GEOPT14 - AN INTERNATIONAL PROFICIENCY TEST FOR ANALYTICAL GEOCHEMISTRY LABORATORIES - REPORT ON ROUND 14 / January 2004 (OShBO - alkaline granite)

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Abstract

Results are presented for GeoPT14, round fourteen of the GeoPT international proficiency testing programme for analytical geochemistry laboratories. The sample distributed for this round was OShBO, an alkaline granite sample collected and prepared as a candidate reference material by Central Geological Laboratories, Mongolia. In this report, contributed data are listed, together with an assessment of assigned values, z-scores and charts showing both the distribution of contributed results and the overall performance of participating laboratories.

Introduction

This fourteenth round of the international proficiency testing programme, GeoPT14, was conducted in a similar manner to earlier rounds. The programme is designed to be part of the routine quality assurance scheme of analytical geochemistry laboratories. The trial involves distributing a sample of established homogeneity to participating laboratories, which are required to analyse the sample using a well-characterised technique or techniques operated under routine analytical conditions. Results are then tabulated by the organisers and z-scores calculated by comparing each analysed result submitted with the value assigned to be the best estimate of the true composition. These assigned values were estimated by robust statistical analysis of all the contributed data. By examining the magnitude of the z-score, participating laboratories can decide whether the quality of their data is satisfactory in relation to both their chosen fitness-for-purpose criteria and results submitted by all the other laboratories contributing to the round, and choose to take corrective action if this appears justified.

Full details of the programme have been included in reports of previous rounds, the current publication status of which is listed in Appendix 1. More specifically, the procedures followed in this round comply with the protocol published for conducting the GeoPT series of proficiency tests (see www.geoanalyst.org). In this report, therefore, only the features of the present round are included and readers interested in further details are invited to review the GeoPT protocol and previously published reports.

Steering Committee for Round 13: M. Thompson (Chair), P.J. Potts (Secretary), S.R.N. Chenery, P.C. Webb and B. Batjargal.

Sample: The alkaline granite sample (OShBO) used in GeoPT14 was collected and prepared as a candidate reference material by the Central Geological Laboratory, Ulaanbaatar, Mongolia. The sample was tested for homogeneity by selecting at random ten packets of the sample prepared for distribution. Duplicate test portions from each packet were analysed by WD-XRF at the OU. For the elements for which values could be assigned, homogeneity was considered to be satisfactory for use in the GeoPT14 round. An analysis of the results with additional comments is listed in Appendix 2.

Timetable for GeoPT13:
Distribution of sample: September 2003.
Deadline for submission of analytical results: 15th November 2003.
Distribution of draft report: January 2004

Submission of results
Results submitted by the seventy-eight laboratories that participated in this round are listed in Table 1. All these data were used for the assessment of assigned values.

Assigned values
Following procedures described in earlier rounds, a robust statistical procedure was used to derive assigned value concentrations [X_a], these being judged to be the best estimates of the true composition of this sample. Data in Table 2 lists assigned values for 8 majors and 38 trace elements. Values were assigned on the basis that: (i) sufficient laboratories had contributed data for an element, (ii) the statistical assessment gave confidence that the results showed a central portion approximating to a normal distribution. Part of this assessment involved examining a bar chart for each element to judge the distribution of results. Bar charts for elements shown in Figure 1 were judged to have satisfactory distributions, namely: SiO_2, Al_2O_3, Fe_2O_3T, MnO, CaO, Na_2O, K_2O, LOI*, Ba*, Be*, Bi*, Ce, Cr, Cs, Cu*, Dy, Er, Eu*, Ga, Gd, Hf, Ho, La, Lu, Nb, Nd, Ni*, Pb, Pr, Rb, Sb, Sc, Sm, Sn*, Sr, Ta*, Tb, Th, Tl*, Tm, U, W*, Y*, Yb, Zn and Zr.

The elements marked with a * are judged to have provisional assigned values, principally because data distributions plotted in Figure 1 possess some degree of asymmetry.

Charts in Figure 2 show distribution data for elements that were not judged to be sufficiently satisfactory in the statistical analysis to assign values. In the present round, values could not be assigned to the following elements, despite the availability of sufficient analytical results:
TiO_2, FeO, MgO, P_2O_5, H_2O^+, CO_2*, As*, Cd*, Co*, F*, Ge*, Li*, Mo* and V*.
The elements marked with a * are presented in Figure 2 with guidance values. There is some degree of consensus in results reported for these elements to provide some guidance to contributing laboratories. However, these data must be interpreted with caution.

For other elements that are not included in either of these two lists, insufficient data was reported to allow any assessment to be made.

The most common reasons for elements failing the assessment of assigned values were as follows:

(i) Insufficient number of contributed results.
(ii) Results showing a strong positive skew in the frequency distribution diagram, sometimes with an indication of multi-modality.
(iii) A robust mean clearly different from the mode, which makes the determination of a consensus impracticable.

(iv) A very wide distribution of results as judged by the robust standard deviation value so that no matter where the consensus was placed, most of the participants would receive an 'unsatisfactory' classification if z-scores were calculated.

Z-score analysis

As in previous rounds, laboratories were invited to choose one of two performance standards against which their analytical results would be judged:

Data quality 1 for laboratories working to a 'pure geochemistry' standard of performance, where analytical results are designed for geochemical research and where care is taken to provide data of high precision and accuracy, sometimes at the expense of a reduced sample throughput rate.

Data quality 2 for laboratories working to an 'applied geochemistry' standard of performance, where, although precision and accuracy are still important, the main objective is to provide results on large numbers of samples collected as part of geochemical mapping projects or geochemical exploration programmes.

The target standard deviation (H_a) for each element assessed was calculated from a modified form of the Horwitz function as follows:

$$H_a = k.X_a^{0.8495}$$

Where X_a is the concentration of the element expressed as a *fraction*, and the factor k = 0.01 for pure geochemistry labs and k = 0.02 for applied geochemistry labs.

Z-scores were calculated for each elemental result submitted by each laboratory from:

$$z = [X - X_a] / H_a$$

where:

X is the contributed result, X_a is the assigned value and H_a is the target standard deviation.

Z-score results are listed in Table 3 and participating laboratories are invited to assess their performance using the following criterion:

Z-score results in the range $-2<z<2$ are considered to be 'satisfactory' (in the sense that no action is called for by the participant). If the z-score for any element falls outside this range, contributing laboratories are advised to examine their procedures to ensure that determinations are not subject to unsuspected analytical bias.

Overall performance

A summary of the overall performance of individual laboratories in this round is plotted in Figure 3 as a multiple z-score chart. In this chart, the z-score performance for each element is distinguished by symbols that make it simple to identify whether the results were satisfactory or gave z-scores that exceeded the action limits. This chart is designed to help individual laboratories to judge their overall performance in this proficiency testing round.

Participation in future rounds

The benefit from proficiency testing arises from regular participation and laboratories are invited to contribute to the GeoPT15 round, the sample for which will be distributed during March 2004.

Acknowledgments

The authors thank Jann Matela and Liz Lomas (OU) for valued assistance with the production of this report. The GeoPT programme is organised on behalf of the International Association of Geoanalysts.

Appendix 1

Publication status of proficiency testing reports

GeoPT1
Thompson M., Potts P.J., Kane J.S. and Webb P.C. (1996)
GeoPT1. International proficiency test for analytical geochemistry laboratories - Report on round 1. Geostandards Newsletter: The Journal of Geostandards and Geoanalysis, 20, 295-325.

GeoPT2
Thompson M., Potts P.J., Kane J.S., Webb P.C. and Watson, J.S. (1998)
GeoPT2. International proficiency test for analytical geochemistry laboratories - Report on round 2. Geostandards Newsletter: The Journal of Geostandards and Geoanalysis, 22 127-156.

GeoPT3
Thompson M., Potts P.J., Kane J.S. and Chappell B.W. (1999a)
GeoPT3. International proficiency test for analytical geochemistry laboratories - Report on round 3. Geostandards Newsletter: The Journal of Geostandards and Geoanalysis, 23, 87-121.

