Central Geological Laboratory

MONGOLIA

CATALOGUE

Reference Materials

2016

Contents Page

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Foreword

Worldwide millions of analytical measurements are performed every year. Test results influence important decisions in industry, trade, policy and environmental control. In a globalized world they should be comparable everywhere and as reliable as possible.

Certified Reference Materials establish worldwide confidence in the quality and comparability of measurements!

The Central Geological Laboratory of Mongolia (CGL) was founded in 1957 and is specialized in analyzing the quantitative chemical and mineralogical composition of materials of geological origin (e.g. soils, rocks, ores, concentrates). Classical wet-chemical and modern instrumental analytical test methods like AAS, ICP-OES and WD-XRF are applied for quantitative analysis. A modern and efficient quality management system and the regular participation in the GeoPT proficiency testing scheme guarantees best practises in testing and CRM-manufacturing.

Since 2000 the CGL was accredited for testing by the Mongolian National Agency for Metrology and Standardization (MASM). In 2005, CGL was accredited as testing laboratory (ISO /IEC 17025) by the ILAC member and German accreditation body DAkkS. CGL is accredited as CRM producer (ISO17025/ISO 34) in 2012 and Proficiency Testing Provider (ISO/IEC 17043:2015) in 2015 as well. The accreditation had been regularly extended and it is still valid.

Alongside its analytical activities, since 40 years, CGL produces Certified Reference Materials of geological origin for the national public sector. So far 90 RMs of various kinds of rocks, ores, mineral processing products and environmental materials were certified at different levels, national and international. Actually the development of matrix reference materials at CGL follows the ISO Guide 30-series and CGL can offer the service to develop fit-for-purpose-Reference Materials for qualified prospects on order.
This catalogue directed to analytical research workers and professionals in the field of mineral resources and quality assurance. This catalogue will not deputize certificate of CRMs.

Standards and Guides applied for the development of CGL CRMs

Internatioal Association of Geoanalysts' Protocol for the Certificaion of Geological and Environmental Reference Materials, International Association of Geoanalysts, 2003

MNS ISO Guide 30:2015, Terms and definitions used in connection with reference materials

MNS ISO Guide 31:2015, Contents of certificates of reference materials

MNS ISO Guide 32:2001, Calibration in analytical chemistry and use of certified reference materials

MNS ISO Guide 33:2015, The uses of reference materials

ISO Guide 34:2009, General requirements for the competence of reference material producers

MNS ISO Guide 35:2005, Certification of reference materials – General and statistical principles

ISO Guide 35:2006, Certification of reference materials – General and statistical principles

СТ СЭВ 5892-87, ГОСТ 27872-88, Метрология. Стандартные образцы. Методика изготовления и аттестации стандартных образцов состава горных пород и минерального сырья

CGL coding convention for CRMs

CGL code	Type
CGL 001-099	Rocks
CGL 101-199	Ores
CGL 201-299	Mineral processing products
CGL 301-399	Environmental materials
CGL 401-499	Combustion raw materials

How to use the catalogue

Table 1:

Classified by types of material according to the above mentioned coding system the table gives an overview on all CGL CRMs and helps to find materials of interest. The relevant **CGL code** number is the guide to further information on the chosen material in the catalog.

Table 2:

Certified values for CRMs are listed separately for major and trace elements

Table 3:

The table gather certified values for a single element or compound from the whole set of CGL CRM. Parameters of measurement uncertainty are listed according to their availability.

Confidence interval ($_{\Delta}x$) – error characteristic

We would be glad to receive your order. Please direct your requests to following address:

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Table 1 **ROCKS**

CERTIFIED REFERENCE MATERIALS FROM MONGOLIA

CGL code	Description	Designation	Certified values (n)	Registration number	Certifying body	Page
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS	12	USZ 24.99	IAG, Mongolia, MNCSM	11-18
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	30	USZ 28.99	IAG, Mongolia, MNCSM	11-18
CGL 003	Graphite	BJBCh	16	USZ 32.2000	Mongolia, MNCSM	11-18
CGL 004	Graphite	ZBCh	10	USZ 33.2000	Mongolia, MNCSM	11-18
CGL 005	Magnesite	GM	8	USZ 37.2003	Mongolia, MNCSM	11-18
CGL 006	Nepheline syenite	LNS	29	USZ.45.2007	Mongolia, MNCSM	11-18
CGL 007	Basalt	MBL-1	53	USZ 46.2008	Mongolia, MNCSM	11-18
CGL 008	Granite	MGT-1	56	USZ 47.2008	Mongolia, MNCSM	11-18
CGL 009	Andesite	MGL-AND	37	USZ 48.2009	Mongolia, MNCSM	11-18
CGL 010	Zeolite, spiked	MGL-ZEO-S	33	USZ 49.2009	Mongolia, MNCSM	11-18

Table 1 (continued) **ROCKS**

CERTIFIED REFERENCE MATERIALS FROM MONGOLIA

CGL code	Description	Designation	Certified values (n)	Registration number	Certifying body	Page
CGL 011	Diorite	MDR	33	USZ 50.2009	Mongolia, MNCSM	11-18
CGL 012	Gabbro	MGR-T	26	USZ 51.2009	Mongolia, MNCSM	11-18
CGL 013	Gabbro	MGR-N	22	USZ 52.2010	Mongolia, MNCSM	11-18
CGL 014	Basalt	MBL-D	28	USZ 53.2010	Mongolia, MNCSM	11-18
CGL 015	Nepheline syenite	HNS	28	USZ 54.2011	Mongolia, TC of CGL	11-18
CGL 017	Natural Zeolite	M-ZEO-N	19	USZ 63.2013	Mongolia, TC of CGL	11-18
IAG/CGL 018	Rhyolite	MRH-1	45		IAG, STC of CGL	11-18
IAG/CGL 019	Trachyandesite	MTA-1	48		IAG, STC of CGL	11-18
IAG/CGL 020	Limestone	ML-3	48		IAG, STC of CGL	11-18
CGL 021	Dolomite	MDL	8		Mongolia, STC of CGL	11-18
CGL 022	Greisen	MGn	22	USZ 64.2013	Mongolia, TC of CGL	11-18

Table 1 (continued) **ORES**

CERTIFIED REFERENCE MATERIALS FROM MONGOLIA

CGL code	Description	Designation	Certified values (n)	Registration number	Certifying body	Page
CGL 101	Fluorspar	HJ	7	UST 3138-81 ST SEV 2298-80	Mongolia, MASM, PCS of CMEA	19-28
CGL 102	Phosphorite	HF	7	ST SEV 3530-82	PCS of CMEA	19-28
CGL 104	Silver ore	AAg-150 RS-1	5	USZ 7.91 GSO 6357-92	Mongolia, MASM, ASRIMRM	19-28
CGL 105	Silver ore	AAg-300 RS-2	18	USZ 8.91 GSO 6358-92	Mongolia, MASM, ASRIMRM	19-28
CGL 106	Silver ore	AAg-700 RS-3	4	USZ 9.91 GSO 6359-92	Mongolia, MASM, ASRIMRM	19-28
CGL 107	Phosphorite	BF	9	USZ 14.94	Mongolia, MASM	19-28
CGL 108	Silver -bearing complex ore	TsAg	13	USZ 17.94	Mongolia, MASM	19-28
CGL 109	Gold-quartz ore	ZB-1	12	USZ 20.98	Mongolia, MASM	19-28
CGL 110	Gold ore	ZB-2	1	USZ 21.98	Mongolia, MASM	19-28

Table 1 (continued) **ORES**

CERTIFIED REFERENCE MATERIALS FROM MONGOLIA

CGL code	Description	Designation	Certified values (n)	Registration number	Certifying body	Page
CGL 111	Rare earth ore	TRM-2	40	USZ 25.2006	Mongolia, MASM	19-28
CGL 112	Tungsten-molybdenum ore	WMo	23	USZ 26.99	Mongolia, MASM	19-28
CGL 113	Iron ore	TTH	13	USZ 27.1999	Mongolia, MASM	19-28
CGL 114	Gold ore	B-7/1	2	USZ 29.2000	Mongolia, MASM	19-28
CGL 115	Gold ore	B-7/2	2	USZ 30.2000	Mongolia, MASM	19-28
CGL 116	Gold ore	B-7/3	2	USZ 31.2000	Mongolia, MASM	19-28
CGL 117	Epithermal gold ore	EAu-1	19	USZ 34.2002	Mongolia, MASM	19-28
CGL 118	Epithermal gold ore	EAu-2	2	USZ 35.2002	Mongolia, MASM	19-28
CGL 119	Chromium ore	HHH	18	USZ 36.2002	Mongolia, MASM	19-28
CGL 120	Gold-bearing complex ore	AHMH-1	20	USZ 38.2005	Mongolia, MASM	19-28

Table 1 (continued): **ORES**

CERTIFIED REFERENCE MATERIALS FROM MONGOLIA

CGL code	Description	Designation	Certified values (n)	Registration number	Certifying body	Page
CGL 121	Gold-bearing complex ore	AHMH-2	2	USZ 39.2005	Mongolia, MASM	19-28
CGL 122	Gold-bearing complex ore	AHMH-3	2	USZ 40.2005	Mongolia, MASM	19-28
CGL 123	Gold-copper ore	OTH	23	USZ 41.2006	Mongolia, MASM	19-28
CGL 124	Rare-earth ore	TRLK	37	USZ 42.2006	Mongolia, MASM	19-28
CGL 125	Mercury ore	Hg	18	USZ 43.2006	Mongolia, MASM	19-28
CGL 127	Manganese ore	MnH	13	USZ 61.2013	Mongolia, TC of CGL	19-28
CGL 128	Lithium ore	MLiH	18	USZ 66.2015	Mongolia, TC of CGL	19-28
CGL 129	Titanium ore	TiH	16	USZ 62.2013	Mongolia, TC of CGL	19-28
CGL 130	Fluorspar	M-HJ-55	3		Mongolia, STC of CGL	19-28
CGL 132	Fluorspar	M-HJ-90	2		Mongolia, STC of CGL	19-28
CGL 135	Fluorspar	M-HJ-35	4		Mongolia, STC of CGL	19-28

Table 1 (continued): **MINERAL PROCESSING PRODUCTS**

CERTIFIED REFERENCE MATERIALS FROM MONGOLIA

CGL code	Description	Designation	Certified values (n)	Registration number	Certifying body	Page
CGL 201	Tailings of copper-molybdenum ore floatation	CuMoH	4	USZ 4.85 GSO 3320-85 SO SEV 528-89	Mongolia, MASM, SSC of USSR, PCS of CMEA	29
CGL 207	Zinc concentrate	MZnB	17		Mongolia, STC of CGL	29

ENVIRONMENTAL MATERIALS

CGL code	Description	Designation	Certified values (n)	Registration number	Certifying body	Page
CGL 303	Mercury Soil	MS-1	1	USZ 55.2011	Mongolia, TC of CGL	30
CGL 304	Mercury Soil	MS-2	1	USZ 56.2011	Mongolia, TC of CGL	30
CGL 305	Mercury Soil	MS-3	1	USZ 57.2011	Mongolia, TC of CGL	30

COMBUSTION RAW MATERIALS

REFERENCE MATERIALS

CGL code	Description	Designation	Certified values (n)	Registration number	Certifying body	Page
CGL 401	Brown coal	BNN	6	USZ 58.2013	Mongolia, TC of CGL	30
CGL 402	Hard coal	SOEN	5	USZ 59.2013	Mongolia, TC of CGL	30
CGL 403	Coking coal	TTKN	5	USZ 60.2013	Mongolia, TC of CGL	30

Abbreviations:

MNCSM	Mongolian National Centre for Standardization and Metrology (former name)
MASM	Mongolian Agency for Standardization and Metrology
IAG	International Association of Geoanalyst
PCS of CMEA	Permanent Commission on Standards of Commision Mutual Economical Assistance (former name)
ASRIMRM	Allunion Scientific Research Institute for Metrology of Reference Materials (former name)
SSC of USSR	State Standards Committee of Union of Soviet Socialist Republics (former name)
USZ	State Standard
GSO	State Standard of USSR
TC of CGL	Technical Council of Central Geological Laboratory (former name)
STC of CGL	Scientific and Technical Council of Central Geological Laboratory

Table 2

CERTIFIED VALUES

Rocks

CGL code	Description	Designation	Certified value, % (m/m)											
			SiO_2	TiO_2	Al_2O_3	TFe_2O_3	Fe_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS	38.54			8.00			0.082	38.22				
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	71.72		16.12	0.50		0.299	0.149		0.388	5.34	3.58	0.0293
CGL 003	Graphite	BJBCh	52.20	0.57	9.33		3.48		0.03	1.94	7.05	0.47	2.54	
CGL 004	Graphite	ZBCh	52.84	0.49	8.46		3.61		0.07			0.51	2.09	
CGL 005	Magnesite	GM	0.25		0.04		0.05			45.80	1.69		0.011	
CGL 006	Nepheline syenite	LNS	51.88	0.37	22.58	2.63		0.80	0.14	0.24	2.28	6.78	9.10	0.04
CGL 007	Basalt	MBL-1	51.85	2.11	14.50	9.85		6.15	0.13	6.33	5.41	4.40	3.99	0.85
CGL 008	Granite	MGT-1	72.37	0.30	14.07	2.44		1.81	0.06	0.38	1.15	3.63	4.68	0.13
CGL 009	Andesite	MGL-AND	59.20	0.71	16.72	5.43			0.081	3.52	5.58	4.46	2.42	0.264
CGL 010	Zeolite, spiked	MGL-ZEO-S	67.64	0.158	12.98	1.27			0.033	0.573	1.34	3.44	3.19	0.032
CGL 011	Diorite	MDR	57.75	1.34	15.97	8.10		4.82	0.12	3.81	6.99	3.33	1.55	
CGL 012	Gabbro	MGR-T	48.00	0.37	26.26	4.22		2.00	0.08	2.85	13.61	2.42	0.31	0.078
CGL 013	Gabbro	MGR-N	43.15	0.94	22.57	10.99		4.57	0.10	4.51	14.99	1.41	0.11	
CGL 014	Basalt	MBL-D	48.34	2.68	13.03	12.66			0.15	8.03	8.88	3.63	1.72	0.70
CGL 015	Nepheline syenite	HNS	52.20	0.37	24.59	4.67		2.60		0.37	1.98	9.76	4.44	0.139
CGL 017	Natural Zeolite	M-ZEO-N	67.64	0.161	12.91	0.802			0.007	0.55	1.30	3.35	3.21	0.03

