

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 1694

CRYOLITE (NATURAL AND ARTIFICIAL)

DETERMINATION OF IRON CONTENT

1,10-PHENANTHROLINE PHOTOMETRIC METHOD

1st EDITION

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BRIEF HISTORY

The ISO Recommendation R 1694, *Cryolite (natural and artificial) – Determination of iron content – 1,10-phenanthroline photometric method*, was drawn up by Technical Committee ISO/TC 47, *Chemistry*, the Secretariat of which is held by the Ente Nazionale Italiano di Unificazione (UNI).

Work on this question led to the adoption of Draft ISO Recommendation No. 1694, which was circulated to all the ISO Member Bodies for enquiry in March 1969. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	India	South Africa, Rep. of
Austria	Iran	Spain
Belgium	Israel	Switzerland
Brazil	Italy	Turkey
Canada	Netherlands	U.A.R.
Czechoslovakia	New Zealand	United Kingdom
France	Norway	U.S.S.R.
Germany	Poland	Yugoslavia
Greece	Portugal	
Hungary	Romania	

No Member Body opposed the approval of the Draft.

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided to accept it as an ISO RECOMMENDATION.

CRYOLITE (NATURAL AND ARTIFICIAL)

DETERMINATION OF IRON CONTENT

1,10-PHENANTHROLINE PHOTOMETRIC METHOD

1. SCOPE

This ISO Recommendation describes a photometric method, using 1,10-phenanthroline, for the determination of the iron content of natural and artificial cryolite.

2. FIELD OF APPLICATION

The method is applicable to the determination of iron contents, expressed as Fe_2O_3 , greater than 0.020 % of natural and artificial cryolite.

NOTE. — The method is also suitable for application to the natural and synthetic materials having a molar ratio NaF/AlF_3 between 3 and 1.7.

3. PRINCIPLE

Dissolution of a test portion either by alkaline or acid fusion.

Preliminary reduction of iron (III) by means of hydroxylammonium chloride.

Formation of the complex iron (II)-1,10-phenanthroline in a buffered medium (pH value between 3.5 and 4.2).

Photometric measurement at a wavelength of about 510 nm.

4. REAGENTS

Distilled water or water of equal purity should be used in the test.

4.1 *Sodium carbonate*, anhydrous.

4.2 *Boric acid* (H_3BO_3).

4.3 *Potassium pyrosulphate* ($\text{K}_2\text{S}_2\text{O}_7$), finely crushed.

4.4 *Nitric acid*, approximately 8 N solution.

Dilute 540 ml of nitric acid, ρ 1.4 (g/ml), approximately 68 % (m/m) solution, with water and dilute to 1000 ml.