Report on Preparation and Certification of Australian Coal Industry Reference Samples

General Coal Reference Sample (ACIRS – G4-2012).

Report No: AD-G4 -2012

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ANALYSIS AND TESTING REPORT

General Coal Reference Sample
(ACIRS – G4-2012).

1. Introduction

This report describes the preparation and analysis of ACIRS-G4-2012, which comprises a sealed jar of coal used in the determination of various elements and properties of coals.

The end use of these samples is as a quality control tool and to calibrate analytical elemental instruments.

2. Previous ACIRS- G series Preparation

ACIRS-G3-2010 released for sale 05-11-2010

3. Sample preparation

Approximately a 180 kg sample of bulk material from a colliery in the Northern Bowen Basin, Queensland, and of −50 mm size was obtained.

The material was stabilised in storage for several months before being crushed, air-dried and pulverised in a swing hammer mill to a nominal top size of 4 mm. The pulverised coal was repeatedly mixed by rotary sample division (RSD).

The coal was then milled to a nominal top size of 212μm and the product placed in plastic bags in plastic jars each containing approximately 250g.

11% of the jars were randomly selected and tested for homogeneity by determining and recording the ash and moisture content of each.

4. Test program

Jars of the product were used in a test program organized by ALS, Gladstone. 28 laboratories participated in the program who were asked to undertake determinations and to submit duplicate results on a dry basis for each test.

BMA, Gladstone, carried out the statistical analysis and the complete results were checked by the ACIRS Steering Committee.

5. Statistical analysis of results

Statistics for the sample were generated using robust statistical procedures which included the number of results, median, range, repeatability and reproducibility.

Table 1
Outcome of statistical processing

Test	No. of laboratories returning results	No of determinations considered:		Notes
		for ACIRS stats	for final certified values	
Ash	28	28	26	
Volatile Matter	28	28	27	
Total Carbon	9	9	7	Indicative
Hydrogen	9	9	7	Indicative
Nitrogen	8	8	8	Indicative
Total Sulfur	27	27	27	
Pyritic Sulfur	2	2	2	Indicative
Sulfate Sulfur	2	2	2	Indicative
Chlorine	12	12	12	
Phosphorus	10	10	9	
Carbonate Carbon	9	9	7	Indicative
Relative Density	21	21	21	
Gross calorific value	25	25	22	

6. Certified Values

Table 2
ACIRS – G4 – 2012 Certified Values

Determinations	Mean	SD
Ash	10.62 % dry basis	0.093
Volatile Matter	20.32 % dry basis	0.191
Total Sulfur	0.567 % dry basis	0.014
Chlorine	0.040 % dry basis	0.005
Phosphorus	0.026 % dry basis	0.003
Relative Density (dry basis)	1.37	0.017
Gross calorific value	32.42 MJ/kg dry basis	0.102
Indicative values		
Total Carbon	79.38 %dry basis	0.330
Hydrogen	4.39 % dry basis	0.091
Nitrogen	1.78 % dry basis	0.067
Carbonate Carbon	0.040 % dry basis	0.010
Pyritic Sulfur	0.041 % dry basis	0.008
Sulfate Sulfur	0.11 % dry basis	0.010

Australian Coal Industry Reference Sample (ACIRS)

Certified reference coal ACIRS- G4-2012

Certificate of Analysis

Certified values		Standard deviation
Ash	10.62 % dry basis	0.093
Volatile Matter	20.32 % dry basis	0.191
Total Sulfur	0.567 % dry basis	0.014
Chlorine	0.040 % dry basis	0.005
Phosphorus	0.026 % dry basis	0.003
Relative Density	1.37	0.017
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Indicative values only		
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Carbonate Carbon	0.040 % dry basis	0.010
Pyritic Sulfur	0.041 % dry basis	0.008
Sulfate Sulfur	0.011 % dry basis	0.010

NOTE: To minimise deterioration of the samples, containers should be kept tightly sealed and the samples stored in a cool, dark place.