Table 2 (continued)

CERTIFIED VALUES

Rocks

CGL code	Description	Designation	Certified value, % (m/m)											
			SiO_2	TiO_2	Al_2O_3	TFe_2O_3	Fe_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5
IAG/CGL 018	Rhyolite	MRH-1	76.39	0.199	11.86	1.81			0.0713	0.094	0.048	3.73	5.17	0.010
IAG/CGL 019	Trachyandesite	MTA-1	58.64	1.395	16.0	5.91			0.0469	1.74	3.85	4.41	4.85	1.002
IAG/CGL 020	Limestone	ML-3	5.76	0.043	1.16	0.349			0.0231	1.385	50.32	0.228	0.229	0.0659
CGL 021	Dolomite	MDL	0.267		0.200	0.228			0.047	21.40	30.59		0.062	0.044
CGL 022	Greisen	MGn	80.93	0.086	10.26	3.25			0.102	0.044	0.836		1.47	0.018

Table 2 (continued)

CERTIFIED VALUES

Rocks

CGL code	Description	Designation	Certified value, % (m/m)					Certified value, mg/kg						
			F_{total}	LOI	H_2O^-	H_2O^+	CO_2	Ag	As	Au	Ba	Be	Bi	C
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS		13.33										
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	1.13	1.10	0.074									
CGL 003	Graphite	BJBCh		22.21			4.10							14.43%
CGL 004	Graphite	ZBCh		17.0			2.45							13.38%
CGL 005	Magnesite	GM		51.35			48.31							
CGL 006	Nepheline syenite	LNS		3.35					23.8		447			
CGL 007	Basalt	MBL-1									772	2.81		
CGL 008	Granite	MGT-1		0.64					2.28		350	8.63	1.03	
CGL 009	Andesite	MGL-AND		1.39							672			
CGL 010	Zeolite, spiked	MGL-ZEO-S		8.80					60.5		371			
CGL 011	Diorite	MDR		0.51		0.35					425			
CGL 012	Gabbro	MGR-T		1.40							119			
CGL 013	Gabbro	MGR-N									49.94			
CGL 014	Basalt	MBL-D									474			
CGL 015	Nepheline syenite	HNS		1.05							1305			
CGL 017	Natural Zeolite	M-ZEO-N		9.77							383			

Table 2 (continued)

CERTIFIED VALUES

Rocks

CGL code	Description	Designation	Certified value, % (m/m)					Certified value, mg/kg						
			F_{total}	LOI	H_2O^-	H_2O^+	CO_2	Ag	As	Au	Ba	Be	Bi	C
IAG/CGL 018	Rhyolite	MRH-1							3.9		3.6	7.1		
IAG/CGL 019	Trachyandesite	MTA-1							6.5		2828	2.22		
IAG/CGL 020	Limestone	ML-3		40.29							51	0.58		
CGL 022	Greisen	MGn		1.46					63.6					

Table 2 (continued)

CERTIFIED VALUES

Rocks

CGL code	Description	Designation	Certified value, mg/kg											
			Cd	Ce	Co	Cr	Cs	Cu	Dy	Er	Eu	Ga	Gd	Ge
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS			106	2780								
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO		27.4				7.1						
CGL 006	Nepheline syenite	LNS		308		44						23		
CGL 007	Basalt	MBL-1		103	36.3	222	1.15	32.21	4.67	1.84	2.62	22.63	7.17	1.29
CGL 008	Granite	MGT-1		64.38	2.71	182	17.02	7.36	4.42	2.37	0.58	22.80	4.95	1.50
CGL 009	Andesite	MGL-AND		55.2	19.2	95.9	1.09	41.2			1.44	21.1		
CGL 010	Zeolite, spiked	MGL-ZEO-S		74.8	20.3	12.7	4.73	79.3				13.8		
CGL 011	Diorite	MDR		50.8	84.9	100		100				19.58		
CGL 012	Gabbro	MGR-T		7.90	14.93	69.97		45.32				18.87		
CGL 013	Gabbro	MGR-N			35.21	35.72		608				17.94		
CGL 014	Basalt	MBL-D		67.51	46.50	188		64.0				21.20		
CGL 015	Nepheline syenite	HNS		58.24		25.6		6.40				22.63		
CGL 017	Natural Zeolite	M-ZEO-N										14.84		
IAG/CGL 018	Rhyolite	MRH-1		127		41	4.3		9.1	4.4	0.471	24.6	11.4	
IAG/CGL 019	Trachyandesite	MTA-1		219	13.4	35	11.7	21.60	4.03	1.62	3.36	21.7		
IAG/CGL 020	Limestone	ML-3		6.08	1.1	5.3	2.01	1.3	0.528	0.298	0.143	1.48	0.611	
CGL 022	Greisen	MGn				271		563				26.1		

Table 2 (continued)

CERTIFIED VALUES

Rocks

CGL code	Description	Designation	Certified value, mg/kg											
			Hf	**Hg**	**Ho**	**La**	**Li**	**Lu**	**Mo**	**Nb**	**Nd**	**Ni**	**Pb**	**Pr**
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS										2300		
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO				8.4	1730	0.326		64	15.5	10.7	63	
CGL 003	Graphite	BJBCh										70		
CGL 006	Nepheline syenite	LNS				163	54			40			114	
CGL 007	Basalt	MBL-1	6.63		0.78	55.99	11.08	0.19	5.20	52.21	46.62	162	8.70	11.9
CGL 008	Granite	MGT-1	4.75		0.85	29.59	124	0.35	3.06	15.22	27.10	5.76	24.81	7.27
CGL 009	Andesite	MGL-AND	3.80			26.2				3.23	27.2	61.2	18.7	
CGL 010	Zeolite, spiked	MGL-ZEO-S				37.2				14.1	27.3	14.6	84.2	
CGL 011	Diorite	MDR				24.40				6.92	30.48	40.94	8.97	
CGL 012	Gabbro	MGR-T										23.94	6.00	
CGL 013	Gabbro	MGR-N										23.34	4.68	
CGL 014	Basalt	MBL-D				35.11				56.50	36.33	163	5.66	
CGL 015	Nepheline syenite	HNS				27.48	64.95			22.63	27.34		7.00	
CGL 017	Natural Zeolite	M-ZEO-N								14.17			21.78	
IAG/CGL 018	Rhyolite	MRH-1	14.6		1.62	68	47	0.58		75	67.5		47	18.5
IAG/CGL 019	Trachyandesite	MTA-1	8.3		0.658	112	22.7	0.179		14.8	90.7	27	34.1	25.3
IAG/CGL 020	Limestone	ML-3	0.395		0.103	3.71	9.7	0.0412		0.80	3.32	5	2.9	0.85
CGL 022	Greisen	MGn								28.4				

Table 2 (continued)

CERTIFIED VALUES

Rocks

CGL code	Description	Designation	Certified value, mg/kg											
			Rb	**Re**	**Sb**	**Sc**	**Se**	**Sm**	**Sn**	**Sr**	**Ta**	**Tb**	**Te**	**Th**
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS								7.3				
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	2360			9.2		6.0		12.3	46.7			13.3
CGL 003	Graphite	BJBCh	140											
CGL 006	Nepheline syenite	LNS	207							1740				61.6
CGL 007	Basalt	MBL-1	63.05		0.28	10.1		8.72	2.66	927	3.20	0.95		6.95
CGL 008	Granite	MGT-1	275		0.19	4.36		5.54	13.30	111	2.56	0.79		19.35
CGL 009	Andesite	MGL-AND	49.7			11.8		5.16		1116		0.49		6.46
CGL 010	Zeolite, spiked	MGL-ZEO-S	106			3.27				635				17.2
CGL 011	Diorite	MDR	48.5			20.46				454				3.88
CGL 012	Gabbro	MGR-T	6.58			12.33				1196				
CGL 013	Gabbro	MGR-N				39.66				778				
CGL 014	Basalt	MBL-D	28.60			19.33				741				
CGL 015	Nepheline syenite	HNS	85.36			2.76				312				
CGL 017	Natural Zeolite	M-ZEO-N	107							651				
IAG/CGL 018	Rhyolite	MRH-1	274			2.3		14.8	6.2	4.5	4.2	1.70		28.9
IAG/CGL 019	Trachyandesite	MTA-1	104		8.5	8.6		13.2	1.8	2692	0.74	0.871		11.4
IAG/CGL 020	Limestone	ML-3	11.5			0.71		0.638	0.66	1018	0.093	0.092		0.71
CGL 022	Greisen	MGn	463						1884	16.6				32.9

Table 2 (continued)

CERTIFIED VALUES

Rocks

CGL code	Description	Designation	Certified value, mg/kg									
			ΣTR_2O_3	Tl	Tm	U	V	W	Y	Yb	Zn	Zr
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS				0.80	33.4				39	
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO								2.38	92	40.1
CGL 003	Graphite	BJBCh									180	120
CGL 006	Nepheline syenite	LNS				12.4	30		23		98	600
CGL 007	Basalt	MBL-1		0.12	0.23	1.64	105	1.15	20.48	1.34	114	287
CGL 008	Granite	MGT-1		1.72	0.37	5.44	14.03	0.56	25.19	2.36	54.59	169
CGL 009	Andesite	MGL-AND				1.96	123		11.8	1.00	71.5	141
CGL 010	Zeolite, spiked	MGL-ZEO-S				3.09	42.3		18.6		79.3	177
CGL 011	Diorite	MDR					213	266	23.62	2.05	92.77	191
CGL 012	Gabbro	MGR-T					85.28		5.14		59.87	
CGL 013	Gabbro	MGR-N					420		4.30		98.0	
CGL 014	Basalt	MBL-D					197		23.60		133	201
CGL 015	Nepheline syenite	HNS							25.32	2.66	75.42	157
CGL 017	Natural Zeolite	M-ZEO-N							20.36		25.37	
IAG/CGL 018	Rhyolite	MRH-1			0.629	3.2	3.4		44.7	4.00	161	471
IAG/CGL 019	Trachyandesite	MTA-1			0.207	1.72	102		17.7	1.231	89	368
IAG/CGL 020	Limestone	ML-3			0.0437	1.08	5.9	0.80	3.43	0.276	8	
CGL 022	Greisen	MGn							94.6		273	148

Table 2 (continued)

CERTIFIED VALUES

Ores

CGL code	Designation	Description	Certified value, % (m/m)											
			SiO_2	TiO_2	Al_2O_3	TFe_2O_3	Fe_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5
CGL 101	HJ	Fluorspar	23.01	0.047	2.35	0.34					[1]37.32		0.99	
CGL 102	HF	Phosphorite	28.04			0.37				8.30	33.80	0.12	0.077	13.81
CGL 105	RS-2	Silver ore	17.80	0.12	2.11	48.40			2.77	1.48	0.25		0.53	0.54
CGL 107	BF	Phosphorite	20.57		0.85	0.63				2.265	38.85		0.092	26.38
CGL 108	TsAg	Silver -bearing complex ore	42.08	0.30	5.82	7.425				0.45	3.87		1.56	0.12
CGL 109	ZB-1	Gold-quartz ore	92.57	0.08	1.70		1.92		0.025		0.77	0.07	0.37	0.037
CGL 111	TRM-2	Rare-earth ore	14.86	0.15	2.47		13.45	0.14	0.14	0.50	25.51	0.92	0.91	19.26
CGL 112	WMo	Tungsten-molybdenum ore	64.87	0.82	14.14	5.59		3.72	0.12	2.04	1.95	2.13	4.32	
CGL 113	TTH	Iron ore	3.37	0.101	1.37	[1]62.20		21.06	0.105	2.78	0.56		0.07	

[1]certified value by element

Table 2 (continued)

CERTIFIED VALUES

Ores

CGL code	Designation	Description	Certified value, % (m/m)					Certified value, mg/kg						
			F_{total}	SO_3	LOI	H_2O^-	CO_2	Ag	As	Au	Ba	Be	Bi	C
CGL 101	HJ	Fluorspar	34.92											
CGL 104	RS-1	Silver ore						169						
CGL 105	RS-2	Silver ore		6.85				331	5300				1100	
CGL 106	RS-3	Silver ore						740						
CGL 107	BF	Phosphorite			6.43		5.84							
CGL 108	TsAg	Silver -bearing complex ore		21.25				347.92						
CGL 109	ZB-1	Gold-quartz ore			0.95			3.05		10.05				
CGL 110	ZB-2	Gold ore								1.05				
CGL 111	TRM-2	Rare-earth ore		4.58	6.78		1.04		155.83		917			
CGL 112	WMo	Tungsten-molybdenum ore							900				67	
CGL 113	TTH	Iron ore		7.14										
CGL 114	B-7/1	Gold ore						6.05		42.26				
CGL 115	B-7/2	Gold ore						1.18		5.92				
CGL 116	B-7/3	Gold ore						1.07		3.28				

