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.

The following interests are represented on Committee MN/1:

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

Bureau of Steel Manufacturers of Australia

CSIRO, Division of Coal & Energy Technology

Department of Resource Industries, Queensland

Electricity Supply Association of Australia

Institution of Engineers, Australia

National Association of Testing Authorities, Australia

Queensland Coal Board

Royal Australian Chemical Institute

Standing Committee on Coalfield Geology of New South Wales

University of Newcastle

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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 furnance shall be capable of—

(a) achieving an adequate zone at a uniform temperature of 500 ±10°C in 30 min from room temperature;

(b) being maintained at this temperature, and of then being raised to 815 ±10°C; and

(c) 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.