available fluorine content and to any other constituents shall be negotiated between supplier and purchaser.

5 Test methods

5.1 Sampling and sample preparation

Sampling and sample preparation shall be carried out by the methods specified in 2.1.

5.2 Physical characteristics

The determination of loss in mass at 105 °C, moisture content of a lot and the particle size distribution by sieving shall be done by the respective methods specified in 2.2.

5.3 Chemical analysis

The chemical analysis shall be done by the methods specified in 2.3 for the constituents and grades as detailed in table 1.

Table 1 — Methods of chemical analysis

Constituent	Expressed as percentage of	Method to be used for				
		Acid grade	Ceramic grade	Metallurgical grades		
				Concentrate	Briquettes	Gravel
Flotation agents	Flotation agents	ISO 3703	ISO 3703			
Carbonate	CaCO ₃	ISO 4283	ISO 4283	ISO 4283	ISO 4283	ISO 4283
Sulfide	S	ISO 4284	ISO 4284			
Barium sulfate	BaSO ₄	ISO 5437	ISO 5437			
Silica	SiO ₂	ISO 5438	ISO 5438	ISO 9502	ISO 9502	ISO 9502
Available fluorine	CaF ₂ or F	ISO 5439	ISO 5439			
	CaF ₂			ISO 9503	ISO 9503	ISO 9503
Phosphorus	PO ₄ ³⁻	ISO 6676	ISO 6676	ISO 9438	ISO 9438	ISO 9438
Iron	Fe ₂ O ₃	ISO 9061	ISO 9061			
Manganese	Mn	ISO 9062	ISO 9062			
Sulfur	S			ISO 9501	ISO 9501	ISO 9501
Antimony	Sb			ISO 9504	ISO 9504	ISO 9504
Arsenic	As	ISO 9505	ISO 9505	ISO 9505	ISO 9505	ISO 9505
Lead	Pb			ISO 9779	ISO 9779	ISO 9779

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