Table 2 (continued)

CERTIFIED VALUES

Ores

CGL code	Designation	Description	Certified value, mg/kg											
			Cd	Ce	Co	Cr	Cs	Cu	Dy	Er	Eu	Ga	Gd	Ge
CGL 104	RS-1	Silver ore	0.0015%					4600						
CGL 105	RS-2	Silver ore	0.0020%					8300						
CGL 106	RS-3	Silver ore						2.25%						
CGL 108	TsAg	Silver-bearing complex ore						4400						
CGL 111	TRM-2	Rare-earth ore		2.90%	32.46			128	206	79.5	211.6		553	
CGL 112	WMo	Tungsten-molybdenum ore			11			220						
CGL 113	TTH	Iron ore			0.013%			300						

Ores

CGL code	Designation	Description	Certified value, mg/kg											
			Hf	Hg	Ho	La	Li	Lu	Mo	Nb	Nd	Ni	Pb	Pr
CGL 104	RS-1	Silver ore											1000	
CGL 105	RS-2	Silver ore											1300	
CGL 106	RS-3	Silver ore											410	
CGL 108	TsAg	Silver-bearing complex ore											10%	
CGL 111	TRM-2	Rare-earth ore			36.6	1.93%		7.64			8800	70.8	1100	2800
CGL 112	WMo	Tungsten-molybdenum ore							790			35	76	
CGL 113	TTH	Iron ore										80		

Table 2 (continued)

CERTIFIED VALUES

Ores

CGL code	Designation	Description	Certified value, mg/kg											
			Rb	**Re**	**Sb**	**Sc**	**Se**	**Sm**	**Sn**	**Sr**	**Ta**	**Tb**	**Te**	**Th**
CGL 105	RS-2	Silver ore			5000									
CGL 111	TRM-2	Rare-earth ore	43					900		2.24%		54.6		217.58
CGL 112	WMo	Tungsten-molybdenum ore	1060							78				

Ores

CGL code	Designation	Description	Certified value, mg/kg										
			ΣTR_2O_3	**Tl**	**Tm**	**U**	**V**	**W**	**Y**	**Yb**	**Zn**	**Zr**
CGL 104	RS-1	Silver ore									4200	
CGL 105	RS-2	Silver ore									5900	
CGL 106	RS-3	Silver ore									2000	
CGL 108	TsAg	Silver-bearing complex ore									8.72%	
CGL 111	TRM-2	Rare-earth ore	7.56%				138.6		959	54.52	600	
CGL 112	WMo	Tungsten-molybdenum ore					100	[2]4100			170	170

[2]certified value by oxide (WO_3)

Table 2 (continued)

CERTIFIED VALUES

Ores

CGL code	Designation	Description	Certified value, % (m/m)											
			SiO_2	TiO_2	Al_2O_3	TFe_2O_3	Fe_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5
CGL 117	EAu-1	Epithermal gold ore	84.70	0.17	4.79	2.18			0.017	0.37	2.53	0.055	1.48	0.125
CGL 119	HHH	Chromium ore	4.73	0.11	8.24	14.73			0.15	16.09	0.24			0.02
CGL 120	AHMH-1	Gold-bearing complex ore	77.37	0.15	2.03		14.71		0.03	1.01	0.56	0.17	0.64	0.05
CGL 123	OTH	Gold-copper ore	52.09	0.93	14.58				0.12	5.52	3.14	2.36	2.81	0.27
CGL 124	TRLK	Rare-earth ore	11.86	0.20	2.72	5.71			1.67	2.78	32.68	0.25	1.55	0.22
CGL 125	Hg	Mercury ore	41.01	0.018	0.53		4.66	0.49	0.29	9.93	17.39	0.07	0.03	
CGL 127	MnH	Manganese ore	10.84	0.53	9.27	19.51			45.9	0.79				0.76
CGL 128	MLiH	Lithium ore	73.40		13.66	0.663			0.603	0.033	0.746		6.28	
CGL 129	TiH	Titanium ore	7.77	14.88	9.79	61.86			0.24	3.05	1.16		0.137	0.022
CGL 130	M-HJ-55	Fluorspar	43.44											[1]0.028
CGL 132	M-HJ-90	Fluorspar	10.15											
CGL 135	M-HJ-35	Fluorspar	47.67											[1]0.037

[1]certified value by element

Table 2 (continued)

CERTIFIED VALUES

Ores

CGL code	Designation	Description	Certified value, % (m/m)						Certified value, mg/kg					
			F_{total}	SO_3	LOI	H_2O^-	CO_2	CaF_2	Ag	As	Au	Ba	Be	Bi
CGL 117	EAu-1	Epithermal gold ore			2.84	0.10			1.70	0.12%	0.79			
CGL 118	EAu-2	Epithermal gold ore							1.25		0.57			
CGL 119	HHH	Chromium ore		0.07	1.07	0.11	0.47				0.03			
CGL 120	AHMH-1	Gold-bearing complex ore			2.59						31.28	200		
CGL 121	AHMH-2	Gold-bearing complex ore							49.33		10.92			
CGL 122	AHMH-3	Gold-bearing complex ore							27.06		7.38			
CGL 123	OTH	Gold-copper ore		3.87	5.43						0.91	249		
CGL 124	TRLK	Rare-earth ore			30.56		29.0			224		307		
CGL 125	Hg	Mercury ore			25.28									
CGL 128	MLiH	Lithium ore								61.75		83.51		185
CGL 130	M-HJ-55	Fluorspar						53.49						
CGL 132	M-HJ-90	Fluorspar						88.65						
CGL 135	M-HJ-35	Fluorspar		[1]0.41				35.60						

[1]certified value by element

Table 2 (continued)

CERTIFIED VALUES

Ores

CGL code	Designation	Description	Certified value, mg/kg											
			Cd	Ce	Co	Cr	Cs	Cu	Dy	Er	Eu	Ga	Gd	Ge
CGL 117	EAu-1	Epithermal gold ore						14.84						
CGL 119	HHH	Chromium ore			100	[2]54.37%								
CGL 120	AHMH-1	Gold-bearing complex ore						4300						
CGL 123	OTH	Gold-copper ore			24.3	99.3		7500						
CGL 124	TRLK	Rare-earth ore		2.76%	7.89			27.37	57.63		87.22			
CGL 125	Hg	Mercury ore			47	2100		7.7						
CGL 127	MnH	Manganese ore			316									
CGL 128	MLiH	Lithium ore						186						
CGL 129	TiH	Titanium ore			209	3068								

[2]certified value by oxide

Table 2 (continued)

CERTIFIED VALUES

Ores

CGL code	Designation	Description	Certified value, mg/kg											
			Hf	**Hg**	**Ho**	**La**	**Li**	**Lu**	**Mo**	**Nb**	**Nd**	**Ni**	**Pb**	**Pr**
CGL 117	EAu-1	Epithermal gold ore											20	
CGL 119	HHH	Chromium ore										900		
CGL 120	AHMH-1	Gold-bearing complex ore							1100			28.27		
CGL 123	OTH	Gold-copper ore							51.8			25.4	27	
CGL 124	TRLK	Rare-earth ore			7.86	21100	21.78		34.40	31	6500	13.18	1600	2300
CGL 125	Hg	Mercury ore		689								1000		
CGL 127	MnH	Manganese ore										377		
CGL 128	MLiH	Lithium ore					[2]0.578%						558	
CGL 129	TiH	Titanium ore										306		

[2]certified value by oxide

Table 2 (continued)

CERTIFIED VALUES

Ores

CGL code	Designation	Description	Certified value, mg/kg											
			Rb	Re	Sb	Sc	Se	Sm	Sn	Sr	Ta	Tb	Te	Th
CGL 117	EAu-1	Epithermal gold ore			1400									
CGL 120	AHMH-1	Gold-bearing complex ore								88.71				
CGL 123	OTH	Gold-copper ore								259				
CGL 124	TRLK	Rare-earth ore	67.12					539		4900				946
CGL 125	Hg	Mercury ore								382				
CGL 127	MnH	Manganese ore								1354				
CGL 128	MLiH	Lithium ore								24.54				
CGL 129	TiH	Titanium ore								152				

Table 2 (continued)

CERTIFIED VALUES

Ores

CGL code	Designation	Description	Certified value, mg/kg									
			ΣTR_2O_3	Tl	Tm	U	V	W	Y	Yb	Zn	Zr
CGL 117	EAu-1	Epithermal gold ore									25	
CGL 119	HHH	Chromium ore					400				230	
CGL 120	AHMH-1	Gold-bearing complex ore					39.33	100			65.29	
CGL 123	OTH	Gold-copper ore					335				136	78.3
CGL 124	TRLK	Rare-earth ore	82700				115		167	17.85	469	
CGL 125	Hg	Mercury ore					38					
CGL 127	MnH	Manganese ore							104		182	208
CGL 128	MLiH	Lithium ore				45.28		107			594	69.94
CGL 129	TiH	Titanium ore					2818				575	35

Table 2 (continued)

CERTIFIED VALUES

Mineral processing products

CGL code	Designation	Description	Certified value, % (m/m)					Certified value, mg/kg		
			Al_2O_3	TFe_2O_3	MnO	CaO	SO_3	Ag	As	Bi
CGL 201	CuMoH	Tailings of copper-molybdenum ore floatation		3.90			[1]2.03			
CGL 207	MZnB	Zinc concentrate	0.112	10.45	6.20	0.85	[1]31.12	33.43	167.7	309.6

[1]certified value by element

Mineral processing products

CGL code	Designation	Description	Certified value, mg/kg								
			Cd	Co	Cu	Mo	Ni	Pb	U	In	Zn
CGL 201	CuMoH	Tailings of copper-molybdenum ore floatation			0.115%	0.007%					
CGL 207	MZnB	Zinc concentrate	910.5	424.4	1940	255.6	11.18	3407	7.86	152.9	49.14%

Table 2 (continued)

CERTIFIED VALUES

Environmental materials

CGL code	Designation	Description	Certified value, mg/kg
			Hg
CGL 303	MS-1	Mercury Soil	0.157
CGL 304	MS-2	Mercury Soil	1.52
CGL 305	MS-3	Mercury Soil	2.75

Combustion raw materials

CGL code	Designation	Description	Property value, % (m/m)					
			A^d	V^{daf}	Q^{daf}, MJ/kg	S^d_{total}	C^{daf}	H^{daf}
CGL 401	Brown coal	BNN	9.04	46.28	28.95	0.54	70.49	5.27
CGL 402	Hard coal	SOEN	6.27	44.82	32.16	0.78	76.62	
CGL 403	Coking coal	TTKN	15.17	29.29	35.26	1.21		4.88

A^d - Ash content, dry basis analysis
V^{daf} - Volatile matter, dry ash-free basis analysis
Q^{daf} - Calorific value, dry ash-free basis analysis
S^d_{total} - Total Sulphur, dry basis analysis
C^{daf} - Carbon content, dry ash-free basis analysis
H^{daf} - Hydrogen content, dry ash-free basis analysis

CERTIFIED VALUES BY ELEMENT AND COMPONENT

Table 3

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Ag	**Silver**			
CGL 116	Gold ore	B-7/3	1.07	0.20
CGL 115	Gold ore	B-7/2	1.18	0.17
CGL 118	Epithermal gold ore	EAu-2	1.25	0.16
CGL 117	Epithermal gold ore	EAu-1	1.70	0.42
CGL 109	Gold-quartz ore	ZB-1	3.05	0.29
CGL 114	Gold ore	B-7/1	6.05	0.44
CGL 122	Gold-bearing complex ore	AHMH-3	27.06	1.99
CGL 207	Zinc concentrate	MZnB	33.43	4.10*
CGL 121	Gold-bearing complex ore	AHMH-2	49.33	4.29
CGL 104	Silver ore	RS-1	169	5
CGL 105	Silver ore	RS-2	331	12
CGL 108	Silver-bearing complex ore	TsAg	347.92	5.25
CGL 106	Silver ore	RS-3	740	23

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, %	Confidence interval, %
Al_2O_3	**Aluminium oxide**			
CGL 005	Magnesite	GM	0.04	0.01
CGL 207	Zinc concentrate	MZnB	0.112	0.042*
CGL 021	Dolomite	MDL	0.200	0.021*
CGL 125	Mercury ore	Hg	0.53	0.13
CGL 107	Phosphorite	BF	0.85	0.09
IAG/CGL 020	Limestone	ML-3	1.16	0.02*
CGL 113	Iron ore	TTH	1.37	0.13
CGL 109	Gold-quartz ore	ZB-1	1.70	0.13
CGL 120	Gold-bearing complex ore	AHMH-1	2.03	0.09
CGL 105	Silver ore	RS-2	2.11	0.07
CGL 101	Fluorspar	HJ	2.35	0.05
CGL 111	Rare-earth ore	TRM-2	2.47	0.10
CGL 124	Rare-earth ore	TRLK	2.72	0.13
CGL 117	Epithermal gold ore	EAu-1	4.79	0.10
CGL 108	Silver-bearing complex ore	TsAg	5.82	0.22
CGL 119	Chromium ore	HHH	8.24	0.52
CGL 004	Graphite	ZBCh	8.46	0.08
CGL 127	Manganese ore	MnH	9.27	0.16*
CGL 003	Graphite	BJBCh	9.33	0.18
CGL 129	Titanium ore	TiH	9.79	0.09*
CGL 022	Greisen	MGn	10.26	0.66*
IAG/CGL 018	Rhyolite	MRH-1	11.86	0.06*
CGL 017	Natural Zeolite	M-ZEO-N	12.91	0.64*
CGL 010	Zeolite, spiked	MGL-ZEO-S	12.98	0.13*
CGL 014	Basalt	MBL-D	13.03	0.11
CGL 128	Lithium ore	MLiH	13.66	0.24*
CGL 008	Granite	MGT-1	14.07	0.13
CGL 112	Tungsten-molybdenum ore	WMo	14.14	0.43
CGL 007	Basalt	MBL-1	14.50	0.15
CGL 123	Gold-copper ore	OTH	14.58	0.16
CGL 011	Diorite	MDR	15.97	0.13
IAG/CGL 019	Trachyandesite	MTA-1	16.0	0.7*
CGL 002	Alkaline granite	IAG CRM-3	16.12	0.12*
CGL 009	Andesite	MGL-OShBO MGL-AND	16.72	0.24*
CGL 013	Gabbro	MGR-N	22.57	0.28
CGL 006	Nepheline syenite	LNS	22.58	0.13
CGL 015	Nepheline syenite	HNS	24.59	0.21
CGL 012	Gabbro	MGR-T	26.26	0.31

