

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 602

DETERMINATION OF MINERAL MATTER IN COAL

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BRIEF HISTORY

The ISO Recommendation R 602, *Determination of Mineral Matter in Coal*, was drawn up by Technical Committee ISO/TC 27, *Solid Mineral Fuels*, the Secretariat of which is held by the British Standards Institution (BSI).

Work on this question by the Technical Committee began in 1955 and led, in 1961, to the adoption of a Draft ISO Recommendation.

In March 1964, this Draft ISO Recommendation (No.679) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies:

Australia	Germany	Switzerland
Austria	India	Turkey
Belgium	Italy	U.A.R.
Brazil	Korea, Rep. of	United Kingdom
Canada	Netherlands	U.S.A.
Chile	New Zealand	U.S.S.R.
Colombia	Poland	
Czechoslovakia	Republic	
Denmark	of South Africa	
France	Romania	

No Member Body opposed the approval of the Draft.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in July 1967, to accept it as an ISO RECOMMENDATION.

DETERMINATION OF MINERAL MATTER IN COAL

1. SCOPE

This ISO Recommendation describes a method of determining the amount of mineral matter in coal.

2. PRINCIPLE

A sample of the coal is partially demineralized by treatment with hydrochloric and hydrofluoric acids under such conditions that the coal substance remains unaffected. The loss in mass of the coal due to the acid treatment is recorded and the insoluble part of the mineral matter determined by ashing the partially demineralized coal. In addition, the iron content of the ash is determined so that the pyrites present in the extracted coal can be calculated. The amount of hydrochloric acid absorbed by the coal substance is also determined.

3. REAGENTS

All reagents should be of analytical reagent quality and distilled water should be used throughout.

3.1 **Hydrochloric acid**, *d* 1.18 or 1.19.

3.2 **Hydrochloric acid**, 5 N.

3.3 **Hydrofluoric acid**, *d* 1.13 or 1.14.

4. APPARATUS

All the apparatus listed below should be resistant to acids, especially hydrofluoric acid. A suitable material is polyvinyl chloride (P.V.C.). The balance used should be sensitive to 0.1 mg.

4.1 **Beaker**. A 200 ml beaker with a cover slip.

4.2 **Thermometer pocket**. A tube, sealed at one end, to carry a thermometer.

4.3 **Stirrer**.

4.4 **Wash-bottle**.

4.5 **Filter**, with a sintered alumina filter plate, as shown for example in the Figure, page 4.

4.6 **Filter flask**.

5. PROCEDURE

Before commencing the determination, mix the air-dried analysis sample of coal (see Note 1), ground to pass a sieve of 0.2 mm aperture, thoroughly for at least one minute, preferably by mechanical means.

Weigh accurately about 6 g of the sample into the beaker and add 40 ml of the hydrochloric acid (3.2) (see Note 2). Insert the stirrer and the tube carrying the thermometer and place the cover slip over the beaker. Place the beaker in a water bath, maintained at 55 to 60 °C. Stir the contents at 5 minute intervals, remove the beaker after 45 minutes and allow the coal suspension to settle for 10 minutes. Decant the solution through the filter (4.5) under suction.

Wash any coal on the filter with water, drain and transfer the coal back to the beaker with the aid of not more than 5 ml of water. Care is required to avoid loss of coal by splashing (see Note 3).