GeoPT4
Thompson M., Potts P.J., Kane J.S., Webb P.C. and Watson J.S. (1999b)
GeoPT4. International proficiency test for analytical geochemistry laboratories - Report on round 4. Published in the electronic version of Geostandards Newsletter: The Journal of Geostandards and Geoanalysis (Summer 2000).

GeoPT5
Thompson M., Potts P.J., Kane J.S., and Wilson S. (1999c)
GeoPT5. International proficiency test for analytical geochemistry laboratories - Report on round 5. Published in the electronic version of Geostandards Newsletter: The Journal of Geostandards and Geoanalysis (Summer 2000).

GeoPT6
Potts P.J., Thompson M., Kane J.S., Webb P.C. and Carignan J. (2000)
GEOPT6 - an international proficiency test for analytical geochemistry laboratories - report on round 6 (OU-3: Nanhoron microgranite) and 6A (CAL-S: CRPG limestone). International Association of Geoanalysts: Unpublished report.

GeoPT7
Potts P.J., Thompson M., Kane J.S., and Petrov L.L. (2000)
GEOPT7 - an international proficiency test for analytical geochemistry laboratories - report on round 7 (GBPG-1 Garnet-biotite plagiogneiss). International Association of Geoanalysts: Unpublished report.

GeoPT8
Potts P.J., Thompson M., Kane J.S., Webb, P.C. and Watson J.S. (2000)
GEOPT8 - an international proficiency test for analytical geochemistry laboratories - report on round 8 / February 2001 (OU-4 Penmaenmawr microdiorite). International Association of Geoanalysts: Unpublished report.

GeoPT9
Potts P.J., Thompson M., Webb, P.C. and Watson J.S. (2001)
GEOPT9 - an international proficiency test for analytical geochemistry laboratories - report on round 9 / July 2001 (OU-6 Penrhyn slate). International Association of Geoanalysts: Unpublished report.

GeoPT10
Potts P.J., Thompson M., Webb, P.C., Watson J.S. and Wang Yimin (2001)
GEOPT10 - an international proficiency test for analytical geochemistry laboratories - report on round 10 / December 2001 (CH-1 Marine sediment). International Association of Geoanalysts: Unpublished report.

GeoPT11
Potts P.J., Thompson M., S.R. Chenery, Webb, P.C. and Watson J.S. (2002)
GEOPT11 - an international proficiency test for analytical geochemistry laboratories - report on round 11 / July 2002 (OU-5 Leaton dolerite). International Association of Geoanalysts: Unpublished report.

GeoPT12
Potts P.J., Thompson M., S.R. Chenery, Webb, P.C. and B. Batjargal (2003)
GEOPT12 - an international proficiency test for analytical geochemistry laboratories - report on round 12 / January 2003 (GAS Serpentinite). International Association of Geoanalysts: Unpublished report.

GeoPT13
Potts P.J., Thompson M., S.R. Chenery, Webb, P.C. and H.U. Kaspar (2003)
GEOPT13 - an international proficiency test for analytical geochemistry laboratories - report on round 13 / July 2003 (Köln Loess). International Association of Geoanalysts: Unpublished report.

Table 1: GeoPT14

Results submitted (Nov 2003) by laboratories to the GeoPT14 round for OShBO (alkaline granite).

Round identifier		O1	O2	O2	O3	O4	O4	O5	O6	O6	O7	O7	O8	O9	O10	O11
Sample		OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO
Technique codes		X	ISE,X	ISE,X	IR,X	M	M	X	X	X	I	I	A,M	I	AA,T,M,X	M
Test portion (g)		5	0.5	0.5	0.7-1	0.1	0.1	1.5	0.7	10	1	10	0.1	0.4	0.1-0.75	0.1
Data quality		2	1	2	2	1	2	2	1	2	1	2	2	1	1	2
SiO2	% m/m	71.3	71.7		71.384			72.63	71.564				72		71.945	
TiO2	% m/m	0.02			0.010				0.012				0.006		0.017	
Al2O3	% m/m	17	16		15.967			16.16	16.069				15.9	15.57	15.81	
Fe2O3	% m/m	0.75	0.47		0.330			0.485	0.716			0.486	0.6	0.49	0.509	
Fe(II)O	% m/m														0.84	
MnO	% m/m	0.19	0.16		0.156			0.157	0.161				0.158	0.16	0.149	
MgO	% m/m	0.05			0.066				0.035				0.02		0.017	
CaO	% m/m	0.47	0.37		0.357			0.38	0.402				0.41		0.387	
Na2O	% m/m	6.2	5.55		5.428			5.41	5.516			5.77	5.23	5.45	5.42	
K2O	% m/m	3.9	3.54		3.625			3.62	3.552			3.95	3.59	3.9	3.532	
P2O5	% m/m	0.04			0.031			0.028	0.023				0.03		0.009	
H2O+	% m/m															
CO2	% m/m															
LOI	% m/m		1.11		0.895			1.09	1.07				1.16		0.95	
Ag	mg kg-1															
As	mg kg-1									5.1		2.52		2.4		
Au	mg kg-1													0.006		
B	mg kg-1															
Ba	mg kg-1					11.59				27.2			13.2		11.16	12.5
Be	mg kg-1															64.1
Bi	mg kg-1															
Br	mg kg-1															
Cd	mg kg-1															0.18
Ce	mg kg-1					29.01					26.1		27	26	26.58	17.25
Cl	mg kg-1															
Co	mg kg-1									1			1	1.6	0.484	0.55
Cr	mg kg-1				183					134.2		207	176	193	197	
Cs	mg kg-1					75.78						81.1	71	81	73.15	102
Cu	mg kg-1								6.6				15		5.41	
Dy	mg kg-1					4.382							4	4.1	4.45	3.95
Er	mg kg-1					1.85							1.5		1.765	1.69
Eu	mg kg-1					0.0275					0.16		0.02		0.027	0.03
F	mg kg-1			11900												
Ga	mg kg-1									52.3					53.8	54.4
Gd	mg kg-1					4.13							3.3		4.153	3.81
Ge	mg kg-1															2.88
Hf	mg kg-1						7.946					7.33	7.1	8.1	7.5	8.48
Hg	mg kg-1															
Ho	mg kg-1					0.6607					1.13		0.64		0.655	0.65
I	mg kg-1															
In	mg kg-1															
Ir	mg kg-1															
La	mg kg-1					8.64					8.42		8.1	8.3	7.66	5.95
Li	mg kg-1															2582
Lu	mg kg-1					0.33					0.3		0.3	0.31	0.341	0.33
Mo	mg kg-1												0.4			
N	mg kg-1															
Nb	mg kg-1								57.8				58.1		68.64	38.1
Nd	mg kg-1					15.79					19.4		15.2	18	15.3	34.3
Ni	mg kg-1								12.8				15.6		12.97	14
Os	mg kg-1															
Pb	mg kg-1					63			70.2						64.94	78.5
Pd	mg kg-1															
Pr	mg kg-1					4.54							4.23		4.312	4.31
Pt	mg kg-1															
Rb	mg kg-1	3400				2613			2333			2332	2151	2665	2263	2374
Re	mg kg-1															
Rh	mg kg-1															
Ru	mg kg-1															
S	mg kg-1									31.2						
Sb	mg kg-1											0.74	0.5	1.1		0.41
Sc	mg kg-1									4.7		9.77	9.2	9.91	9.49	9.73
Se	mg kg-1											6				
Sm	mg kg-1					6.128					5.98		5.9	6.79	6.083	5.75
Sn	mg kg-1												47			
Sr	mg kg-1					12.82			13.8				13.6		12.94	14.4
Ta	mg kg-1											52.3	45	58.5	47.18	
Tb	mg kg-1					0.8082					0.91		0.68	0.83	0.82	0.7
Te	mg kg-1											5				
Th	mg kg-1					12.92				21.7		14.4	11.8	15.9	12.5	12.3
Tl	mg kg-1															16.5
Tm	mg kg-1												0.32		0.331	0.32
U	mg kg-1					3.643				4		3.3	3.5	4.2	3.657	3.54
V	mg kg-1									3.8			1.6		1.221	5.91
W	mg kg-1											3.91	4.3			
Y	mg kg-1					23.04			8.5				22		25.07	22.3
Yb	mg kg-1					2.424					2.32		2.06	2.36	2.368	2.28
Zn	mg kg-1								90.8				79		79.97	
Zr	mg kg-1						41.03		42.3				37		39.54	

Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric; I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other; S=spectrophotometry, T=titrimetry; W=wet chemistry; X=X-ray fluorescence.