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
As	**Arsenic**			
CGL 008	Granite	MGT-1	2.28	0.24
IAG/CGL 018	Rhyolite	MRH-1	3.9	0.7*
IAG/CGL 019	Trachyandesite	MTA-1	6.5	0.8*
CGL 006	Nepheline syenite	LNS	23.8	2.88
CGL 010	Zeolite, spiked	MGL-ZEO-S	60.5	12.3*
CGL 128	Lithium ore	MLiH	61.75	9.37*
CGL 022	Greisen	MGn	63.6	3.3*
CGL 111	Rare-earth ore	TRM-2	155.83	26.58
CGL 207	Zinc concentrate	MZnB	167.7	14.4*
CGL 124	Rare-earth ore	TRLK	224	24
CGL 112	Tungsten-molybdenum ore	WMo	0.09%	0.01%
CGL 117	Epithermal gold ore	EAu-1	0.12%	0.02%
CGL 105	Silver ore	RS-2	0.53%	0.03%
Au	**Gold**			
CGL 119	Chromium ore	HHH	0.03	0.02
CGL 118	Epithermal gold ore	EAu-2	0.57	0.04
CGL 117	Epithermal gold ore	EAu-1	0.79	0.02
CGL 123	Gold-copper ore	OTH	0.91	0.09
CGL 110	Gold ore	ZB-2	1.05	0.16
CGL 116	Gold ore	B-7/3	3.28	0.19
CGL 115	Gold ore	B-7/2	5.92	0.21
CGL 122	Gold-bearing complex ore	AHMH-3	7.38	0.30
CGL 109	Gold-quartz ore	ZB-1	10.05	0.81
CGL 121	Gold-bearing complex ore	AHMH-2	10.92	0.45
CGL 120	Gold-bearing complex ore	AHMH-1	31.28	1.30
CGL 114	Gold ore	B-7/1	42.26	2.49

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Ba	**Barium**			
IAG/CGL 018	Rhyolite	MRH-1	3.6	0.6*
CGL 013	Gabbro	MGR-N	49.94	2.72
IAG/CGL 020	Limestone	ML-3	51	2*
CGL 128	Lithium ore	MLiH	83.51	5.44*
CGL 012	Gabbro	MGR-T	119	3.3
CGL 120	Gold-bearing complex ore	AHMH-1	0.02%	0.002%
CGL 123	Gold-copper ore	OTH	249	15
CGL 124	Rare-earth ore	TRLK	307	10
CGL 008	Granite	MGT-1	350	7
CGL 010	Zeolite, spiked	MGL-ZEO-S	371	9*
CGL 017	Natural Zeolite	M-ZEO-N	383	21*
CGL 011	Diorite	MDR	425	23
CGL 006	Nepheline syenite	LNS	447	44
CGL 014	Basalt	MBL-D	474	77
CGL 009	Andesite	MGL-AND	672	12*
CGL 007	Basalt	MBL-1	772	12
CGL 111	Rare-earth ore	TRM-2	917	58
CGL 015	Nepheline syenite	HNS	1305	53
IAG/CGL 019	Trachyandesite	MTA-1	2828	53*
Be	**Beryllium**			
IAG/CGL 020	Limestone	ML-3	0.58	0.06*
IAG/CGL 019	Trachyandesite	MTA-1	2.22	0.11*
CGL 007	Basalt	MBL-1	2.81	0.16
IAG/CGL 018	Rhyolite	MRH-1	7.1	0.4*
CGL 008	Granite	MGT-1	8.63	0.54

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Bi	**Bismuth**			
CGL 008	Granite	MGT-1	1.03	0.05
CGL 112	Tungsten-molybdenum ore	WMo	67	14
CGL 128	Lithium ore	MLiH	185	10*
CGL 207	Zinc concentrate	MZnB	309.6	15.7*
CGL 105	Silver ore	RS-2	0.11%	0.01%

CGL code	Description	Designation	Certified value, %	Confidence interval, %
C	**Carbon**			
CGL 004	Graphite	ZBCh	13.38	0.67
CGL 003	Graphite	BJBCh	14.43	0.64
C^{daf}	**Carbon** (dry ash free)			
CGL 401	Brown coal	BNN	70.49	3.66
CGL 402	Hard coal	SOEN	76.62	3.35
CaF_2	**Calcium fluoride**			
CGL 135	Fluorspar	M-HJ-35	35.6	0.55 *
CGL 130	Fluorspar	M-HJ-55	53.49	0.72 *
CGL 132	Fluorspar	M-HJ-90	88.65	1.62 *

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, %	Confidence interval, %
CaO	**Calcium oxide**			
IAG/CGL 018	Rhyolite	MRH-1	0.048	0.004*
CGL 119	Chromium ore	HHH	0.24	0.04
CGL 105	Silver ore	RS-2	0.25	0.03
CGL 002	Alkaline granite	IAG CRM-3	0.388	0.011*
CGL 113	Iron ore	MGL-OShBO TTH	0.56	0.05
CGL 120	Gold-bearing complex ore	AHMH-1	0.56	0.06
CGL 128	Lithium ore	MLiH	0.746	0.022*
CGL 109	Gold-quartz ore	ZB-1	0.77	0.06
CGL 022	Greisen	MGn	0.836	0.032*
CGL 207	Zinc concentrate	MZnB	0.85	0.033*
CGL 008	Granite	MGT-1	1.15	0.02
CGL 129	Titanium ore	TiH	1.16	0.03*
CGL 017	Natural Zeolite	M-ZEO-N	1.30	0.08*
CGL 010	Zeolite, spiked	MGL-ZEO-S	1.34	0.01*
CGL 005	Magnesite	GM	1.69	0.11
CGL 112	Tungsten-molybdenum ore	WMo	1.95	0.08
CGL 015	Nepheline syenite	HNS	1.98	0.06
CGL 006	Nepheline syenite	LNS	2.28	0.21
CGL 117	Epithermal gold ore	EAu-1	2.53	0.14
CGL 123	Gold-copper ore	OTH	3.14	0.05
IAG/CGL 019	Trachyandesite	MTA-1	3.85	0.03*
CGL 108	Silver-bearing complex ore	TsAg	3.87	0.15
CGL 007	Basalt	MBL-1	5.41	0.18
CGL 009	Andesite	MGL-AND	5.58	0.15*
CGL 011	Diorite	MDR	6.99	0.13
CGL 003	Graphite	BJBCh	7.05	0.24
CGL 014	Basalt	MBL-D	8.88	0.31
CGL 012	Gabbro	MGR-T	13.61	0.23
CGL 013	Gabbro	MGR-N	14.99	0.25
CGL 125	Mercury ore	Hg	17.39	0.15
CGL 111	Rare-earth ore	TRM-2	25.51	0.50
CGL 021	Dolomite	MDL	30.59	0.25*
CGL 124	Rare-earth ore	TRLK	32.68	0.40
CGL 102	Phosphorite	HF	33.80	0.16
CGL 107	Phosphorite	BF	38.85	0.68
IAG/CGL 020	Limestone	ML-3	50.32	0.25*
CGL 101	Fluorspar	HJ	[1]37.32	[1]0.19

[1]certified value by element ; *-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Cd	**Cadmium**			
CGL 104	Silver ore	RS-1	15	1
CGL 105	Silver ore	RS-2	20	1
CGL 207	Zinc concentrate	MZnB	910.5	127.6*
Ce	**Cerium**			
IAG/CGL 020	Limestone	ML-3	6.08	0.14*
CGL 012	Gabbro	MGR-T	7.90	1.11
CGL 002	Alkaline granite	IAG CRM-2 MGL-OShBO	27.4	1.6*
CGL 011	Diorite	MDR	50.8	2.58
CGL 009	Andesite	MGL-AND	55.2	2.0*
CGL 015	Nepheline syenite	HNS	58.24	5.77
CGL 008	Granite	MGT-1	64.38	1.36
CGL 014	Basalt	MBL-D	67.51	3.07
CGL 010	Zeolite, spiked	MGL-ZEO-S	74.8	3.0*
CGL 007	Basalt	MBL-1	103	2
IAG/CGL 018	Rhyolite	MRH-1	127	2*
IAG/CGL 019	Trachyandesite	MTA-1	219	7*
CGL 006	Nepheline syenite	LNS	308	15
CGL 124	Rare-earth ore	TRLK	2.76%	0.05%
CGL 111	Rare-earth ore	TRM-2	2.90%	0.12%

CGL code	Description	Designation	Certified value, %	Confidence interval, %
CO_2	**Carbon dioxide**			
CGL 119	Chromium ore	HHH	0.47	0.07
CGL 111	Rare-earth ore	TRM-2	1.04	0.07
CGL 004	Graphite	ZBCh	2.45	0.04
CGL 003	Graphite	BJBCh	4.10	0.21
CGL 107	Phosphorite	BF	5.84	0.13
CGL 124	Rare-earth ore	TRLK	29.00	0.33
CGL 005	Magnesite	GM	48.31	0.28

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Co	**Cobalt**			
CGL 020	Limestone	ML-3	1.1	0.2*
CGL 008	Granite	MGT-1	2.71	0.10
CGL 124	Rare-earth ore	TRLK	7.89	0.81
CGL 112	Tungsten-molybdenum ore	WMo	11	3
IAG/CGL 019	Trachyandesite	MTA-1	13.4	0.4*
CGL 012	Gabbro	MGR-T	14.93	8.0
CGL 009	Andesite	MGL-AND	19.2	0.8*
CGL 010	Zeolite, spiked	MGL-ZEO-S	20.3	2.8*
CGL 123	Gold-copper ore	OTH	24.3	2.3
CGL 111	Rare-earth ore	TRM-2	32.46	6.03
CGL 013	Gabbro	MGR-N	35.21	6.22
CGL 007	Basalt	MBL-1	36.3	2.3
CGL 014	Basalt	MBL-D	46.50	5.65
CGL 125	Mercury ore	Hg	47	3.04
CGL 011	Diorite	MDR	84.9	12.5
CGL 119	Chromium ore	HHH	100	50
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS	106	3*
CGL 113	Iron ore	TTH	130	10
CGL 129	Titanium ore	TiH	209	16*
CGL 127	Manganese ore	MnH	316	25*
CGL 207	Zinc concentrate	MZnB	424.4	21.6*

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Cr	**Chromium**			
IAG/CGL 020	Limestone	ML-3	5.3	0.6*
CGL 010	Zeolite, spiked	MGL-ZEO-S	12.7	6.7*
CGL 015	Nepheline syenite	HNS	25.6	1.69
CGL 019	Trachyandesite	MTA-1	35	2*
CGL 013	Gabbro	MGR-N	35.72	3.36
IAG/CGL 018	Rhyolite	MRH-1	41	2
CGL 006	Nepheline syenite	LNS	44	7
CGL 012	Gabbro	MGR-T	69.97	6.71
CGL 009	Andesite	MGL-AND	95.9	4.8*
CGL 123	Gold-copper ore	OTH	99.3	3.4
CGL 011	Diorite	MDR	100	17
CGL 008	Granite	MGT-1	182	7
CGL 014	Basalt	MBL-D	188	15
CGL 007	Basalt	MBL-1	222	12.11
CGL 022	Greisen	MGn	271	17*
CGL 125	Mercury ore	Hg	0.21%	0.01%
CGL 001	Serpentinite	IAG CRM-2	2780	30*
CGL 129	Titanium ore	MGL-GAS TiH	3068	177*
CGL 119	Chromium ore	HHH	[2]54.37%	[2]0.42%

