

Australian Standard™

Coal and coke—Analysis and testing

**Part 14.3: Higher rank coal ash and coke
ash—Major and minor elements—
Wavelength dispersive X-ray
fluorescence spectrometric method**

This Australian Standard was prepared by Committee MN/1, Coal and Coke. It was approved on behalf of the Council of Standards Australia on 5 October 1999 and published on 5 November 1999.

The following interests are represented on Committee MN/1:

Australasian Institute of Mining and Metallurgy
Australian Coal Association
Australian Coal Preparation Society
Australian Institute of Energy
Bureau of Steel Manufacturers of Australia
Coalfield Geology Council of N.S.W.
CSIRO, Division of Energy Technology
Department of Mines & Energy, Qld
Electricity Supply Association of Australia
Institute of Engineers, Australia
Minerals Council of Australia
University of Newcastle
University of New South Wales
University of Queensland

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Australia web site at www.standards.com.au and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Australian Standard*, has a full listing of revisions and amendments published each month.

We also welcome suggestions for the improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.com.au, or write to the Chief Executive, Standards Australia International Ltd. PO Box 1055, Strathfield., NSW 2135.

Australian Standard™

Coal and coke—Analysis and testing

**Part 14.3: Higher rank coal ash and
coke ash—Major and minor elements—
Wavelength dispersive X-ray
fluorescence spectrometric method**

First published as AS 1038.14.3—1999

COPYRIGHT

© Standards Australia International

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Published by Standards Australia International Ltd
PO Box 1055, Strathfield, NSW 2135, Australia

ISBN 0 7337 3008 6

PREFACE

This Standard was prepared by the Standards Australia Committee MN/1, Coal and Coke, as an additional method in the series of standard methods for the analysis and testing of coal and coke.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

CONTENTS

	<i>Page</i>
1 SCOPE	3
2 REFERENCED DOCUMENTS	4
3 DEFINITIONS	4
4 PRINCIPLE	4
5 SAFETY	4
6 REAGENTS	4
7 APPARATUS	5
8 SAMPLE	5
9 PROCEDURE	6
10 CALCULATION	9
11 REPORTING OF RESULTS	9
12 PRECISION	10
13 TEST REPORT	10
 APPENDICES	
A ACCEPTANCE OF ANALYTICAL RESULTS FOR LABORATORY METHOD	11
B REAGENTS SUITABLE FOR THE PREPARATION OF SYNTHETIC CALIBRATION STANDARDS	13
C STANDARD DEVIATION OF GLASS DISC PREPARATION	14
D PRECISION DATA FOR ELEMENTAL ANALYSIS OF COAL ASH AND COKE ASH	16

STANDARDS AUSTRALIA

Australian Standard

Coal and coke—Analysis and testing

Part 14.3: Higher rank coal ash and coke ash—Major and minor elements—Wavelength dispersive X-ray fluorescence spectrometric method

1 SCOPE This Standard sets out a wavelength dispersive X-ray fluorescence procedure for the determination of silicon, aluminium, iron, calcium, magnesium, sodium, potassium, titanium, manganese, phosphorus and sulfur.

The method is applicable to coal ashes, coke ashes and boiler ashes having components of concentration ranges specified in Table 1.

TABLE 1
RANGES OF APPLICATION OF
THE METHOD

Oxide	Concentration range, %
SiO ₂	5 to 100
Al ₂ O ₃	5 to 80
Fe ₂ O ₃	0.1 to 25
CaO	0.05 to 25
MgO	0.05 to 25
Na ₂ O	0.05 to 5
K ₂ O	0.05 to 5
TiO ₂	0.05 to 5
Mn ₃ O ₄	0.005 to 5
P ₂ O ₅	0.01 to 5
SO ₃	0.05 to 10

NOTES:

- 1 Additional analytes may be included in the method provided appropriate validation using Certified Reference Materials (CRM) is carried out.
- 2 The precision statistics reported in Appendix D are only robust for the concentration ranges included in the test program. Outside of these ranges precision should be determined using suitable Certified Reference Materials.
- 3 The method has been tested for the following additional analytes; BaO (0.01 to 1%); SrO (0.01 to 1%) and ZnO (0.005 to 1%).