Results L80 to L83 were submitted too late to contribute to the assessment of assigned values.

Table 1: GeoPT14

Results submitted (Nov 2003) by laboratories to the GeoPT14 round for OShBO (alkaline granite).

Round identifier		O12	O13	O14	O15	O15	O16	O17	O18	O19	O20	O21	O21	O22	O23	O24
Sample		OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO
Technique codes		X	X	IR,T,X	A,AA,M,X	A,AA,M,X	AA,C	X	X	I	V,X	X	X	AA,A,ISE,X	X	M,X
Test portion (g)		0.6-5.4	1	0.1-0.8	0.1-8	0.1-8	0.1-1	0.7-5	0.5-5	0.15	0.5-7	1	4.5	0.2-3	0.28-6	0.06-1
Data quality		2	2	2	1	2	2	2	1	1	2	1	2	1	1	1
SiO2	% m/m	72.4	71.35	72.09	72.90		52.74	72.12	71.91		71.976	72.82		71.27	71.08	72.32
TiO2	% m/m	0.0113	0.013				0.02		0.02		0.004	0.01		0.035	0.06	
Al2O3	% m/m	16.09	14.8	16.09	15.74		0.51	16.06	16.19		16.186	16.27		15.59	17	16.66
Fe2O3	% m/m	0.4354	2	0.47	0.509		0.65	0.48	0.23	0.43	0.55	0.48		0.46	0.53	0.69
Fe(II)O	% m/m			0.35							0.49			0.37		
MnO	% m/m	0.1607	0.154	0.159	0.159		0.08	0.16	0.16		0.133	0.17		0.162	0.16	0.17
MgO	% m/m	0.0276	0.15				0.001		0.19		0.11			0.03		0.05
CaO	% m/m	0.3928	0.525	0.41	0.414		0.01	0.38	0.45		0.4	0.39		0.38	0.39	0.37
Na2O	% m/m	5.534	5.04	5.41	5.419		21.43	5.51	5.56	5.53	5.397	5.51		5.55	5.92	5.77
K2O	% m/m	3.525	3.67	3.57	3.793		3.55	3.55	3.52		3.577	3.63		3.65	3.41	3.57
P2O5	% m/m	0.0271	0.02	0.03	0.018			0.02	0.03		0.025	0.02		0.015	0.06	
H2O+	% m/m		0.065											1.07		
CO2	% m/m			0.355										0.23		
LOI	% m/m	0.895	0.97	1.2	1.07		1.43	1.09	1.03		1.03	1.13		1.17	1.17	1.48
Ag	mg kg-1															
As	mg kg-1							3		2.1				0.96		
Au	mg kg-1									0.0024						
B	mg kg-1															
Ba	mg kg-1	15.1				13					109	40.7			62	11.19
Be	mg kg-1					40								66.6		70.7
Bi	mg kg-1							67						19		
Br	mg kg-1															
Cd	mg kg-1															
Ce	mg kg-1	23.2				22				33				28.5		27.33
Cl	mg kg-1															
Co	mg kg-1						0.73	5		0.6					2	0.9
Cr	mg kg-1	222.7		195		160	139.45	165	219	230	278	223		190	214	200
Cs	mg kg-1	77.9								71.2						78.2
Cu	mg kg-1					5	4.75				6	1.9		6.5	2	4
Dy	mg kg-1				5.4									4.54		4.4
Er	mg kg-1				2.3									1.85		1.79
Eu	mg kg-1				0.21					0.05				0.31		0.01
F	mg kg-1													13490		
Ga	mg kg-1	50.8		54.6								59.3				49.7
Gd	mg kg-1				5.3									4.45		3.77
Ge	mg kg-1															
Hf	mg kg-1									8.3						7.86
Hg	mg kg-1													0.013		
Ho	mg kg-1				0.87											0.68
I	mg kg-1															
In	mg kg-1															
Ir	mg kg-1															
La	mg kg-1			15.2		8				8.2				8.05		7.87
Li	mg kg-1													1742		
Lu	mg kg-1				0.45									0.3		0.33
Mo	mg kg-1									1.2						
N	mg kg-1															
Nb	mg kg-1	53.7		57.6		60			62		62	63.8		61.5	63	65.5
Nd	mg kg-1			10.6	17.9					21				15.7		15.65
Ni	mg kg-1	29.6		13.8		14	14.72	28		13	70.5	25.1			20	13
Os	mg kg-1															
Pb	mg kg-1	72		64.5		49	24.55	73	65		83	64		63		29.3
Pd	mg kg-1															
Pr	mg kg-1				4.9									4.6		4.31
Pt	mg kg-1															
Rb	mg kg-1	2439		2405		2530		2620		2274	2430	2289		2287	2321	2112
Re	mg kg-1															
Rh	mg kg-1															
Ru	mg kg-1															
S	mg kg-1															
Sb	mg kg-1									0.45				0.53		
Sc	mg kg-1					5				8.1		9.5				15.1
Se	mg kg-1															
Sm	mg kg-1				7.4					6.1				5.91		5.99
Sn	mg kg-1	43.4												49		
Sr	mg kg-1	12.5		13.2		16			9		24	13.5		17	8	13.92
Ta	mg kg-1									48.7						46
Tb	mg kg-1				1.1					0.63						0.83
Te	mg kg-1															
Th	mg kg-1	34.1		12.4				12		13.3	23			13		4.95
Tl	mg kg-1															7.5
Tm	mg kg-1				0.45											0.33
U	mg kg-1							8		3.85			5.2	9		1.44
V	mg kg-1			12.8							2.5	3			2	1.1
W	mg kg-1					9				4.5						
Y	mg kg-1			28.5		19		465				29.2		22.9		25.45
Yb	mg kg-1				3.05					2.8				2.5	32	2.33
Zn	mg kg-1	90.4		91.2		88	415.4	94	93	66	101			95	37	
Zr	mg kg-1	47.8		34.7		71			40		44	43.8		34	63	39.2

Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric; I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other; S=spectrophotometry, T=titrimetry; W=wet chemistry; X=X-ray fluorescence.

Results L80 to L83 were submitted too late to contribute to the assessment of assigned values.

Table 1: GeoPT14

Results submitted (Nov 2003) by laboratories to the GeoPT14 round for OShBO (alkaline granite).