[2]certified value by oxide (Cr_2O_3);
*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Cs	**Cesium**			
CGL 009	Andesite	MGL-AND	1.09	0.20*
CGL 007	Basalt	MBL-1	1.15	0.03
IAG/CGL 020	Limestone	ML-3	2.01	0.08*
IAG/CGL 018	Rhyolite	MRH-1	4.3	0.2*
CGL 010	Zeolite, spiked	MGL-ZEO-S	4.73	0.41*
IAG/CGL 019	Trachyandesite	MTA-1	11.7	0.5*
CGL 008	Granite	MGT-1	17.02	0.49
Cu	**Copper**			
IAG/CGL 020	Limestone	ML-3	1.3	0.7*
CGL 015	Nepheline syenite	HNS	6.40	0.44
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	7.1	1.1*
CGL 008	Granite	MGT-1	7.36	0.34
CGL 125	Mercury ore	Hg	7.7	1.8
CGL 117	Epithermal gold ore	EAu-1	14.84	3.86
IAG/CGL 019	Trachyandesite	MTA-1	21.6	1.1*
CGL 124	Rare-earth ore	TRLK	27.37	6.43
CGL 007	Basalt	MBL-1	32.21	1.33
CGL 009	Andesite	MGL-AND	41.2	4.7*
CGL 012	Gabbro	MGR-T	45.32	2.86
CGL 014	Basalt	MBL-D	64	13
CGL 010	Zeolite, spiked	MGL-ZEO-S	79.3	3.1*
CGL 011	Diorite	MDR	100	3.74
CGL 111	Rare-earth ore	TRM-2	128	58
CGL 128	Lithium ore	MLiH	186	5*
CGL 112	Tungsten-molybdenum ore	WMo	220	20
CGL 113	Iron ore	TTH	300	60
CGL 022	Greisen	MGn	563	24
CGL 013	Gabbro	MGR-N	608	48
CGL 201	Tailings of copper-molybdenum ore floatation	CuMoH	1150	50
CGL 207	Zinc concentrate	MZnB	1940	111*
CGL 120	Gold-bearing complex ore	AHMH-1	4300	130
CGL 108	Silver-bearing complex ore	TsAg	4400	280
CGL 104	Silver ore	RS-1	4600	300
CGL 123	Gold-copper ore	OTH	7500	500
CGL 105	Silver ore	RS-2	8300	200
CGL 106	Silver ore	RS-3	2.25%	0.06%

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Dy	**Dysprosium**			
IAG/CGL 020	Limestone	ML-3	0.528	0.012
IAG/CGL 019	Trachyandesite	MTA-1	4.03	0.13
CGL 008	Granite	MGT-1	4.42	0.15
CGL 007	Basalt	MBL-1	4.67	0.10
IAG/CGL 018	Rhyolite	MRH-1	9.1	0.2
CGL 124	Rare-earth ore	TRLK	57.63	11.63
CGL 111	Rare-earth ore	TRM-2	206	32
Er	**Erbium**			
IAG/CGL 020	Limestone	ML-3	0.298	0.007*
IAG/CGL019	Trachyandesite	MTA-1	1.62	0.05*
CGL 007	Basalt	MBL-1	1.84	0.05
CGL 008	Granite	MGT-1	2.37	0.10
IAG/CGL 018	Rhyolite	MRH-1	4.4	0.1*
CGL 111	Rare-earth ore	TRM-2	79.5	8.5
Eu	**Europium**			
IAG/CGL 020	Limestone	ML-3	0.143	0.007*
IAG/CGL 018	Rhyolite	MRH-1	0.471	0.021*
CGL 008	Granite	MGT-1	0.58	0.02
CGL 009	Andesite	MGL-AND	1.44	0.06*
CGL 007	Basalt	MBL-1	2.62	0.06
IAG/CGL 019	Trachyandesite	MTA-1	3.36	0.10*
CGL 124	Rare-earth ore	TRLK	87.22	8.68
CGL 111	Rare-earth ore	TRM-2	211.6	16.20
F	**Fluorine**			
CGL 002	Alkaline granite	IAG CRM-3	1.13 %	0.16 %*
CGL 101	Fluorspar	MGL-OShBO HJ	34.92 %	0.19 %

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, %	Confidence interval, %
TFe_2O_3	**Total ferric oxide**			
CGL 021	Dolomite	MDL	0.228	0.007*
CGL 101	Fluorspar	HJ	0.34	0.014
IAG/CGL 020	Limestone	ML-3	0.349	0.012*
CGL 102	Phosphorite	HF	0.37	0.03
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	0.50	0.029*
CGL 107	Phosphorite	BF	0.63	0.067
CGL 128	Lithium ore	MLiH	0.663	0.018*
CGL 017	Natural Zeolite	M-ZEO-N	0.802	0.039*
CGL 010	Zeolite, spiked	MGL-ZEO-S	1.27	0.07*
IAG/CGL 018	Rhyolite	MRH-1	1.81	0.06*
CGL 117	Epithermal gold ore	EAu-1	2.18	0.15
CGL 008	Granite	MGT-1	2.44	0.05
CGL 006	Nepheline syenite	LNS	2.63	0.13
CGL 022	Greisen	MGn	3.25	0.09*
CGL 003	Graphite	BJBCh	3.48	0.16
CGL 004	Graphite	ZBCh	3.61	0.19
CGL 201	Tailings of copper-molybdenum ore floatation	CuMoH	3.90	0.20
CGL 012	Gabbro	MGR-T	4.22	0.13
CGL 015	Nepheline syenite	HNS	4.67	0.11
CGL 009	Andesite	MGL-AND	5.43	0.18*
CGL 112	Tungsten-molybdenum ore	WMo	5.59	0.17
CGL 124	Rare-earth ore	TRLK	5.71	0.17
IAG/CGL 019	Trachyandesite	MTA-1	5.91	0.04*
CGL 108	Silver -bearing complex ore	TsAg	7.425	0.18
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS	8.00	0.22*
CGL 011	Diorite	MDR	8.10	0.11
CGL 007	Basalt	MBL-1	9.85	0.06
CGL 207	Zinc concentrate	MZnB	10.45	0.51*
CGL 013	Gabbro	MGR-N	10.99	0.30
CGL 014	Basalt	MBL-D	12.66	0.24
CGL 119	Chromium ore	HHH	14.73	0.38
CGL 127	Manganese ore	MnH	19.51	0.37*
CGL 129	Titanium ore	TiH	61.86	0.44*
CGL 113	Iron ore	TTH	[1]62.20	[1]0.20

[1]certified value by element
*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, %	Confidence interval, %
Fe_2O_3	**Ferric oxide**			
CGL 005	Magnesite	GM	0.05	0.009
CGL 109	Gold-quartz ore	ZB-1	1.92	0.12
CGL 125	Mercury ore	Hg	4.66	0.11
CGL 111	Rare-earth ore	TRM-2	13.45	0.26
CGL 120	Gold-bearing complex ore	AHMH-1	14.71	0.24
CGL 105	Silver ore	RS-2	48.40	0.40
FeO	**Ferrous oxide**			
CGL 111	Rare-earth ore	TRM-2	0.14	0.03
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	0.299	0.004*
CGL 125	Mercury ore	Hg	0.49	0.075
CGL 006	Nepheline syenite	LNS	0.80	0.06
CGL 008	Granite	MGT-1	1.81	0.11
CGL 012	Gabbro	MGR-T	2.00	0.12
CGL 015	Nepheline syenite	HNS	2.60	0.11
CGL 112	Tungsten-molybdenum ore	WMo	3.72	0.2
CGL 013	Gabbro	MGR-N	4.57	0.22
CGL 011	Diorite	MDR	4.82	0.22
CGL 007	Basalt	MBL-1	6.15	0.16
CGL 113	Iron ore	TTH	21.06	0.22

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Ga	**Gallium**			
IAG/CGL 020	Limestone	ML-3	1.48	0.11*
CGL 010	Zeolite, spiked	MGL-ZEO-S	13.8	0.8*
CGL 017	Natural Zeolite	M-ZEO-N	14.84	1.21*
CGL 013	Gabbro	MGR-N	17.94	1.41
CGL 012	Gabbro	MGR-T	18.87	1.75
CGL 011	Diorite	MDR	19.58	1.46
CGL 009	Andesite	MGL-AND	21.1	0.8*
CGL 014	Basalt	MBL-D	21.20	3.5
IAG/CGL 019	Trachyandesite	MTA-1	21.7	0.6*
CGL 007	Basalt	MBL-1	22.63	0.45
CGL 015	Nepheline syenite	HNS	22.63	1.01
CGL 008	Granite	MGT-1	22.80	0.52
CGL 006	Nepheline syenite	LNS	23	0.8
IAG/CGL 018	Rhyolite	MRH-1	24.6	0.8*
CGL 022	Greisen	MGn	26.1	1.9*
Gd	**Gadolinium**			
IAG/CGL 020	Limestone	ML-3	0.611	0.013*
CGL 008	Granite	MGT-1	4.95	0.13
CGL 007	Basalt	MBL-1	7.17	0.14
IAG/CGL018	Rhyolite	MRH-1	11.4	0.2*
CGL 111	Rare-earth ore	TRM-2	553	83
Ge	**Germanium**			
CGL 007	Basalt	MBL-1	1.29	0.10
CGL 008	Granite	MGT-1	1.50	0.17
H^{daf}	**Hydrogen** dry ash-free			
CGL 403	Coking coal	TTKN	4.88 %	0.39 %
CGL 401	Brown coal	BNN	5.27 %	1.59 %

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Hf	**Hafnium**			
IAG/CGL 020	Limestone	ML-3	0.395	0.029*
CGL 009	Andesite	MGL-AND	3.80	0.28*
CGL 008	Granite	MGT-1	4.75	0.13
CGL 007	Basalt	MBL-1	6.63	0.21
IAG/CGL 019	Trachyandesite	MTA-1	8.3	0.4*
IAG/CGL 018	Rhyolite	MRH-1	14.6	0.9*
Hg	**Mercury**			
CGL 303	Mercury Soil	MS-1	0.157	0.028*
CGL 304	Mercury Soil	MS-2	1.52	0.08*
CGL 305	Mercury Soil	MS-3	2.75	0.19*
CGL 125	Mercury ore	Hg	689	46
Ho	**Holmium**			
IAG/CGL 020	Limestone	ML-3	0.103	0.004*
IAG/CGL 019	Trachyandesite	MTA-1	0.658	0.012*
CGL 007	Basalt	MBL-1	0.78	0.02
CGL 008	Granite	MGT-1	0.85	0.03
IAG/CGL 018	Rhyolite	MRH-1	1.62	0.04*
CGL 124	Rare-earth ore	TRLK	7.86	1.72
CGL 111	Rare-earth ore	TRM-2	36.6	7.4
In	**Indium**			
CGL 207	Zinc concentrate	MZnB	152.9	8.2*

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, %	Confidence interval, %
H_2O^-	**Moisture**			
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	0.074	0.02*
CGL 117	Epithermal gold ore	EAu-1	0.10	0.02
CGL 119	Chromium ore	HHH	0.11	0.03
H_2O^+	**Structural water**			
CGL 011	Diorite	MDR	0.35	0.03
K_2O	**Potassium oxide**			
CGL 005	Magnesite	GM	0.011	0.005
CGL 125	Mercury ore	Hg	0.03	0.005
CGL 021	Dolomite	MDL	0.062	0.004*
CGL 113	Iron ore	TTH	0.07	0.01
CGL 102	Phosphorite	HF	0.077	0.006
CGL 107	Phosphorite	BF	0.092	0.015
CGL 013	Gabbro	MGR-N	0.11	0.01
CGL 129	Titanium ore	TiH	0.137	0.005
IAG/CGL 020	Limestone	ML-3	0.229	0.009*
CGL 012	Gabbro	MGR-T	0.31	0.03
CGL 109	Gold-quartz ore	ZB-1	0.37	0.03
CGL 105	Silver ore	RS-2	0.53	0.03
CGL 120	Gold-bearing complex ore	AHMH-1	0.64	0.03
CGL 111	Rare-earth ore	TRM-2	0.91	0.08
CGL 101	Fluorspar	HJ	0.99	0.05
CGL 022	Greisen	MGn	1.47	0.16*
CGL 117	Epithermal gold ore	EAu-1	1.48	0.09
CGL 124	Rare-earth ore	TRLK	1.55	0.05
CGL 011	Diorite	MDR	1.55	0.07
CGL 108	Silver -bearing complex ore	TsAg	1.56	0.10
CGL 014	Basalt	MBL-D	1.72	0.05
CGL 004	Graphite	ZBCh	2.09	0.09
CGL 009	Andesite	MGL-AND	2.42	0.06*
CGL 003	Graphite	BJBCh	2.54	0.07
CGL 123	Gold-copper ore	OTH	2.81	0.14
CGL 010	Zeolite, spiked	MGL-ZEO-S	3.19	0.16*
CGL 017	Natural Zeolite	M-ZEO-N	3.21	0.08*
CGL 002	Alkaline granite	MGL-OShBO	3.58	0.04*
CGL 007	Basalt	MBL-1	3.99	0.04
CGL 112	Tungsten-molybdenum ore	WMo	4.32	0.07
CGL 015	Nepheline syenite	HNS	4.44	0.26
CGL 008	Granite	MGT-1	4.68	0.04
IAG/CGL 019	Trachyandesite	MTA-1	4.85	0.04*
IAG/CGL 018	Rhyolite	MRH-1	5.17	0.03*
CGL 128	Lithium ore	MLiH	6.28	0.07*
CGL 006	Nepheline syenite	LNS	9.10	0.73

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
La	**Lanthanum**			
IAG/CGL 020	Limestone	ML-3	3.71	0.10*
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	8.4	0.7*
CGL 011	Diorite	MDR	24.40	2.83
CGL 009	Andesite	MGL-AND	26.2	1.7*
CGL 015	Nepheline syenite	HNS	27.48	2.10
CGL 008	Granite	MGT-1	29.59	0.57
CGL 014	Basalt	MBL-D	35.11	2.81
CGL 010	Zeolite, spiked	MGL-ZEO-S	37.2	1.8*
CGL 007	Basalt	MBL-1	55.99	0.94
IAG/CGL 018	Rhyolite	MRH-1	68.0	1.7*
IAG/CGL 019	Trachyandesite	MTA-1	112	4*
CGL 006	Nepheline syenite	LNS	163	12
CGL 111	Rare-earth ore	TRM-2	1.93%	0.10%
CGL 124	Rare-earth ore	TRLK	2.11%	0.11%
Li	**Lithium**			
IAG/CGL 020	Limestone	ML-3	9.7	0.8*
CGL 007	Basalt	MBL-1	11.08	0.55
CGL 124	Rare-earth ore	TRLK	21.78	2.23
IAG/CGL 019	Trachyandesite	MTA-1	22.7	1.2*
IAG/CGL 018	Rhyolite	MRH-1	47	3*
CGL 006	Nepheline syenite	LNS	54	5
CGL 015	Nepheline syenite	HNS	64.95	3.84
CGL 008	Granite	MGT-1	124	14
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	1730	40*
CGL 128	Lithium ore	MLiH	[2]0.578%	0.015*

