

Australian Standard[®]

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

**Part 8: Lower rank coal—
Determination of ash**

This Australian Standard was prepared by Committee MN/1, Coal and Coke. It was approved on behalf of the Council of Standards Australia on 27 May 1993 and published on 13 September 1993.

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Australasian Institute of Mining and Metallurgy
Australian Chamber of Commerce and Industry
Australian Coal Association
Australian Coal Industry Research Laboratories
Australian Coal Preparation Society
Australian Institute of Energy
Australian Mining Industry Council
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This Standard was issued in draft form for comment as DR 92172.

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First published as AS 2434.8—1993.

PREFACE

This Standard was prepared by the Standards Australia Subcommittee on Lower Rank Coal, under the supervision of the Committee on Coal and Coke and the direction of the Multitechnics Standards Policy Board, as an extension of the series of Standards for the testing of lower rank coal.

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FOREWORD

During the incineration of lower rank coal, most of the inorganic species such as sodium, calcium, magnesium and iron undergo chemical changes. These changes generally involve oxidation and sulfation (and other reactions) and result in the residual ash having a much higher mass than the mineral and inorganic matter originally present in the coal. This mass increase occurs despite the possibility of decreases in mass during incineration because of losses of sodium chloride. However, in the case of coals having very high sodium chloride content, the mass losses may exceed the mass increases. The determination of ash is empirical because the conditions of incineration control the extent to which these and other chemical changes occur. The ash so determined is not necessarily of the same magnitude and composition as the ash from combustion under other conditions. It is essential, therefore, to adhere strictly to the procedure specified. A moisture determination is carried out concurrently.

STANDARDS AUSTRALIA

Australian Standard

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

Part 8: Lower rank coal—Determination of ash

1 SCOPE This Standard sets out a method for the determination of ash in lower rank coal.

2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

1038 Coal and coke—Analysis and testing

1038.16 Part 16: Acceptance and reporting of results

2243 Safety in laboratories

2434 Methods for the analysis and testing of lower rank coal and its chars

2434.7 Part 7: Determination of moisture in the analysis sample of lower rank coal

2508 Safe storage and handling information cards for hazardous materials

2706 Numerical values—Rounding and interpretation of limiting values

3 PRINCIPLE A known mass of coal is heated in air to 500°C in 30 min, maintained at this temperature for 30 min, then heated to 815°C until incineration is complete. The percentage of ash is calculated from the mass of the residue remaining after incineration.

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

5 SAMPLE

5.1 General The sample shall be the analysis sample prepared to a nominal top size of 212 µm.

5.2 Equilibration of the sample The moisture content of the analysis sample shall be equilibrated with the laboratory atmosphere by exposure in a thin layer on a tray. Exposure time shall be kept to a minimum. The sample shall be thoroughly mixed immediately before analysis.

6 APPARATUS

6.1 Muffle furnace The furnace shall be capable of—

- achieving an adequate zone at a uniform temperature of 500 ±10°C in 30 min from room temperature;
- being maintained at this temperature, and of then being raised to 815 ±10°C; and
- maintaining an adequate zone at the latter temperature condition.

The ventilation system shall be capable of at least 10 to 12 atmosphere changes per minute at 500 ±10°C.