Round identifier		O25	O26	O27	O28	O29	O29	O30	O30	O31	O32	O32	O33	O34	O35	O36
Sample		OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO
Technique codes		X	X	A,IR,M,X	X	T,X	X	X	X	X	X	X	M	M,X	A,ir,ISE, M,V	X
Test portion (g)		0.002-0.7	1	0.2-7	0.6	0.36-6	6	6-0.6	6-0.6	1.5	1.0-9	1.0-9	0.1	0.1-10	0.2-0.3	1.0-5
Data quality		2	2	2	1	1	2	1	2	2	1	2	1	1	2	2
SiO2	% m/m	68.6	73.8	72.6	72.798	72.06		71.1		71.83	71.76			71.58	72.4	71.954
TiO2	% m/m		-	0.005		0.012		0.01			0.012			0.0056	0.006	0.01
Al2O3	% m/m	13.2	15.8	16	15.964	16.123		15.85		16.07	16.23			15.98	15.6	16.089
Fe2O3	% m/m	0.403	0.49	0.43	0.472	0.442		0.45		0.43	0.47			0.462	0.5	0.475
Fe(II)O	% m/m		-			0.37									0.44	
MnO	% m/m	0.138	0.16	0.159	0.165	0.158		0.16		0.05	0.153			0.154	0.165	0.158
MgO	% m/m		-			0.022		0.01			0.03			0.0134	0.014	0
CaO	% m/m	0.37	0.39	0.383	0.372	0.395		0.43		0.4	0.4			0.375	0.402	0.363
Na2O	% m/m		5.40	5.54	5.461	5.528		5.38		5.51	5.43			5.38	5.43	5.516
K2O	% m/m	3.16	3.57	3.52	3.575	3.623		3.4		3.68	3.62			3.58	3.65	3.616
P2O5	% m/m		-	0.018		0.023		0.03			0.024			0.023	0.025	0.02
H2O+	% m/m		-	0.09												
CO2	% m/m		-	0.25											0.16	
LOI	% m/m		1.08	1	0.917	0.99		1.14		1.06	1.03			1.19	1.2	1.145
Ag	mg kg-1													0.16		
As	mg kg-1			1.29						1					1.9	1.3
Au	mg kg-1															
B	mg kg-1															
Ba	mg kg-1	10		14.3		11		80		9		30	11.7	12.37	11.6	34.3
Be	mg kg-1			61.6						45			66.8	71.9	59.5	
Bi	mg kg-1	23		19.8						15			24.6	22.8	25.2	
Br	mg kg-1															
Cd	mg kg-1	4.5												0.05		
Ce	mg kg-1	25		24.2			29		25	25		39.1	25.2	26.63	29.7	25.7
Cl	mg kg-1															
Co	mg kg-1			0.56									0.99	0.53	0.5	
Cr	mg kg-1	170		142		232.5		207		140	182.6		160	212	220	221.3
Cs	mg kg-1	81		63.3					49			86.1	75.9	75.7	79.2	
Cu	mg kg-1	18		4.47		4.2			27		9		2.95	4	7	5
Dy	mg kg-1			3.7									3.84	4.54	4.8	
Er	mg kg-1			1.43									1.6	1.89	1.8	
Eu	mg kg-1												0.022	0.031	0.03	
F	mg kg-1			12300				9500				0.56			12530	
Ga	mg kg-1	78		44.5							70.5		41.8	57.3	57.6	51.7
Gd	mg kg-1			3.67									3.46	4.21	4.3	
Ge	mg kg-1	8.5		7.19									7.25		7	
Hf	mg kg-1			6.68					4				8.08	8.56	8.7	
Hg	mg kg-1															
Ho	mg kg-1			0.54									0.59	0.671	0.73	
I	mg kg-1															
In	mg kg-1												0.27		0.26	
Ir	mg kg-1															
La	mg kg-1	7		7.24			21					26.6	7.21	8.23	8.8	35.7
Li	mg kg-1												1391	1584	1680	
Lu	mg kg-1			0.29									0.273	0.33	0.37	
Mo	mg kg-1												0.45	0.354	0.4	
N	mg kg-1															
Nb	mg kg-1	51		65		59.6		52			60.8		59.3	60.7	77	63.7
Nd	mg kg-1	14		14.1					14	10		21.1	14.2	15.4	15.5	
Ni	mg kg-1	13		11.3		23.7			18	30	35		12.8	18.2	15	8.7
Os	mg kg-1															
Pb	mg kg-1	45		53.5		61		75		20	55.5		66.9	68.1	68	65
Pd	mg kg-1															
Pr	mg kg-1	2		3.54									4.17	4.31	4.72	
Pt	mg kg-1															
Rb	mg kg-1	2220		2367		2487.1		2125			2400		1546	2435	2480	2325.3
Re	mg kg-1															
Rh	mg kg-1															
Ru	mg kg-1															
S	mg kg-1															
Sb	mg kg-1			0.38									0.42	0.386	0.42	
Sc	mg kg-1			9.61									13.4	9.49	9	8.3
Se	mg kg-1															
Sm	mg kg-1			5.01									5.59	6.04	6.2	
Sn	mg kg-1			39.1					44	40				41.8	56	
Sr	mg kg-1	9		10.9		17.1			10	10	12.1		11.2	13.4	13	13.3
Ta	mg kg-1			43.9									43.9	35.3	54.8	
Tb	mg kg-1			0.69									0.69	0.82	0.88	
Te	mg kg-1													0.26		
Th	mg kg-1			11.1					18		13.6		13.3	13	13.5	9
Tl	mg kg-1			12.2									16.1	15.5	16.2	
Tm	mg kg-1			0.29									0.28	0.324	0.34	
U	mg kg-1			3.4							2.8		3.9	3.76	4.2	0
V	mg kg-1			1.19		3.5							2.04	1.9	1	0
W	mg kg-1												5.06	4.36	5.5	
Y	mg kg-1	25		21.9		8.8			23		211		17.4	23.5	24.8	34.7
Yb	mg kg-1			2.04						20			2.16	2.37	2.5	
Zn	mg kg-1	86		102	0.017	92.9		81		70	97.5		87.2	90.9	99	90.3
Zr	mg kg-1	30		35.8		44.6			43	80	29.4		39.5	39.8	47	0

Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;
I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;
S=spectrophotometry, T=titrimetry; W=wet chemistry; X=X-ray fluorescence.
Results L80 to L83 were submitted too late to contribute to the assessment of assigned values.

		Table 1: GeoPT14														
		Results submitted (Nov 2003) by laboratories to the GeoPT14 round for OShBO (alkaline granite).														
Round identifier		O37	O38	O39	O40	O41	O42	O43	O43	O44	O45	O46	O47	O48	O49	O50
Sample		OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO
Technique codes		A	A,ir,M,X	X	X	A	AA,ISE, W,X	I	I	X	A,M	X	M,X	I	X	X
Test portion (g)		0.05	0.25-2.0	0.3	0.4-5	0.1-0.8	0.5-10	0.21	0.21	0.4	0.25	1.0-7	0.125-3.5	0.04	1.0-10	1.0-20
Data quality		1	2	2	2	2	2	1	2	2	2	1	1	2	2	1
SiO2	% m/m	72.6	72.6		71.02	69	71.11		72.95	71.87	71.36	72.57	72.227		71.954	71.81
TiO2	% m/m	0.0059	0.01		0.009	0.006					0.02	0.014	0.008		0.01	
Al2O3	% m/m	15.806	16.3		15.89	15	15.42	16.72		16.14	15.94	16.1	16.215		16.089	16.01
Fe2O3	% m/m	0.484	0.47		0.18	0.28	0.51	0.45		0.45	0.508	0.48	0.46	0.494	0.475	0.39
Fe(II)O	% m/m		0.07													
MnO	% m/m	0.155	0.15		0.178	0.15	0.161	0.16		0.16	0.164	0.158	0.1637		0.158	0.16
MgO	% m/m	0.015	<0,2		0.01	0.015					0.144	0.03	0.04		0	
CaO	% m/m	0.409	0.4		0.39	0.34	0.31			0.36	0.443	0.39	0.419		0.363	0.27
Na2O	% m/m	5.4	5.6		5.37	5.6	4.77	5.61		7.27	5.375	5.34	5.461	5.39	5.516	5.57
K2O	% m/m	3.54	3.56	15.2	3.58	4.7	3.65	3.83		3.55	3.527	3.57	3.614	3.35	3.616	3.67
P2O5	% m/m		0.03		0.019	0.014	0.03				0.031	0.029	0.027		0.02	0.05
H2O+	% m/m												0.017			
CO2	% m/m		0.22													
LOI	% m/m	1.127	1		0.86		1.14					1.09	1.06		1.145	1.1
Ag	mg kg-1															
As	mg kg-1					<			2.35						1.3	
Au	mg kg-1															
B	mg kg-1															
Ba	mg kg-1		11		20	9.1					15.5	29.5	13.7		34.3	
Be	mg kg-1		61			44					58.5					
Bi	mg kg-1		36			13.4	17									
Br	mg kg-1															
Cd	mg kg-1						0.04									
Ce	mg kg-1		22.6			13.3		31.1			26.14		27.31	27.5	25.7	
Cl	mg kg-1															
Co	mg kg-1								0.41		0.41			1.15		
Cr	mg kg-1		184		230	194	206	202			198.3	200.9	182.7	190	221.3	170
Cs	mg kg-1		72					73.6			90.08		75.202	72.1		
Cu	mg kg-1		8			4.7	5.41					8.5	6		5	4
Dy	mg kg-1		2.4					4.54			4.17		4.811			
Er	mg kg-1		1.1								1.83		1.881			
Eu	mg kg-1		< 0,1								0.02		0.036	0.14		
F	mg kg-1		10400		19800		12660									
Ga	mg kg-1		52				54		59.1		51.83	53.6	54.9		51.7	54
Gd	mg kg-1		2.7								3.72		4.316			
Ge	mg kg-1		1				4									
Hf	mg kg-1		7.1					7.91			8		7.879	8.12		
Hg	mg kg-1						0.004									
Ho	mg kg-1		0.4								0.69		0.724			
I	mg kg-1															
In	mg kg-1							0.26								
Ir	mg kg-1															
La	mg kg-1		5.9			4.2		8.41			7.67		8.621	9.26	35.7	
Li	mg kg-1		1757													
Lu	mg kg-1		0.2					0.32			0.31		0.343	0.342		
Mo	mg kg-1										0.28	1.7				
N	mg kg-1															
Nb	mg kg-1		108			56	54				63.5	71.9	65.973		63.7	56
Nd	mg kg-1		11.4			8.8			17.8		15		14.574	16.4		
Ni	mg kg-1		25		11		40				12.7	11.9	0		8.7	22
Os	mg kg-1															
Pb	mg kg-1		64			36	60				51.81	75.2	67.201		65	59
Pd	mg kg-1															
Pr	mg kg-1		2.5								4.23		4.082			
Pt	mg kg-1															
Rb	mg kg-1		2400	7100	2310		2492	2260			2713.2	2421.4	2622.4	2360	2325.3	2342
Re	mg kg-1															
Rh	mg kg-1															
Ru	mg kg-1															
S	mg kg-1		< 100			22										
Sb	mg kg-1					3.6										
Sc	mg kg-1		2			6.3		9.83			8.7		11.29	9.55	8.3	12
Se	mg kg-1															
Sm	mg kg-1		4					6.55			5.79		6.445	6.16		
Sn	mg kg-1		27			8.6	60				46.45					
Sr	mg kg-1		21		11	9.1						12.1	15		13.3	13
Ta	mg kg-1		32					41.6			51.01		48.235	44.2		
Tb	mg kg-1		0.4					0.77			0.78		0.897	0.835		
Te	mg kg-1															
Th	mg kg-1		8.6					13			13.18	15	13.899	13.6	9	15
Tl	mg kg-1						14				13.13					
Tm	mg kg-1		0.2								0.31		0.334			
U	mg kg-1		3.4						2.48		3.73	7.4	3.704	3.66	0	7
V	mg kg-1					<						4	0		0	
W	mg kg-1								5.19							
Y	mg kg-1		11			15					25.6		25.783		34.7	58
Yb	mg kg-1		1.1			4.5		2.31			2.31		2.319	6.43		
Zn	mg kg-1		153		89	72	92	86.6			81.9	97.2	96.8	127	90.3	88
Zr	mg kg-1		39		35	32	38				27.55	41.6	37.5		0	40
		Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;														
		I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;														
		S=spectrophotometry, T=titrimetry; W=wet chemistry; X=X-ray fluorescence.														
		Results L80 to L83 were submitted too late to contribute to the assessment of assigned values.														

