Australian Standard™

Coal and coke—Analysis and testing

Part 6.3.2: Higher rank coal and coke—Ultimate analysis—Total sulfur—High-temperature combustion method

Standards Australia

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PREFACE

This Standard was prepared by the Standards Australia Subcommittee MN-001-01, Coal Evaluation under the supervision of Committee MN-001, Coal and Coke, as a revision of AS 1038.6.3.2—1997, to standardize specific technical aspects, (such as the concentration of mercury (II) oxycyanide), between this Standard and AS 1038.8.2, *Coal and coke—Analysis and testing*, Part 8.2: *Coal and coke—Chlorine—High-temperature combustion method* as both standard methods use similar chemical principles and reagents.

The objective of this Standard is to provide those responsible for the testing of coal and coke with a standardized procedure for the determination of the total sulfur content by high-temperature combustion and titration.

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FOREWORD

The ultimate analysis of coal and coke comprises the determination of the elements carbon, hydrogen, nitrogen and sulfur. Determination of the total amounts of these elements, regardless of their origin, is described in the AS 1038.6 series. Carbon includes that which is present in the mineral carbonates and hydrogen includes that which is present both in the moisture (for which a correction is made in the calculation) and in water of constitution of the argillaceous constituents of the mineral matter. All nitrogen is assumed to be present in the carbonaceous substance. Sulfur is normally present in three forms: inorganic sulfides such as pyrite (FeS_2), inorganic sulfates associated with the mineral matter and organic sulfur in the carbonaceous substance.

An estimate of the percentage of oxygen on an air-dry basis can be obtained by subtracting the sum of the determined percentages of moisture, ash, carbon, hydrogen, nitrogen and sulfur from 100. The value thus obtained should be termed ‘oxygen by difference’ (see AS 1038.16). A more satisfactory value for oxygen by difference is obtained when the ultimate analysis is expressed on a dry, mineral matter-free basis after making all appropriate corrections.

This Standard covers the determination of total sulfur, using the method of high temperature combustion followed by base-acid titration.

STANDARDS AUSTRALIA

Australian Standard

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1 SCOPE

This Standard sets out a method for the determination of total sulfur in the analysis sample of higher rank coal and coke by the high-temperature combustion method.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

1038		Coal and coke—Analysis and testing
1038.3	Part 3:	Proximate analysis of higher rank coal
1038.4	Part 4:	Coke—Proximate analysis
1038.6.1	Part 6.1:	Higher rank coal and coke—Ultimate analysis—Carbon and hydrogen
1038.8.2	Part 8.2:	Coal and coke—Chlorine—High-temperature combustion method
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		Numeric values—Rounding and interpretation of limiting values
4264		Coal and coke—Sampling
4264.1	Part 1:	Higher rank coal—Sampling procedures
4264.2	Part 2:	Coke—Sampling procedures

BS

1752		Laboratory sintered or fritted filters

3 DEFINITIONS

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

3.1 Repeatability (*r*)

The value at or below which the absolute difference between two single test results obtained with the same method on identical test material under the same conditions (same operator, same apparatus, same laboratory and the minimum practical time consistent with separate tests) may be expected to lie with the specified probability. In the absence of other specifications, the probability is 95%.

4 PRINCIPLE

A known mass of the sample is burnt in a stream of oxygen in a tube furnace at 1350°C Aluminium oxide is added to modify the rate of combustion of the sample. The oxides of