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Certificate No. Q3993

BRITISH CHEMICAL STANDARD CERTIFIED REFERENCE MATERIAL

CERTIFICATE OF ANALYSIS BCS-CRM No. 375/1 SODA FELDSPAR

Prepared under rigorous laboratory conditions and, AFTER CERTIFICATION ANALYSIS IN CANADA, FRANCE, GERMANY, GREAT BRITAIN, INDIA AND USA, issued by the Bureau of Analysed Samples Ltd.

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ANALYSES

Mean of 4 values - mass content in %. All results relate to the dried (110°C) sample.

Analyst No.	SiO ₂	TiO ₂	Al ₂ O ₃	Fe ₂ O ₃	Na ₂ O	K ₂ O	CaO	MgO	P ₂ O ₅	LOI
1	17.7775	...	8.9800
2	69.3650	0.3070	17.8725	0.2835	8.7768	1.4778	0.7568	0.1840	0.2373	0.6570
3	69.2780	0.3369	17.8931	0.2981	8.7138	1.4437	0.7998	0.1855	0.2234	0.7511
4	69.1168	0.2968	17.9065	0.2903	8.7158	1.4883	0.7660	0.2048	0.2168	0.7700
5	...	0.3200	...	0.2725	8.9775	1.5200	0.7750	...	0.2050	0.6725
6	69.2032	0.3227	18.0774	...	8.5195	1.4366	0.8151	...	0.2343	0.7170
7	69.2973	0.3038	17.7868	0.3098	8.7448	1.4810	0.8195	0.1708	0.2043	0.6898
8	69.3358	0.3230	17.9313	0.2780	9.0103	1.4600	0.7560	0.1903	...	0.7118
9	...	0.2973	17.7460	0.3030	9.2345	1.4650	0.7330	0.1533	0.2610	0.7645
10	69.2000	...	18.0000	0.2950	9.2500	1.4225	0.8350	0.1675	0.2275	...
M_M	69.2566	0.3134	17.8879	0.2913	8.8923	1.4661	0.7839	0.1795	0.2262	0.7167
<i>s_M</i>	0.0873	0.0144	0.1081	0.0127	0.2383	0.0297	0.0348	0.0169	0.0186	0.0424
<i>s_w</i>	0.0818	0.0116	0.0579	0.0059	0.0334	0.0123	0.0119	0.0061	0.0065	0.0181

M_M: Mean of the intralaboratory means. *s_M*: standard deviation of the intralaboratory means. *s_w*: intralaboratory standard deviation.

The above figures are those which each Analyst has decided upon after careful verification

CERTIFIED VALUES (C_v)

mass content in %

	SiO ₂	TiO ₂	Al ₂ O ₃	Fe ₂ O ₃	Na ₂ O	K ₂ O	CaO	MgO	P ₂ O ₅	LOI
C_v	69.26	0.313	17.89	0.291	8.89	1.47	0.78	0.180	0.226	0.72
C(95%)	0.08	0.012	0.08	0.011	0.17	0.03	0.03	0.016	0.016	0.04

The half width confidence interval $C(95\%) = \frac{t \times s_M}{\sqrt{n}}$ where "t" is the appropriate Student's t value and "n" is the number of acceptable mean values

For further information regarding the confidence interval for the certified value see ISO Guide 35:1989 section 4.

DESCRIPTION OF SAMPLE

The sample consists of material passing a 250µm aperture sieve. It is sold in bottles containing 100g.

TRACE ELEMENTS

Mass content in µg/g

Element	Ba	Ce	Cr	Cs	Eu	Ga	Hf	La	Nb	Nd	Pb	Rb	Sc	Sm	Sr	Th	U	Y	Yb	Zn	Zr
µg/g	95	54	12	1	1	17	3	26	15	22	4	52	6	5	101	10	2	18	1	4	79

This table of Trace Elements gives the mean of the mean values obtained by two or more of the Participating Analysts.

These values are given for information only.

BCS-CRM No. 375/1
SODA FELDSPAR
NOTES ON METHODS USED

SILICA

All Analysts except Nos. 3 and 8 determined silica by X-Ray Fluorescence Spectrometry (XRF) using a fused bead technique. Analysts Nos. 3 and 8 determined silica gravimetrically. No. 3 determined residual silica in the filtrate photometrically.

TITANIA

All Analysts except No. 3 determined titania by XRF using a fused bead technique. Analyst No. 3 determined titania photometrically with diantipyrylmethane.

ALUMINA

All Analysts except Nos. 1, 3 and 8 determined alumina by XRF using a fused bead technique. Analyst Nos. 1 and 8 determined alumina using complexometric titration after separation with cupferron. No. 3 determined alumina gravimetrically with 8-hydroxyquinoline.

IRON OXIDE

All Analysts except Nos. 3 and 8 determined iron oxide by XRF using a fused bead technique. Analyst No.3 determined iron oxide photometrically with o-phenanthroline. Analyst No. 8 used Flame Atomic Absorption Spectrometry (FAAS).

SODIUM OXIDE

All Analysts except Nos. 3 and 8 determined sodium oxide by XRF using a fused bead technique. Analyst No. 3 used FAAS and No. 8 used Flame Emission Spectrometry (FES)

POTASSIUM OXIDE

All Analysts except Nos. 3 and 8 determined potassium oxide by XRF using a fused bead technique. Analyst No. 3 used FAAS and No. 8 used FES.

CALCIUM OXIDE

All Analysts except Nos. 3 and 8 determined calcium oxide by XRF using a fused bead technique. Analysts Nos. 3 and 8 used FAAS.

MAGNESIA

All Analysts except Nos. 3 and 8 determined magnesia by XRF using a fused bead technique. Analysts Nos. 3 and 8 used FAAS.

PHOSPHORUS PENTOXIDE

All Analysts except No. 3 determined phosphorus pentoxide by XRF using a fused bead technique. Analyst No. 3 determined phosphorus pentoxide photometrically as phosphovanadomolybdate.

LOSS ON IGNITION

All Analysts determined the loss on ignition gravimetrically by heating at $1025^{\circ} \pm 25^{\circ}\text{C}$ to constant weight.

TRACE ELEMENTS

Analysts Nos. 4 and 6 determined trace elements using XRF, No. 4 used a press powder technique. Analyst No. 11 used Neutron Activation Analysis and Analyst No. 12 used Inductively Coupled Plasma- Mass Spectrometry.

INTENDED USE & STABILITY

This sample is intended for the verification of analytical methods, such as those used by the participating laboratories, for the calibration of analytical instruments in cases where the calibration with primary substances (pure metals or stoichiometric compounds) is not possible and for establishing values for secondary reference materials.

It will remain stable provided that the bottle remains sealed and is stored in a cool, dry atmosphere. When the bottle has been opened the lid should be secured immediately after use. If the contents should become discoloured (e.g. oxidised) by atmospheric contamination they should be discarded.

TRACEABILITY

The traceability of this BCS-CRM is ensured by the use of either stoichiometric analytical techniques or methods which are calibrated against pure metals or stoichiometric compounds.

This Certified Reference Material has been prepared in accordance with the recommendations specified in ISO Guides 30 to 35, available from the International Standards Organisation in Geneva.

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For BUREAU OF ANALYSED SAMPLES LTD.
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