[2]certified value by oxide (Li_2O)
*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, %	Confidence interval, %
LOI	**Loss on ignition**			
CGL 011	Diorite	MDR	0.51	0.03
CGL 008	Granite	MGT-1	0.64	0.03
CGL 109	Gold-quartz ore	ZB-1	0.95	0.06
CGL 015	Nepheline syenite	HNS	1.05	0.053
CGL 119	Chromium ore	HHH	1.07	0.06
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	1.10	0.04*
CGL 009	Andesite	MGL-AND	1.39	0.05*
CGL 012	Gabbro	MGR-T	1.40	0.06
CGL 022	Greisen	MGn	1.46	0.05*
CGL 120	Gold-bearing complex ore	AHMH-1	2.59	0.11
CGL 117	Epithermal gold ore	EAu-1	2.84	0.10
CGL 006	Nepheline syenite	LNS	3.35	0.07
CGL 123	Gold-copper ore	OTH	5.43	0.17
CGL 107	Phosphorite	BF	6.43	0.06
CGL 111	Rare-earth ore	TRM-2	6.78	0.22
CGL 010	Zeolite, spiked	MGL-ZEO-S	8.80	0.46*
CGL 017	Natural Zeolite	M-ZEO-N	9.77	1.12*
CGL 001	Serpentinite	MGL-GAS	13.33	0.14*
CGL 004	Graphite	ZBCh	17.0	0.09
CGL 003	Graphite	BJBCh	22.21	0.14
CGL 125	Mercury ore	Hg	25.28	0.15
CGL 124	Rare-earth ore	TRLK	30.56	0.12
IAG/CGL 020	Limestone	ML-3	40.29	0.17*
CGL 005	Magnesite	GM	51.35	0.31

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Lu	**Lutetium**			
IAG/CGL 020	Limestone	ML-3	0.0412	0.0022*
IAG/CGL 019	Trachyandesite	MTA-1	0.179	0.005*
CGL 007	Basalt	MBL-1	0.19	0.01
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	0.326	0.021*
CGL 008	Granite	MGT-1	0.35	0.01
IAG/CGL 018	Rhyolite	MRH-1	0.58	0.02*
CGL 111	Rare-earth ore	TRM-2	7.64	1.08

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, %	Confidence interval, %
MgO	**Magnesium oxide**			
CGL 128	Lithium ore	MLiH	0.033	0.005*
CGL 022	Greisen	MGn	0.044	0.009*
IAG/CGL 018	Rhyolite	MRH-1	0.094	0.01*
CGL 006	Nepheline syenite	LNS	0.24	0.02
CGL 117	Epithermal gold ore	EAu-1	0.37	0.04
CGL 015	Nepheline syenite	HNS	0.37	0.02
CGL 008	Granite	MGT-1	0.38	0.01
CGL 108	Silver -bearing complex ore	TsAg	0.45	0.04
CGL 111	Rare-earth ore	TRM-2	0.50	0.02
CGL 017	Natural Zeolite	M-ZEO-N	0.55	0.06*
CGL 010	Zeolite, spiked	MGL-ZEO-S	0.573	0.026*
CGL 127	Manganese ore	MnH	0.79	0.02*
CGL 120	Gold-bearing complex ore	AHMH-1	1.01	0.07
IAG/CGL 020	Limestone	ML-3	1.385	0.024*
CGL 105	Silver ore	RS-2	1.48	0.04
IAG/CGL 019	Trachyandesite	MTA-1	1.74	0.03*
CGL 003	Graphite	BJBCh	1.94	0.09
CGL 112	Tungsten-molybdenum ore	WMo	2.04	0.10
CGL 107	Phosphorite	BF	2.26	0.22
CGL 113	Iron ore	TTH	2.78	0.08
CGL 124	Rare-earth ore	TRLK	2.78	0.05
CGL 012	Gabbro	MGR-T	2.85	0.06
CGL 129	Titanium ore	TiH	3.05	0.04*
CGL 009	Andesite	MGL-AND	3.52	0.22*
CGL 011	Diorite	MDR	3.81	0.24
CGL 013	Gabbro	MGR-D	4.51	0.08
CGL 123	Gold-copper ore	OTH	5.52	0.10
CGL 007	Basalt	MBL-1	6.33	0.05
CGL 014	Basalt	MBL-D	8.03	0.29
CGL 102	Phosphorite	HF	8.30	0.10
CGL 125	Mercury ore	Hg	9.93	0.15
CGL 119	Chromium ore	HHH	16.09	0.51
CGL 021	Dolomite	MDL	21.4	0.18*
CGL 001	Serpentinite	IAG CRM-2	38.22	0.34*
CGL 005	Magnesite	MGL-GAS GM	45.80	0.45

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, %	Confidence interval, %
MnO	**Manganese oxide**			
CGL 017	Natural Zeolite	M-ZEO-N	0.007	0.001*
CGL 117	Epithermal gold ore	EAu-1	0.017	0.002
IAG/CGL 020	Limestone	ML-3	0.0231	0.0010*
CGL 109	Gold-quartz ore	ZB-1	0.025	0.011
CGL 003	Graphite	BJBCh	0.03	0.01
CGL 120	Gold-bearing complex ore	AHMH-1	0.03	0.003
CGL 010	Zeolite, spiked	MGL-ZEO-S	0.033	0.005*
IAG/CGL 019	Trachyandesite	MTA-1	0.0469	0.0010*
CGL 021	Dolomite	MDL	0.047	0.003*
CGL 008	Granite	MGT-1	0.06	0.001
CGL 004	Graphite	ZBCh	0.07	0.01
IAG/CGL 018	Rhyolite	MRH-1	0.0713	0.0009*
CGL 012	Gabbro	MGR-T	0.08	0.02
CGL 009	Andesite	MGL-AND	0.081	0.001*
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS	0.082	0.009*
CGL 013	Gabbro	MGR-N	0.10	0.01
CGL 022	Greisen	MGn	0.102	0.004*
CGL 113	Iron ore	TTH	0.105	0.006
CGL 112	Tungsten-molybdenum ore	WMo	0.12	0.02
CGL 123	Gold-copper ore	OTH	0.12	0.03
CGL 011	Diorite	MDR	0.12	0.01
CGL 007	Basalt	MBL-1	0.13	0.002
CGL 111	Rare-earth ore	TRM-2	0.14	0.01
CGL 006	Nepheline syenite	LNS	0.14	0.01
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	0.149	0.017*
CGL 014	Basalt	MBL-D	0.15	0.01
CGL 119	Chromium ore	HHH	0.15	0.03
CGL 129	Titanium ore	TiH	0.24	0.006*
CGL 125	Mercury ore	Hg	0.29	0.006
CGL 128	Lithium ore	MLiH	0.603	0.018*
CGL 124	Rare-earth ore	TRLK	1.67	0.05
CGL 105	Silver ore	RS-2	2.77	0.06
CGL 207	Zinc concentrate	MZnB	6.20	0.15*
CGL 127	Manganese ore	MnH	45.9	0.54*

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Mo	**Molybdenum**			
CGL 008	Granite	MGT-1	3.06	0.16
CGL 007	Basalt	MBL-1	5.20	0.26
CGL 124	Rare-earth ore	TRLK	34.40	3.41
CGL 123	Gold-copper ore	OTH	51.8	6.3
CGL 201	Tailings of copper-molybdenum ore floatation	CuMoH	70	7
CGL 207	Zinc concentrate	MZnB	255.6	18.4*
CGL 112	Tungsten-molybdenum ore	WMo	0.079%	0.003%
CGL 120	Gold-bearing complex ore	AHMH-1	0.11%	0.003%
Nb	**Niobium**			
IAG/CGL 020	Limestone	ML-3	0.80	0.12*
CGL 009	Andesite	MGL-AND	3.23	0.69*
CGL 011	Diorite	MDR	6.92	0.31
CGL 010	Zeolite, spiked	MGL-ZEO-S	14.1	2.2*
CGL 017	Natural Zeolite	M-ZEO-N	14.17	1.26*
IAG/CGL 019	Trachyandesite	MTA-1	14.8	0.8*
CGL 008	Granite	MGT-1	15.22	0.48
CGL 015	Nepheline syenite	HNS	22.63	0.85
CGL 022	Greisen	MGn	28.4	2.8
CGL 124	Rare-earth ore	TRLK	31	4.54
CGL 006	Nepheline syenite	LNS	40	0.97
CGL 007	Basalt	MBL-1	52.21	1.28
CGL 014	Basalt	MBL-D	56.50	4.94
CGL 002	Alkaline granite	IAG CRM-3	64	4*
IAG/CGL 018	Rhyolite	MGL-OShBO MRH-1	75	3*

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, %	Confidence interval, %
Na_2O	**Sodium oxide**			
CGL 117	Epithermal gold ore	EAu-1	0.055	0.025
CGL 109	Gold-quartz ore	ZB-1	0.07	0.01
CGL 125	Mercury ore	Hg	0.07	0.012
CGL 102	Phosphorite	HF	0.12	0.02
CGL 120	Gold-bearing complex ore	AHMH-1	0.17	0.02
IAG/CGL 020	Limestone	ML-3	0.228	0.013*
CGL 124	Rare-earth ore	TRLK	0.25	0.03
CGL 003	Graphite	BJBCh	0.47	0.04
CGL 004	Graphite	ZBCh	0.51	0.04
CGL 111	Rare-earth ore	TRM-2	0.92	0.05
CGL 013	Gabbro	MGR-N	1.41	0.09
CGL 112	Tungsten-molybdenum ore	WMo	2.13	0.10
CGL 123	Gold-copper ore	OTH	2.36	0.07
CGL 012	Gabbro	MGR-T	2.42	0.15
CGL 011	Diorite	MDR	3.33	0.09
CGL 017	Natural Zeolite	M-ZEO-N	3.35	0.16*
CGL 010	Zeolite, spiked	MGL-ZEO-S	3.44	0.09*
CGL 008	Granite	MGT-1	3.63	0.03
CGL 014	Basalt	MBL-D	3.63	0.27
IAG/CGL 018	Rhyolite	MRH-1	3.73	0.09*
CGL 007	Basalt	MBL-1	4.40	0.03
IAG/CGL 019	Trachyandesite	MTA-1	4.41	0.04*
CGL 009	Andesite	MGL-AND	4.46	0.28*
CGL 002	Alkaline granite	IAG CRM-3	5.34	0.26*
CGL 006	Nepheline syenite	MGL-OShBO LNS	6.78	0.23
CGL 015	Nepheline syenite	HNS	9.76	0.76

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Nd	**Neodymium**			
IAG/CGL 020	Limestone	ML-3	3.32	0.08*
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	15.5	0.5*
CGL 008	Granite	MGT-1	27.10	2.21
CGL 009	Andesite	MGL-AND	27.2	0.80*
CGL 010	Zeolite, spiked	MGL-ZEO-S	27.3	2.2*
CGL 015	Nepheline syenite	HNS	27.34	2.47
CGL 011	Diorite	MDR	30.48	4.22
CGL 014	Basalt	MBL-D	36.33	3.18
CGL 007	Basalt	MBL-1	46.62	1.02
CGL 124	Rare-earth ore	TRLK	0.65%	0.03%
IAG/CGL 018	Rhyolite	MRH-1	67.5	2.1*
IAG/CGL 019	Trachyandesite	MTA-1	90.7	2.9*
CGL 111	Rare-earth ore	TRM-2	0.88%	0.08%
Ni	**Nickel**			
IAG/CGL 020	Limestone	ML-3	5	2*
CGL 008	Granite	MGT-1	5.76	0.28
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	10.7	1.6*
CGL 207	Zinc concentrate	MZnB	11.18	1.70*
CGL 124	Rare-earth ore	TRLK	13.18	3.50
CGL 010	Zeolite, spiked	MGL-ZEO-S	14.6	0.9*
CGL 013	Gabbro	MGR-N	23.34	5.36
CGL 012	Gabbro	MGR-T	23.94	3.26
CGL 123	Gold-copper ore	OTH	25.4	5.8
IAG/CGL 019	Trachyandesite	MTA-1	27.0	1.3*
CGL 120	Gold-bearing complex ore	AHMH-1	28.27	6.68
CGL 112	Tungsten-molybdenum ore	WMo	35	6
CGL 011	Diorite	MDR	40.94	3.24
CGL 009	Andesite	MGL-AND	61.2	4.1*
CGL 003	Graphite	BJBCh	0.007%	0.001%
CGL 111	Rare-earth ore	TRM-2	70.8	11.2
CGL 113	Iron ore	TTH	0.008%	0.001%
CGL 007	Basalt	MBL-1	162	12
CGL 014	Basalt	MBL-D	163	21
CGL 129	Titanium ore	TiH	306	17*
CGL 127	Manganese ore	MnH	377	18*
CGL 119	Chromium ore	HHH	0.09%	0.02%
CGL 125	Mercury ore	Hg	0.1%	0.003%
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS	2300	120*