		Table 1: GeoPT14														
		Results submitted (Nov 2003) by laboratories to the GeoPT14 round for OShBO (alkaline granite).														
Round identifier		O50	O51	O52	O52	O53	O54	O55	O56	O57	O58	O58	O59	O60	O61	O61
Sample		OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO
Technique codes		X	A,M	AA,A,E,ISE.	AA,A,E,ISE.	X	A,M,O,X	M,X	AA,E,O,S,X	AA,O,T,X	X	X	A,M,X	X	M	M
Test portion (g)		20	0.2	0.1-0.5	0.1-0.5	0.18	0.05-0.5	0.1-5	0.06-5	0.01-0.7	0.12	0.12	0.05-4	1	0.1	0.1
Data quality		2	2	1	2	2	1	2	2	1	1	2	2	1	1	2
SiO2	% m/m						72.3	72.35	72.02	71.58	73.247		73.16	71.45		
TiO2	% m/m		0.0058			0.0073	0.0064			0		0.004		0.01	0.0489	
Al2O3	% m/m		13.1				16.05	16.17	17.797	15.92	16.266		16.09	16.4		
Fe2O3	% m/m		0.446			0.428	0.45	0.47	0.528	0.5	0.5		0.494	0.42		
Fe(II)O	% m/m								0.279	0.45						
MnO	% m/m		0.157			0.170	0.16	0.16	0.145	0.16	0.165		0.149	0.176		
MgO	% m/m		0.0128				0.011			0		0.006		0.05		
CaO	% m/m		0.371			0.798	0.47	0.41	0.345	0.38	0.393		0.436	0.38		
Na2O	% m/m		5.41	4.21			5.41	5.18	5.123	5.37	5.475		5.31	5.23		
K2O	% m/m		3.68	2.65		4.76	3.66	3.59	3.652	3.5	3.623		3.26	3.48		
P2O5	% m/m		0.016				0.019	0.03		0.01	0.024			0.04		
H2O+	% m/m									0.3						
CO2	% m/m															
LOI	% m/m						0.9	0.98	1.09	1.16			1.01	1.17		
Ag	mg kg-1		0.2		0.17											
As	mg kg-1		2.7				1.6			9						
Au	mg kg-1		1.4													
B	mg kg-1				3.25											
Ba	mg kg-1	1426	12.8				11.8	18		47						12.522
Be	mg kg-1		39		65		61.4		35							
Bi	mg kg-1					20	22.2			28						
Br	mg kg-1					4.1										
Cd	mg kg-1						0.05			0						
Ce	mg kg-1	138					22	26		2			23.85		27.851	
Cl	mg kg-1									34						
Co	mg kg-1		0.6		1.05		0.6			11						1.7819
Cr	mg kg-1		213		124	230	175		150	209			208		222.52	
Cs	mg kg-1		75.9	11			75.8			85					70.635	
Cu	mg kg-1		5.9		8.6	14.3	5.5		3.4	8						5.9846
Dy	mg kg-1						3.7	3.75		3			4.12			4.5302
Er	mg kg-1						1.6	1.56		2			1.675			1.8701
Eu	mg kg-1						0.033			3			0.0047			
F	mg kg-1								1.128	14268						
Ga	mg kg-1					72	53.3			57					59.614	
Gd	mg kg-1						3.1	3.59		18			3.99		4.0119	
Ge	mg kg-1				6.9	6.2										8.1039
Hf	mg kg-1				10		8.6			4					8.0352	
Hg	mg kg-1				0.0085		0.01									
Ho	mg kg-1						0.58	0.6		6			0.635		0.6431	
I	mg kg-1															
In	mg kg-1						0.21									
Ir	mg kg-1															
La	mg kg-1	35	6.2				6.5	7.77		23			6.88		8.8987	
Li	mg kg-1		1810	1300			1730		0.152	1796						
Lu	mg kg-1		0.37				0.31	0.31					0.325		0.3533	
Mo	mg kg-1		0.7		0.5		0.3			0			2.36			
N	mg kg-1															
Nb	mg kg-1				75		60	53	96	57			70.9		59.79	
Nd	mg kg-1						12.5	14.6		16			12.35			17.356
Ni	mg kg-1		15.7			14.5	14.1		15	15						30.499
Os	mg kg-1															
Pb	mg kg-1		66.5		64.2	73	58		88	68			68.1			63.293
Pd	mg kg-1															
Pr	mg kg-1						3.5	4.08		4			3.84		4.4463	
Pt	mg kg-1															
Rb	mg kg-1			1700		2390	2010	2287	0.228	2365			2433			2391
Re	mg kg-1															
Rh	mg kg-1															
Ru	mg kg-1															
S	mg kg-1									37						
Sb	mg kg-1		0.4				0.32			0						
Sc	mg kg-1		6.6		17		7.8		8	9						
Se	mg kg-1		2.4				0.056									
Sm	mg kg-1						5.1	5.4		6			5.26		6.1046	
Sn	mg kg-1		15.9		53		20	51	80	51						
Sr	mg kg-1		14.2			7.1	10			10			13.5			13.52
Ta	mg kg-1				100		42	53		64					41.905	
Tb	mg kg-1						0.68	0.72		1			0.79		0.794	
Te	mg kg-1		1.2													
Th	mg kg-1		12.2				11.1	19		24			19.16		12.805	
Tl	mg kg-1		14.9		16		15.1									
Tm	mg kg-1						0.28	0.3					0.315		0.3112	
U	mg kg-1		3				3.5			1			5.03		3.7607	
V	mg kg-1		1.5				5.6		3.3	7					3.3641	
W	mg kg-1		17				4.2			1					4.8878	
Y	mg kg-1		17.6				17.2	33	100	19			31.1		22.653	
Yb	mg kg-1						2.1	2.15		4			2.345			2.4593
Zn	mg kg-1		105		78	81	86		94	96						101.15
Zr	mg kg-1		53.3		40		45	38	36	35			42.1		38.974	
		Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;														
		I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;														
		S=spectrophotometry, T=titrimetry; W=wet chemistry; X=X-ray fluorescence.														
		Results L80 to L83 were submitted too late to contribute to the assessment of assigned values.														

