Australian Standard™

Methods for the analysis and testing of lower rank coal and its chars

Part 2: Lower rank coal—Determination of volatile matter

Standards Australia

This Australian Standard was prepared by Committee MN-001, Coal and Coke. It was approved on behalf of the Council of Standards Australia on 16 September 2002 and published on 1 October 2002.

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Australian Coal Association

Australian Coal Preparation Society

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PREFACE

This Standard was prepared by the Standards Australia Committee MN-001, Coal and Coke to supersede AS 2434.2—1985, *Methods for the analysis and testing of brown coal and brown coal char*, Part 2: *Determination of the volatile matter in low rank coal*.

The method differs from that given for higher rank coal (AS 1038.3, *Coal and coke—Analysis and testing, Part 3: Proximate analysis of higher rank coal*) in that there are two stages of heating to accommodate the large release of volatiles from low rank coal without loss of solids.

The volatile matter in low rank coal is determined as the loss in mass, less that due to moisture, when low rank coal is heated out of contact with air under standardized conditions. It is intended as a determination of the volatile organic fraction of the coal and it must be noted that, because of their large internal surface area, some low rank coals may contain significant amounts of inorganic matter which may be lost, or which may lose mass, during the test. An example is sodium chloride, which can be removed by prior washing of the sample with water.

The test is empirical, and in order to ensure reproducible results it is essential that the rate of heating, the final temperature, and the overall duration of the test are carefully controlled. Where the determination is performed on moist samples, the moisture content of the sample must be determined at the same time as the volatile matter, so that appropriate correction can be made.

The method of specifying the apparatus and procedure permits one or more determinations to be carried out simultaneously in the muffle furnace.

Heating in air of the residue from this volatile matter determination results in a slightly lower ash than by the direct determination used in AS 1038.3. Thus a fixed carbon measurement calculated from the volatile matter determination residue described in this Standard and its ash will give a result slightly higher than that using AS 1038.3.

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1 SCOPE

This Standard sets out a method for the determination of the volatile matter of air-dried low rank coal, either directly or with an initial oven drying.

2 REFERENCED DOCUMENTS

The following Standards are referred to in this Standard:

AS		
1038	Coal and coke—Analysis and testing	
1038.3	Part 3:	Proximate analysis of higher rank coal
1038.16	Part 16:	Assessment and reporting of results
2243	Safety in laboratories (series)	
2418	Coal and coke—Glossary of terms	
2508	Safe storage and handling information cards (series)	
2706	Numerical values—Rounding and interpretation of limiting values	
4264	Coal and coke—Sampling	
4264.3	Part 3:	Lower rank coal—Sampling procedures

3 DEFINITIONS

For the purpose of this Standard, the definitions given in AS 2418 apply.

4 PRINCIPLE

The coal is heated out of contact with air for 7 min at 400°C and then at 900°C for a further 7 min.

The percentage of volatile matter is calculated from the loss in mass of the sample. In the direct method the loss in mass due to moisture which is determined on a separate test portion taken from the same analysis sample at the same time, is deducted.

5 SAFETY

For information on laboratory safety, reference should be made to the relevant parts of AS 2243 and AS 2508.

6 REAGENTS

6.1 General

Unless otherwise specified, all reagents shall be of analytical reagent grade, and only distilled water, or water of equivalent purity, shall be used.