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Pb	**Lead**			
IAG/CGL 020	Limestone	ML-3	2.9	0.4*
CGL 013	Gabbro	MGR-N	4.68	0.68
CGL 014	Basalt	MBL-D	5.66	0.41
CGL 012	Gabbro	MGR-T	6.00	0.79
CGL 015	Nepheline syenite	HNS	7.00	2.58
CGL 007	Basalt	MBL-1	8.70	0.20
CGL 011	Diorite	MDR	8.97	0.80
CGL 009	Andesite	MGL-AND	18.7	1.0*
CGL 117	Epithermal gold ore	EAu-1	0.002%	0.001%
CGL 017	Natural Zeolite	M-ZEO-N	21.78	4.21
CGL 008	Granite	MGT-1	24.81	0.69
CGL 123	Gold-copper ore	OTH	27	3
IAG/CGL 019	Trachyandesite	MTA-1	34.1	1.2*
IAG/CGL 018	Rhyolite	MRH-1	47	2*
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	63	6*
CGL 112	Tungsten-molybdenum ore	WMo	76	17
CGL 010	Zeolite, spiked	MGL-ZEO-S	84.2	5.1*
CGL 006	Nepheline syenite	LNS	114	20
CGL 106	Silver ore	RS-3	0.041%	0.003%
CGL 128	Lithium ore	MLiH	558	53*
CGL 104	Silver ore	RS-1	0.1%	0.006%
CGL 111	Rare-earth ore	TRM-2	0.11%	0.014%
CGL 105	Silver ore	RS-2	0.13%	0.01%
CGL 124	Rare-earth ore	TRLK	0.16%	0.007%
CGL 207	Zinc concentrate	MZnB	3407	448*
CGL 108	Silver -bearing complex ore	TsAg	10%	0.23%

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, %	Confidence interval, %
P_2O_5	**Phosphorus pentoxide**			
IAG/CGL 018	Rhyolite	MRH-1	0.010	0.002*
CGL 022	Greisen	MGn	0.018	0.002*
CGL 119	Chromium ore	HHH	0.02	0.01
CGL 129	Titanium ore	TiH	0.022	0.003*
CGL 002	Alkaline granite	IAG CRM-3	0.0293	0.0017*
CGL 017	Natural Zeolite	MGL-OShBO M-ZEO-N	0.030	0.003*
CGL 010	Zeolite, spiked	MGL-ZEO-S	0.032	0.002*
CGL 109	Gold-quartz ore	ZB-1	0.037	0.007
CGL 006	Nepheline syenite	LNS	0.04	0.05
CGL 021	Dolomite	MDL	0.044	0.002*
CGL 120	Gold-bearing complex ore	AHMH-1	0.05	0.003
CGL 130	Fluorspar	M-HJ-55	[1]0.028	0.004*
IAG/CGL 020	Limestone	ML-3	0.0659	0.0022*
CGL 012	Gabbro	MGR-T	0.078	0.005
CGL 135	Fluorspar	M-HJ-35	[1]0.037	0.004*
CGL 108	Silver-bearing complex ore	TsAg	0.12	0.01
CGL 117	Epithermal gold ore	EAu-1	0.125	0.027
CGL 008	Granite	MGT-1	0.13	0.008
CGL 015	Nepheline syenite	HNS	0.139	0.010
CGL 124	Rare-earth ore	TRLK	0.22	0.01
CGL 009	Andesite	MGL-AND	0.264	0.004*
CGL 123	Gold-copper ore	OTH	0.27	0.02
CGL 105	Silver ore	RS-2	0.54	0.01
CGL 014	Basalt	MBL-D	0.70	0.02
CGL 127	Manganese ore	MnH	0.76	0.02*
CGL 007	Basalt	MBL-1	0.85	0.04
IAG/CGL 019	Trachyandesite	MTA-1	1.002	0.007*
CGL 102	Phosphorite	HF	13.81	0.11
CGL 111	Rare-earth ore	TRM-2	19.26	0.28
CGL 107	Phosphorite	BF	26.38	0.13

[1]certified value by element;
*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Pr	**Praseodymium**			
IAG/CGL 020	Limestone	ML-3	0.85	0.03*
CGL 008	Granite	MGT-1	7.27	0.18
CGL 007	Basalt	MBL-1	11.90	0.24
IAG/CGL 018	Rhyolite	MRH-1	18.5	0.3*
IAG/CGL 019	Trachyandesite	MTA-1	25.3	0.7*
CGL 124	Rare-earth ore	TRLK	0.23%	0.03%
CGL 111	Rare-earth ore	TRM-2	0.28%	0.03%
Rb	**Rubidium**			
CGL 012	Gabbro	MGR-T	6.58	2.76
IAG/CGL 020	Limestone	ML-3	11.5	0.5*
CGL 014	Basalt	MBL-D	28.60	3.7
CGL 111	Rare-earth ore	TRM-2	43	10
CGL 011	Diorite	MDR	48.5	4.49
CGL 009	Andesite	MGL-AND	49.7	1.2*
CGL 007	Basalt	MBL-1	63.05	0.98
CGL 124	Rare-earth ore	TRLK	67.12	3.91
CGL 015	Nepheline syenite	HNS	85.36	3.64
IAG/CGL 019	Trachyandesite	MTA-1	104	3*
CGL 010	Zeolite, spiked	MGL-ZEO-S	106	3*
CGL 017	Natural Zeolite	M-ZEO-N	107	4*
CGL 003	Graphite	BJBCh	0.014%	0.002%
CGL 006	Nepheline syenite	LNS	207	16
IAG/CGL 018	Rhyolite	MRH-1	274	4*
CGL 008	Granite	MGT-1	275	3
CGL 022	Greisen	MGn	463	57*
CGL 112	Tungsten-molybdenum ore	WMo	0.106%	0.007%
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	2360	110*

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, %	Confidence interval, %
S^{d}_{total}	**total Sulpur**			
CGL 401	Brown coal	BNN	0.54[3]	0.03
CGL 402	Hard coal	SOEN	0.78[3]	0.04
CGL 403	Coking coal	TTKN	1.21[3]	0.08
SO_3	**Sulphur trioxide**			
CGL 119	Chromium ore	HHH	0.07	0.03
CGL 135	Fluorspar	M-HJ-35	[1]0.41	0.04*
CGL 123	Gold-copper ore	OTH	3.87	0.15
CGL 111	Rare-earth ore	TRM-2	4.58	0.32
CGL 201	Tailing of copper-molybdenum ore floatation	CuMoH	[1]2.03	0.04
CGL 105	Silver ore	RS-2	6.85	0.01
CGL 113	Iron ore	TTH	7.14	0.30
CGL 108	Silver -bearing complex ore	TsAg	21.25	0.41
CGL 207	Zinc concentrate	MZnB	31.12	3.52*

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Sb	**Antimony**			
CGL 008	Granite	MGT-1	0.19	0.03
CGL 007	Basalt	MBL-1	0.28	0.04
IAG/CGL 019	Trachyandesite	MTA-1	8.5	1.1*
CGL 117	Epithermal gold ore	EAu-1	0.14%	0.02%
CGL 105	Silver ore	RS-2	0.50%	0.04%

[1]certified value by element;
[3]-dry basis analysis
*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Sc	**Scandium**			
IAG/CGL 020	Limestone	ML-3	0.71	0.20*
IAG/CGL 018	Rhyolite	MRH-1	2.3	0.5*
CGL 015	Nepheline syenite	HNS	2.76	0.41
CGL 010	Zeolite, spiked	MGL-ZEO-S	3.27	0.90*
CGL 008	Granite	MGT-1	4.36	0.20
IAG/CGL 019	Trachyandesite	MTA-1	8.6	0.7*
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	9.2	1.4*
CGL 007	Basalt	MBL-1	10.1	0.70
CGL 009	Andesite	MGL-AND	11.8	4.0*
CGL 012	Gabbro	MGR-T	12.33	1.40
CGL 014	Basalt	MBL-D	19.33	1.23
CGL 011	Diorite	MDR	20.46	1.68
CGL 013	Gabbro	MGR-N	39.66	4.71

*-measurement uncertainty

CGL code	Description	Designation	Certified value, %	Confidence interval, %
SiO_2	**Silicon dioxide**			
CGL 005	Magnesite	GM	0.25	0.04
CGL 021	Dolomite	MDL	0.267	0.033*
CGL 113	Iron ore	TTH	3.37	0.11
CGL 119	Chromium ore	HHH	4.73	0.24
IAG/CGL 020	Limestone	ML-3	5.76	0.09*
CGL 129	Titanium ore	TiH	7.77	0.35*
CGL 132	Fluorspar	M-HJ-90	10.15	1.37*
CGL 127	Manganese ore	MnH	10.84	0.15*
CGL 124	Rare-earth ore	TRLK	11.86	0.15
CGL 111	Rare-earth ore	TRM-2	14.86	0.17
CGL 105	Silver ore	RS-2	17.80	0.20

CGL code	Description	Designation	Certified value, %	Confidence interval, %
SiO_2	**Silicon dioxide**			
CGL 107	Phosphorite	BF	20.57	0.16
CGL 101	Fluorspar	HJ	23.01	0.01
CGL 001	Serpentinite	IAG CRM-2	38.54	0.23*
CGL 125	Mercury ore	MGL-GAS Hg	41.01	0.14
CGL 108	Silver -bearing complex ore	TsAg	42.08	0.26
CGL 013	Gabbro	MGR-N	43.15	0.30
CGL 130	Fluorspar	M-ХЖ-55	43.44	1.75*
CGL 135	Fluorspar	M-ХЖ-35	47.67	3.29*
CGL 012	Gabbro	MGR-T	48.00	0.19
CGL 014	Basalt	MBL-D	48.34	0.64
CGL 102	Phosphorite	HF	28.04	0.12
CGL 007	Basalt	MBL-1	51.85	0.15
CGL 006	Nepheline syenite	LNS	51.88	0.24
CGL 123	Gold-copper ore	OTH	52.09	0.32
CGL 003	Graphite	BJBCh	52.20	0.25
CGL 015	Nepheline syenite	HNS	52.20	0.20
CGL 004	Graphite	ZBCh	52.84	0.30
CGL 011	Diorite	MDR	57.75	0.48
IAG/CGL 019	Trachyandesite	MTA-1	58.64	0.20*
CGL 009	Andesite	MGL-AND	59.20	0.57*
CGL 112	Tungsten-molybdenum ore	WMo	64.87	0.34
CGL 010	Zeolite, spiked	MGL-ZEO-S	67.64	0.96*
CGL 017	Natural Zeolite	M-ZEO-N	67.64	3.58*
CGL 002	Alkaline granite	IAG CRM-3	71.72	0.29*
CGL 008	Granite	MGL-OShBO MGT-1	72.37	0.12
CGL 128	Lithium ore	MLiH	73.40	0.65*
IAG/CGL 018	Rhyolite	MRH-1	76.39	0.19*
CGL 120	Gold-bearing complex ore	AHMH-1	77.37	0.26
CGL 022	Greisen	MGn	80.93	0.40*
CGL 117	Epithermal gold ore	EAu-1	84.70	0.84
CGL 109	Gold-quartz ore	ZB-1	92.57	0.39

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Sm	**Samarium**			
IAG/CGL 020	Limestone	ML-3	0.638	0.017*
CGL 009	Andesite	MGL-AND	5.16	0.14*
CGL 008	Granite	MGT-1	5.54	0.15
CGL 002	Alkaline granite	IAG CRM-3	6.0	0.4*
CGL 007	Basalt	MGL-OShBO MBL-1	8.72	0.15
IAG/CGL 019	Trachyandesite	MTA-1	13.2	0.3*
IAG/CGL 018	Rhyolite	MRH-1	14.8	0.3*
CGL 124	Rare-earth ore	TRLK	539	62
CGL 111	Rare-earth ore	TRM-2	0.09%	0.03%
Sn	**Tin**			
IAG/CGL 020	Limestone	ML-3	0.66	0.12*
IAG/CGL 019	Trachyandesite	MTA-1	1.8	0.4*
CGL 007	Basalt	MBL-1	2.66	0.17
IAG/CGL 018	Rhyolite	MRH-1	6.2	0.3*
CGL 008	Granite	MGT-1	13.30	0.55
CGL 022	Greisen	MGn	1884	76*

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Sr	**Strontium**			
IAG/CGL 018	Rhyolite	MRH-1	4.5	0.6*
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS	7.3	0.4*
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	12.3	1.1*
CGL 022	Greisen	MGn	16.6	3.2*
CGL 128	Lithium ore	MLiH	24.54	4.24*
CGL 112	Tungsten-molybdenum ore	WMo	78	20
CGL 120	Gold-bearing complex ore	AHMH-1	88.71	4.09
CGL 008	Granite	MGT-1	111	2
CGL 129	Titanium ore	TiH	152	10*
CGL 123	Gold-copper ore	OTH	259	73
CGL 015	Nepheline syenite	HNS	312	8.48
CGL 125	Mercury ore	Hg	382	30
CGL 011	Diorite	MDR	454	24
CGL 010	Zeolite, spiked	MGL-ZEO-S	635	27*
CGL 017	Natural Zeolite	M-ZEO-N	651	27*
CGL 014	Basalt	MBL-D	741	97
CGL 013	Gabbro	MGR-N	778	36.5
CGL 007	Basalt	MBL-1	927	12
IAG/CGL 020	Limestone	ML-3	1018	30*
CGL 009	Andesite	MGL-AND	1116	21*
CGL 012	Gabbro	MGR-T	1196	35
CGL 127	Manganese ore	MnH	1354	62*
CGL 006	Nepheline syenite	LNS	1740	48
IAG/CGL 019	Trachyandesite	MTA-1	2692	50*
CGL 124	Rare-earth ore	TRLK	0.49%	0.04%
CGL 111	Rare-earth ore	TRM-2	2.24%	0.095%