		Table 1: GeoPT14														
		Results submitted (Nov 2003) by laboratories to the GeoPT14 round for OShBO (alkaline granite).														
Round identifier		O62	O63	O63	O64	O65	O66	O67	O68	O69	O70	O71	O72	O73	O74	O75
Sample		OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO
Technique codes		A,M,X	A,M,T,X	M,X	A,I,M,X	X	AA,A,M,X	A,M,X	X	AA,S,T,X	M,X	AA,G,S	X	A,M,X	-	A,AA,ir,T,X
Test portion (g)		0.1-12	0.1-7.5	0.1-1	0.2-3	0.8-12	0.1-2	0.2-0.25	10	0.1-5	0.25-0.6	0.004-0.1	0.18	0.1-2	-	0.1-4
Data quality		2	1	2	1	1	2	2	2	2	1	1	1	2	2	1
SiO2	% m/m	71.96	71.74		71.6	72.87	71	71		71.7	71.74	72.40	72.30	71.67	72.26	71.87
TiO2	% m/m	0.0139	0.012			0.009					0.01	0.045	0.047	0.02		0.01
Al2O3	% m/m	15.99	15.89		16.1	16.41	16.29	16.77		16.05	15.95	15.10	16.56	16.08	16.01	16
Fe2O3	% m/m	0.47	0.48		0.4867	0.483	0.38	0.44	0.52	0.49	0.43	0.48	0.014	0.3	0.458	0.48
Fe(II)O	% m/m		0.47				0.26			0.3						
MnO	% m/m	0.158	0.158		0.16	0.152	0.16	0.16	0.175	0.14	0.16	0.18	0.192	0.18		0.16
MgO	% m/m	0.018		0.02	0.0126	0.044					0.01	0.12	0.14	0.015		0.03
CaO	% m/m	0.36	0.41		0.39	0.375	0.4	0.4	0.41	0.4	0.41	0.38	0.45	0.39	0.31	0.4
Na2O	% m/m	5.31	5.4		5.343	3.763	5.3	5.21		5.32	5.37	5.80	4.87	5.38	5.98	5.41
K2O	% m/m	3.56	3.57		3.56	5.872	3.37	3.43	2.74	3.58	3.53	3.70	3.71	3.54		3.55
P2O5	% m/m	0.01	0.028		0.0193	0.026				0.024	0.04	0.03	0.019	0.022		0.02
H2O+	% m/m						0.43			0.34						
CO2	% m/m						0.11									
LOI	% m/m	1.15	0.79		1.083	9.32	1.18			1.1		1.19	1.09	0.66	1.08	1.09
Ag	mg kg-1	0.208									0.194					
As	mg kg-1	1.51			2.08		2			9						
Au	mg kg-1															
B	mg kg-1	38.5														
Ba	mg kg-1	11.8	10.6			17	14				10.7			11.55		13
Be	mg kg-1	59.31	60		31		51.6									
Bi	mg kg-1	23.2			19.87		27.1				22.3			22.18		
Br	mg kg-1															
Cd	mg kg-1	0.021												0.057		
Ce	mg kg-1	22.2	29.7		27		26.8	29.2			23.6			29.51		
Cl	mg kg-1		298													
Co	mg kg-1	0.39			0.97						0.5			0.459		
Cr	mg kg-1	200.3	196		196	230	196		370	160	198			174.1		192
Cs	mg kg-1	78.04	73.5		76.33		77.5	73.2		1100	75.2			72.85		
Cu	mg kg-1	5	7		3.82	5.5		5.2	12		4.8			4.27		7
Dy	mg kg-1	2.854	4.22		4.82		4.22				3.9			4.5		
Er	mg kg-1	1.13	1.77		2.09		1.87				1.55			1.94		
Eu	mg kg-1	0.02	0.02		0.125						0.02			0.018		
F	mg kg-1		12942				13634			12100						
Ga	mg kg-1	57.5	63		53.33	50	48	56.4	67	54	55.5					51
Gd	mg kg-1	2.83	4.18		6.8		3.95				3.66			4.41		
Ge	mg kg-1	6.1					8.5									
Hf	mg kg-1	9.3		8.73	7.88		8	9.9			7.3			7.95		6
Hg	mg kg-1						0.012									
Ho	mg kg-1	0.43	0.72		1.05		0.68				0.574			0.691		
I	mg kg-1					12										
In	mg kg-1				0.225											
Ir	mg kg-1															
La	mg kg-1	6.55	9.25		8.38		8.3				6.73			8.57		
Li	mg kg-1	1883			1760		1910			1710	1348			1848		
Lu	mg kg-1	0.204	0.37		0.344		0.35				0.288			0.343		
Mo	mg kg-1	0.508									0.32			0.273		
N	mg kg-1															
Nb	mg kg-1	60.1	62.1		58.67	62	67	70	60	62	63.7			53.7		56
Nd	mg kg-1	11.59	15.2		14.8		16.3				13.7			16.28		
Ni	mg kg-1	16.1	15		14.33	18	16	15.5			13.2			15.27		15
Os	mg kg-1															
Pb	mg kg-1	70.9		77.6	68.33	75	75	62.7	105	53	65.3			66.7		65
Pd	mg kg-1															
Pr	mg kg-1	3.103	4.56		4.17		4.3				3.96			4.67		
Pt	mg kg-1															
Rb	mg kg-1	2513	2489		2460	2352	2210	2450	2580	2200	2325			4172		2440
Re	mg kg-1															
Rh	mg kg-1															
Ru	mg kg-1															
S	mg kg-1													45		
Sb	mg kg-1	0.423			0.343		0.4				0.8			0.4		
Sc	mg kg-1	10.3	10.9		9.7		10				9.4			10.5		11
Se	mg kg-1															
Sm	mg kg-1	4.284	6.35		6.58		5.9				5.48			6.65		
Sn	mg kg-1	47.7			48.7	49	51	50			16.3			15.2		
Sr	mg kg-1	13.6	13		12.2	17	16	13.6	11	12	11.4			15.5		12
Ta	mg kg-1	44.6	49.3		53		47	45.7		52	39.3			16.8		64
Tb	mg kg-1	0.5075	0.79		0.88		0.85				0.722			0.84		
Te	mg kg-1															
Th	mg kg-1	16.1	15.1		13.2		14.6	13.2		29	12.3			14.5		32
Tl	mg kg-1	15			17.3		17.7				14.8					
Tm	mg kg-1		0.34				0.34				0.28			0.35		
U	mg kg-1	3.4	4.18		3.91		4.25				3.32			4.07		
V	mg kg-1	3.1	6								1.83			1.66		7
W	mg kg-1	5.8			5.09		5				5.64					
Y	mg kg-1	24.9	26.8			57	23.3				21.7			22.9		23
Yb	mg kg-1	1.515	2.68		2.52		2.6				2.14			2.53		
Zn	mg kg-1	96.9	97		92.07	92	93	89	86	88	84.3			99.4		89
Zr	mg kg-1	42.1	27		40.33	50	43	35.6	22	47	37.2			46.2		39
		Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;														
		I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;														
		S=spectrophotometry, T=titrimetry; W=wet chemistry; X=X-ray fluorescence.														
		Results L80 to L83 were submitted too late to contribute to the assessment of assigned values.														

		Table 1: GeoPT14		
		Results submitted (Nov 2003) by laboratories to the GeoPT14 round for OShBO (alkaline		
Round identifier		O76	O77	O78
Sample		OShBO	OShBO	OShBO
Technique codes		A,X	A,M,X	A,ir,M,T,X
Test portion (g)		0.25-5	0.2-0.5	0.2-4
Data quality		2	2	2
SiO2	% m/m	72.04	71.5	72.71
TiO2	% m/m			
Al2O3	% m/m	16.24	16.2	16.28
Fe2O3	% m/m	0.626	0.49	0.44
Fe(II)O	% m/m			0.43
MnO	% m/m	0.17	0.16	0.16
MgO	% m/m			
CaO	% m/m		0.38	0.39
Na2O	% m/m	4.98	5.34	5.65
K2O	% m/m	3.42	3.59	3.81
P2O5	% m/m		0.03	0.03
H2O+	% m/m			0.1
CO2	% m/m	0.29		0.25
LOI	% m/m	1.2	1.1	0.91
Ag	mg kg-1			
As	mg kg-1			
Au	mg kg-1			
B	mg kg-1	5		
Ba	mg kg-1		8.4	
Be	mg kg-1	56	18	52.25
Bi	mg kg-1	27		
Br	mg kg-1			
Cd	mg kg-1			
Ce	mg kg-1	26	26	29.36
Cl	mg kg-1			
Co	mg kg-1			
Cr	mg kg-1	192		196.53
Cs	mg kg-1	69		63.71
Cu	mg kg-1		6.2	5
Dy	mg kg-1		4	4.15
Er	mg kg-1		1.8	1.86
Eu	mg kg-1			0.05
F	mg kg-1			
Ga	mg kg-1	60		
Gd	mg kg-1		3.9	4
Ge	mg kg-1			
Hf	mg kg-1			7.46
Hg	mg kg-1			
Ho	mg kg-1		0.6	0.64
I	mg kg-1			
In	mg kg-1			
Ir	mg kg-1			
La	mg kg-1		7.8	8.18
Li	mg kg-1	1450	1500	2104
Lu	mg kg-1			0.35
Mo	mg kg-1			
N	mg kg-1			
Nb	mg kg-1	60		63.12
Nd	mg kg-1	24	15	16.25
Ni	mg kg-1			
Os	mg kg-1			
Pb	mg kg-1	69	53	
Pd	mg kg-1			
Pr	mg kg-1		4.2	4.51
Pt	mg kg-1			
Rb	mg kg-1	2274		
Re	mg kg-1			
Rh	mg kg-1			
Ru	mg kg-1			
S	mg kg-1			
Sb	mg kg-1			
Sc	mg kg-1			
Se	mg kg-1			
Sm	mg kg-1		5.9	6.24
Sn	mg kg-1	61		
Sr	mg kg-1		17	46.53
Ta	mg kg-1			44.98
Tb	mg kg-1		0.8	0.76
Te	mg kg-1			
Th	mg kg-1		13	13.11
Tl	mg kg-1			13.16
Tm	mg kg-1			0.37
U	mg kg-1		3.7	3.61
V	mg kg-1			
W	mg kg-1			
Y	mg kg-1	20	22	25.75
Yb	mg kg-1		2.4	2.42
Zn	mg kg-1	97	130	94
Zr	mg kg-1	40		40.73

Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric; I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other; S=spectrophotometry, T=titrimetry; W=wet chemistry; X=X-ray fluorescence.

Results L80 to L83 were submitted too late to contribute to the assessment of assigned values.

Table 2 GeoPT 14 (OShBO-alkaline granite)
Assigned values and robust statistical analysis of contributed data

	X_a % m/m	H_a % m/m	sdm % m/m	sdm/H_a	status		X_a mg/kg	H_a mg/kg	sdm mg/kg	sdm/H_a	status
SiO2	71.95	0.76	0.08	0.111	assigned	**Lu**	0.325	0.031	0.006	0.198	assigned
Al2O3	16.04	0.21	0.04	0.175	assigned	**Nb**	61.4	2.6	0.9	0.325	assigned
Fe2O3	0.472	0.011	0.006	0.534	assigned	**Nd**	15.4	0.8	0.4	0.536	assigned
MnO	0.160	0.004	0.001	0.210	assigned	**Ni**	15.0	0.8	0.5	0.596	*provisional*
CaO	0.392	0.009	0.003	0.376	assigned	**Pb**	64.8	2.8	1.3	0.482	assigned
Na2O	5.43	0.08	0.02	0.245	assigned	**Pr**	4.18	0.27	0.08	0.308	assigned
K2O	3.59	0.06	0.01	0.234	assigned	**Rb**	2379	59	22	0.380	assigned
LOI	1.09	0.02	0.01	0.645	*provisional*	**Sb**	0.42	0.04	0.01	0.355	assigned
	mg/kg	mg/kg	mg/kg			**Sc**	9.37	0.54	0.31	0.577	assigned
Ba	13.0	0.7	0.5	0.712	*provisional*	**Sm**	5.96	0.36	0.10	0.264	assigned
Be	59.3	2.6	2.3	0.878	*provisional*	**Sn**	47.4	2.1	1.6	0.768	*provisional*
Bi	22.7	1.1	1.1	0.992	*provisional*	**Sr**	13.0	0.7	0.4	0.554	assigned
Ce	26.3	1.3	0.5	0.374	assigned	**Ta**	47.4	2.1	1.4	0.654	*provisional*
Cr	195.7	7.1	3.6	0.506	assigned	**Tb**	0.785	0.065	0.018	0.274	assigned
Cs	75.6	3.2	1.1	0.337	assigned	**Th**	13.3	0.7	0.3	0.380	assigned
Cu	5.46	0.34	0.27	0.807	*provisional*	**Tl**	15.0	0.8	0.5	0.601	*provisional*
Dy	4.19	0.27	0.09	0.328	assigned	**Tm**	0.319	0.030	0.007	0.227	assigned
Er	1.76	0.13	0.04	0.314	assigned	**U**	3.72	0.24	0.13	0.549	assigned
Eu	0.03	0.004	0.003	0.744	*provisional*	**W**	4.99	0.31	0.23	0.746	*provisional*
Ga	55.0	2.4	0.8	0.340	assigned	**Y**	23.3	1.2	0.7	0.643	*provisional*
Gd	3.95	0.26	0.10	0.406	assigned	**Yb**	2.37	0.17	0.04	0.241	assigned
Hf	7.90	0.46	0.15	0.321	assigned	**Zn**	91.0	3.7	1.2	0.329	assigned
Ho	0.661	0.056	0.018	0.317	assigned	**Zr**	39.6	1.8	0.9	0.496	assigned
La	8.24	0.48	0.25	0.517	assigned						

X_a=assigned value calculated as the robust mean of submitted data.
H_a=target precision calculated using a modified version of the Horwitz equation
for Data quality 1 ($Ha=0.01Xa^{0.8495}$).
sdm=standard deviation of the mean calculated from submitted data using robust statistics.

Table 3: GeoPT14

Z-scores for laboratories participating in the GeoPT14 round for OShBO (alkaline granite).