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Ta	**Tantalum**			
IAG/CGL 020	Limestone	ML-3	0.093	0.013*
IAG/CGL 019	Trachyandesite	MTA-1	0.74	0.05*
CGL 008	Granite	MGT-1	2.56	0.12
CGL 007	Basalt	MBL-1	3.20	0.07
IAG/CGL 018	Rhyolite	MRH-1	4.2	0.3*
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	46.7	2.4*
Tb	**Terbium**			
IAG/CGL 020	Limestone	ML-3	0.092	0.004*
CGL 009	Andesite	MGL-AND	0.49	0.03*
CGL 008	Granite	MGT-1	0.79	0.03
IAG/CGL 019	Trachyandesite	MTA-1	0.871	0.019*
CGL 007	Basalt	MBL-1	0.95	0.03
IAG/CGL 018	Rhyolite	MRH-1	1.70	0.04*
CGL 111	Rare-earth ore	TRM-2	54.6	14.2
Th	**Thorium**			
CGL 020	Limestone	ML-3	0.71	0.03*
CGL 011	Diorite	MDR	3.88	0.14
CGL 009	Andesite	MGL-AND	6.46	0.65*
CGL 007	Basalt	MBL-1	6.95	0.24
IAG/CGL 019	Trachyandesite	MTA-1	11.4	0.4*
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	13.3	0.8*
CGL 010	Zeolite, spiked	MGL-ZEO-S	17.2	1.2*
CGL 008	Granite	MGT-1	19.35	0.46
IAG/CGL 018	Rhyolite	MRH-1	28.9	1.4*
CGL 022	Greisen	MGn	32.9	4.4*
CGL 006	Nepheline syenite	LNS	61.6	7.5
CGL 111	Rare-earth ore	TRM-2	217.58	40.42
CGL 124	Rare-earth ore	TRLK	946	51

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, %	Confidence interval, %
TiO_2	**Titanium dioxide**			
CGL 125	Mercury ore	Hg	0.018	0.004
IAG/CGL 020	Limestone	ML-3	0.043	0.002*
CGL 101	Fluorspar	HJ	0.047	0.004
CGL 109	Gold-quartz ore	ZB-1	0.08	0.01
CGL 022	Greisen	MGn	0.086	0.003*
CGL 113	Iron ore	TTH	0.101	0.008
CGL 119	Chromium ore	HHH	0.11	0.01
CGL 105	Silver ore	RS-2	0.12	0.01
CGL 111	Rare-earth ore	TRM-2	0.15	0.04
CGL 120	Gold-bearing complex ore	AHMH-1	0.15	0.04
CGL 010	Zeolite, spiked	MGL-ZEO-S	0.158	0.004*
CGL 017	Natural Zeolite	M-ZEO-N	0.161	0.005*
CGL 117	Epithermal gold ore	EAu-1	0.17	0.02
IAG/CGL 018	Rhyolite	MRH-1	0.199	0.010*
CGL 124	Rare-earth ore	TRLK	0.20	0.012
CGL 108	Silver-bearing complex ore	TsAg	0.30	0.011
CGL 008	Granite	MGT-1	0.30	0.007
CGL 006	Nepheline syenite	LNS	0.37	0.02
CGL 012	Gabbro	MGR-T	0.37	0.01
CGL 015	Nepheline syenite	HNS	0.37	0.02
CGL 004	Graphite	ZBCh	0.49	0.04
CGL 127	Manganese ore	MnH	0.53	0.01*
CGL 003	Graphite	BJBCh	0.57	0.03
CGL 009	Andesite	MGL-AND	0.71	0.03*
CGL 112	Tungsten-molybdenum ore	WMo	0.82	0.05
CGL 123	Gold-copper ore	OTH	0.93	0.17
CGL 013	Gabbro	MGR-N	0.94	0.02
CGL 011	Diorite	MDR	1.34	0.025
IAG/CGL 019	Trachyandesite	MTA-1	1.395	0.009*
CGL 007	Basalt	MBL-1	2.11	0.02
CGL 014	Basalt	MBL-D	2.68	0.08
CGL 129	Titanium ore	TiH	14.88	0.56*

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
$\sum TR_2O_3$	**Summa rare-earth elements**			
CGL 111	Rare-earth ore	TRM-2	7.56 %	0.25 %
CGL 124	Rare-earth ore	TRLK	8.27 %	0.25 %
Tl	**Thallium**			
CGL 007	Basalt	MBL-1	0.12	0.01
CGL 008	Granite	MGT-1	1.72	0.17
Tm	**Thulium**			
IAG/CGL 020	Limestone	ML-3	0.0437	0.0022*
IAG/CGL 019	Trachyandesite	MTA-1	0.207	0.006*
CGL 007	Basalt	MBL-1	0.23	0.006
CGL 008	Granite	MGT-1	0.37	0.01
IAG/CGL 018	Rhyolite	MRH-1	0.629	0.019*
U	**Uranium**			
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS	0.80	0.04*
IAG/CGL 020	Limestone	ML-3	1.08	0.06*
CGL 007	Basalt	MBL-1	1.64	0.09
IAG/CGL 019	Trachyandesite	MTA-1	1.72	0.15*
CGL 009	Andesite	MGL-AND	1.96	0.12*
CGL 010	Zeolite, spiked	MGL-ZEO-S	3.09	0.31*
IAG/CGL 018	Rhyolite	MRH-1	3.2	0.4*
CGL 008	Granite	MGT-1	5.44	0.16
CGL 207	Zinc concentrate	MZnB	7.86	0.61*
CGL 006	Nepheline syenite	LNS	12.4	1.5
CGL 128	Lithium ore	MLiH	45.28	5.00*

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
V	**Vanadium**			
IAG/CGL 018	Rhyolite	MRH-1	3.4	1.0*
IAG/CGL 020	Limestone	ML-3	5.9	0.4*
CGL 008	Granite	MGT-1	14.03	0.67
CGL 006	Nepheline syenite	LNS	30	3.6
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS	33.4	2.0*
CGL 125	Mercury ore	Hg	38	7.6
CGL 120	Gold-bearing complex ore	AHMH-1	39.33	8.67
CGL 010	Zeolite, spiked	MGL-ZEO-S	42.3	7.7*
CGL 012	Gabbro	MGR-T	85.28	7.51
CGL 112	Tungsten-molybdenum ore	WMo	0.01%	0.002%
IAG/CGL 019	Trachyandesite	MTA-1	102	3*
CGL 007	Basalt	MBL-1	105	2.82
CGL 124	Rare-earth ore	TRLK	115	14.92
CGL 009	Andesite	MGL-AND	123	7*
CGL 111	Rare-earth ore	TRM-2	138.6	18.9
CGL 014	Basalt	MBL-D	197	36
CGL 011	Diorite	MDR	213	38
CGL 123	Gold-copper ore	OTH	335	15
CGL 119	Chromium ore	HHH	0.04%	0.018%
CGL 013	Gabbro	MGR-N	420	64
CGL 129	Titanium ore	TiH	2818	233*
W	**Tungsten**			
CGL 008	Granite	MGT-1	0.56	0.05
IAG/CGL 020	Limestone	ML-3	0.80	0.05*
CGL 007	Basalt	MBL-1	1.15	0.05
CGL 120	Gold-bearing complex ore	AHMH-1	0.01%	0.001%
CGL 128	Lithium ore	MLiH	107	6*
CGL 011	Diorite	MDR	266	26
CGL 112	Tungsten-molybdenum ore	WMo	[2]0.41%	[2]0.03%

[2]certified value by oxide (WO_3);
*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Y	**Yttrium**			
IAG/CGL 020	Limestone	ML-3	3.43	0.22*
CGL 013	Gabbro	MGR-N	4.30	0.51
CGL 012	Gabbro	MGR-T	5.14	0.32
CGL 009	Andesite	MGL-AND	11.8	0.8*
IAG/CGL 019	Trachyandesite	MTA-1	17.7	0.7*
CGL 010	Zeolite, spiked	MGL-ZEO-S	18.6	0.9*
CGL 017	Natural Zeolite	M-ZEO-N	20.36	1.00*
CGL 007	Basalt	MBL-1	20.48	0.48
CGL 006	Nepheline syenite	LNS	23	4
CGL 014	Basalt	MBL-D	23.60	0.86
CGL 011	Diorite	MDR	23.62	1.15
CGL 008	Granite	MGT-1	25.19	0.77
CGL 015	Nepheline syenite	HNS	25.32	1.57
IAG/CGL 018	Rhyolite	MRH-1	44.7	1.9*
CGL 022	Greisen	MGn	94.6	17.7*
CGL 127	Manganese ore	MnH	104	6*
CGL 124	Rare-earth ore	TRLK	167	20
CGL 111	Rare-earth ore	TRM-2	959	40
Yb	**Ytterbium**			
IAG/CGL 020	Limestone	ML-3	0.276	0.007*
CGL 009	Andesite	MGL-AND	1.00	0.05*
IAG/CGL 019	Trachyandesite	MTA-1	1.231	0.021*
CGL 007	Basalt	MBL-1	1.34	0.02
CGL 011	Diorite	MDR	2.05	0.10
CGL 008	Granite	MGT-1	2.36	0.10
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	2.38	0.13*
CGL 015	Nepheline syenite	HNS	2.66	0.24
IAG/CGL 018	Rhyolite	MRH-1	4.0	0.1*
CGL 124	Rare-earth ore	TRLK	17.85	1.92
CGL 111	Rare-earth ore	TRM-2	54.52	5.24

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Zn	**Zinc**			
IAG/CGL 020	Limestone	ML-3	8	2*
CGL 117	Epithermal gold ore	EAu-1	25	6
CGL 017	Natural Zeolite	M-ZEO-N	25.37	1.39*
CGL 001	Serpentinite	IAG CRM-2 MGL-GAS	39	3*
CGL 008	Granite	MGT-1	54.59	1.11
CGL 012	Gabbro	MGR-T	59.87	4.58
CGL 120	Gold-bearing complex ore	AHMH-1	65.29	12.54
CGL 009	Andesite	MGL-AND	71.5	4.20*
CGL 015	Nepheline syenite	HNS	75.42	4.30
CGL 010	Zeolite, spiked	MGL-ZEO-S	79.3	3.5*
IAG/CGL 019	Trachyandesite	MTA-1	89	3*
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	92	6*
CGL 011	Diorite	MDR	92.77	6.06
CGL 006	Nepheline syenite	LNS	98	6
CGL 013	Gabbro	MGR-N	98	49
CGL 007	Basalt	MBL-1	114	3
CGL 014	Basalt	MBL-D	133	9.6
CGL 123	Gold-copper ore	OTH	136	6
IAG/CGL 018	Rhyolite	MRH-1	161	6*
CGL 112	Tungsten-molybdenum ore	WMo	0.017%	0.003%
CGL 003	Graphite	BJBCh	0.018%	0.004%
CGL 127	Manganese ore	MnH	182	8*
CGL 119	Chromium ore	HHH	0.023%	0.016%
CGL 022	Greisen	MGn	273	11*
CGL 124	Rare-earth ore	TRLK	469	21
CGL 129	Titanium ore	TiH	575	19*
CGL 128	Lithium ore	MLiH	594	19*
CGL 111	Rare-earth ore	TRM-2	0.06%	0.004%
CGL 106	Silver ore	RS-3	0.20%	0.01%
CGL 104	Silver ore	RS-1	0.42%	0.01%
CGL 105	Silver ore	RS-2	0.59%	0.01%
CGL 108	Silver-bearing complex ore	TsAg	8.72%	0.166%
CGL 207	Zinc concentrate	MZnB	49.14%	0.84*%

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, mg/kg	Confidence interval, mg/kg
Zr	**Zirconium**			
CGL 129	Titanium ore	TiH	35.4	3.7*
CGL 002	Alkaline granite	IAG CRM-3 MGL-OShBO	40.1	2.8*
CGL 128	Lithium ore	MLiH	69.94	11.45*
CGL 123	Gold-copper ore	OTH	78.3	11.1
CGL 003	Graphite	BJBCh	120	20
CGL 009	Andesite	MGL-AND	141	11*
CGL 022	Greisen	MGn	148	6*
CGL 015	Nepheline syenite	HNS	157	7.73
CGL 008	Granite	MGT-1	169	2.92
CGL 112	Tungsten-molybdenum ore	WMo	170	10
CGL 010	Zeolite, spiked	MGL-ZEO-S	177	20*
CGL 011	Diorite	MDR	191	43
CGL 014	Basalt	MBL-D	201	2.8
CGL 127	Manganese ore	MnH	208	11*
CGL 007	Basalt	MBL-1	287	5
IAG/CGL 019	Trachyandesite	MTA-1	368	12*
IAG/CGL 018	Rhyolite	MRH-1	471	11*
CGL 006	Nepheline syenite	LNS	600	145

*-measurement uncertainty

Table 3 (continued)

CGL code	Description	Designation	Certified value, %	Confidence interval, %
A^d	dry **Ash**			**%**
CGL 402	Hard coal	SOEN	6.27	0.11
CGL 401	Brown coal	BNN	9.04	0.20
CGL 403	Coking coal	TTKN	15.17	0.35
V^{daf}	**Volatile** dry ash-free			
CGL 403	Coking coal	TTKN	29.29	0.42
CGL 402	Hard coal	SOEN	44.82	0.45
CGL 401	Brown coal	BNN	46.28	1.70

CGL code	Description	Designation	Certified value, MJ/kg	Confidence interval, MJ/kg
Q^{daf}	**Calorific value** dry ash-free			
CGL 401	Brown coal	BNN	28.95	0.57
CGL 402	Hard coal	SOEN	32.16	0.27
CGL 403	Coking coal	TTKN	35.26	0.22