Round identifier	O1	O2	O2	O3	O4	O4	O5	O6	O6	O7	O7	O8	O9	O10	O11	O12	O13	O14	O15	O15	O16	O17	O18	O19
Sample	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO
Technique codes	X	ISE,X	ISE,X	IR,X	M	M	X	X	X	I	I	A,M	I	AA,T, M,X	M	X	X	IR,T,X	A,AA, M,X	A,AA, M,X	AA,C	X	X	I
Test portion (g)	5	0.5	0.5	0.7-1	0.1	0.1	1.5	0.7	10	1	10	0.1	0.4	0.1-0.75	0.1	0.6-5.4	1	0.1-0.8	0.1-8	0.1-8	0.1-1	0.7-5	0.5-5	0.15
Data quality	2	1	2	2	1	2	2	1	2	1	2	2	1	1	2	2	2	2	1	2	2	2	1	1
SiO2	-0.4	-0.3	*	-0.4	*	*	0.5	-0.5	*	*	*	0.0	*	0.0	*	0.3	-0.4	0.1	1.3	*	-12.7	0.1	-0.1	*
Al2O3	2.3	-0.2	*	-0.2	*	*	0.3	0.1	*	*	*	-0.3	-2.2	-1.1	*	0.1	-2.9	0.1	-1.4	*	-36.8	0.0	0.7	*
Fe2O3	13.2	-0.2	*	-6.7	*	*	0.6	23.1	*	*	0.7	6.1	1.7	3.5	*	-1.7	72.3	-0.1	3.5	*	8.4	0.4	-22.9	-4.0
MnO	3.6	0.1	*	-0.4	*	*	-0.3	0.3	*	*	*	-0.2	0.1	-2.5	*	0.1	-0.7	-0.1	-0.1	*	-9.5	0.0	0.1	*
CaO	4.4	-2.4	*	-1.9	*	*	-0.6	1.2	*	*	*	1.0	*	-0.5	*	0.1	7.4	1.0	2.5	*	-21.2	-0.6	6.5	*
Na2O	4.5	1.4	*	0.0	*	*	-0.1	1.0	*	*	2.0	-1.2	0.2	-0.2	*	0.6	-2.3	-0.1	-0.2	*	94.9	0.4	1.5	1.1
K2O	2.6	-0.8	*	0.3	*	*	0.3	-0.6	*	*	3.0	0.0	5.2	-1.0	*	-0.5	0.7	-0.2	3.4	*	-0.3	-0.3	-1.2	*
LOI	*	0.9	*	-4.5	*	*	0.0	-0.9	*	*	*	1.6	*	-6.5	*	-4.5	-2.8	2.6	-0.9	*	7.9	0.0	-2.8	*
Ba	*	*	*	*	-2.0	*	*	*	10.0	*	*	0.1	*	-2.6	-0.4	1.5	*	*	*	0.0	*	*	*	*
Be	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.9	*	*	*	*	-3.8	*	*	*	*
Bi	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	19.5	*	*
Ce	*	*	*	*	2.1	*	*	*	*	-0.2	*	0.3	-0.3	0.2	-3.5	-1.2	*	*	*	-1.7	*	*	*	5.2
Cr	*	*	*	-0.9	*	*	*	*	-4.3	*	0.8	-1.4	-0.4	0.2	*	1.9	*	-0.1	*	-2.5	-4.0	-2.2	3.3	4.8
Cs	*	*	*	*	0.1	*	*	*	*	*	0.9	-0.7	1.7	-0.8	4.2	0.4	*	*	*	*	*	*	*	-1.4
Cu	*	*	*	*	*	*	*	3.4	*	*	*	14.1	*	-0.1	*	*	*	*	*	-0.7	-1.0	*	*	*
Dy	*	*	*	*	0.7	*	*	*	*	*	*	-0.3	-0.3	1.0	-0.4	*	*	*	4.5	*	*	*	*	*
Er	*	*	*	*	0.7	*	*	*	*	*	*	-1.0	*	0.1	-0.3	*	*	*	4.2	*	*	*	*	*
Eu	*	*	*	*	-0.6	*	*	*	*	32.0	*	-1.2	*	-0.7	0.0	*	*	*	44.3	*	*	*	*	4.9
Ga	*	*	*	*	*	*	*	*	-0.6	*	*	*	*	-0.5	-0.1	-0.9	*	-0.1	*	*	*	*	*	*
Gd	*	*	*	*	0.7	*	*	*	*	*	*	-1.3	*	0.8	-0.3	*	*	*	5.2	*	*	*	*	*
Hf	*	*	*	*	*	0.0	*	*	*	*	-0.6	-0.9	0.4	-0.9	0.6	*	*	*	*	*	*	*	*	0.9
Ho	*	*	*	*	0.0	*	*	*	*	8.3	*	-0.2	*	-0.1	-0.1	*	*	*	3.7	*	*	*	*	*
La	*	*	*	*	0.8	*	*	*	*	0.4	*	-0.1	0.1	-1.2	-2.4	*	*	7.3	*	-0.2	*	*	*	-0.1
Lu	*	*	*	*	0.2	*	*	*	*	-0.8	*	-0.4	-0.5	0.5	0.1	*	*	*	4.0	*	*	*	*	*
Nb	*	*	*	*	*	*	*	-1.4	*	*	*	-0.6	*	2.7	-4.4	-1.5	*	-0.7	*	-0.3	*	*	0.2	*
Nd	*	*	*	*	0.5	*	*	*	*	5.0	*	-0.1	3.3	-0.1	11.6	*	*	-2.9	3.1	*	*	*	*	6.9
Ni	*	*	*	*	*	*	*	-2.8	*	*	*	0.4	*	-2.5	-0.6	9.1	*	-0.8	*	-0.6	-0.2	8.1	*	-2.5
Pb	*	*	*	*	-0.7	*	*	1.9	*	*	*	*	*	0.0	2.5	1.3	*	-0.1	*	-2.9	-7.3	1.5	0.1	*
Pr	*	*	*	*	1.3	*	*	*	*	*	*	0.1	*	0.5	0.2	*	*	*	2.7	*	*	*	*	*
Rb	8.6	*	*	*	4.0	*	*	-0.8	*	*	-0.4	-1.9	4.8	-2.0	0.0	0.5	*	0.2	*	1.3	*	2.0	*	-1.8
Sb	*	*	*	*	*	*	*	*	*	*	4.2	1.0	17.8	*	-0.1	*	*	*	*	*	*	*	*	0.8
Sc	*	*	*	*	*	*	*	*	-4.4	*	0.4	-0.2	1.0	0.2	0.3	*	*	*	*	-4.1	*	*	*	-2.4
Sm	*	*	*	*	0.5	*	*	*	*	0.1	*	-0.1	2.3	0.3	-0.3	*	*	*	4.0	*	*	*	*	0.4
Sn	*	*	*	*	*	*	*	*	*	*	*	-0.1	*	*	*	-0.9	*	*	*	*	*	*	*	*
Sr	*	*	*	*	-0.3	*	*	1.1	*	*	*	0.4	*	-0.1	1.0	-0.4	*	0.1	*	2.1	*	*	-5.7	*
Ta	*	*	*	*	*	*	*	*	*	*	1.1	-0.6	5.2	-0.1	*	*	*	*	*	*	*	*	*	0.6
Tb	*	*	*	*	0.4	*	*	*	*	1.9	*	-0.8	0.7	0.5	-0.7	*	*	*	4.8	*	*	*	*	-2.4
Th	*	*	*	*	-0.5	*	*	*	5.9	*	0.8	-1.0	3.7	-1.0	-0.7	14.5	*	-0.6	*	*	*	-0.9	*	0.1
Tl	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1.0	*	*	*	*	*	*	*	*	*
Tm	*	*	*	*	*	*	*	*	*	*	*	0.0	*	0.4	0.0	*	*	*	4.3	*	*	*	*	*
U	*	*	*	*	-0.3	*	*	*	0.6	*	-0.9	-0.5	2.0	-0.3	-0.4	*	*	*	*	*	*	8.8	*	0.5
W	*	*	*	*	*	*	*	*	*	*	-1.7	-1.1	*	*	*	*	*	*	*	6.4	*	*	*	-1.6
Y	*	*	*	*	-0.2	*	*	-12.8	*	*	*	-0.6	*	1.5	-0.4	*	*	2.2	*	-1.9	*	190.3	*	*
Yb	*	*	*	*	0.3	*	*	*	*	-0.3	*	-0.9	-0.1	0.0	-0.3	*	*	*	4.1	*	*	*	*	2.6
Zn	*	*	*	*	*	*	*	0.0	*	*	*	-1.6	*	-3.0	*	-0.1	*	0.0	*	-0.4	44.0	0.4	0.5	-6.8
Zr	*	*	*	*	*	0.4	*	1.5	*	*	*	-0.7	*	0.0	*	2.3	*	-1.3	*	8.6	*	*	0.2	*

Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;
I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;
S=spectrophotometry, T=titrimetry; W=wet chemistry; X=X-ray fluorescence.

Table 3: GeoPT14

Z-scores for laboratories participating in the GeoPT14 round for OShBO (alkaline granite).

Round identifier	O20	O21	O21	O22	O23	O24	O25	O26	O27	O28	O29	O29	O30	O30	O31	O32	O32	O33	O34	O35	O36	O37	O38	O39
Sample	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO
Technique codes	V,X	X	X	AA,A,ISE,X	X	M,X	X	X	A,IR,M,X	X	T,X	X	X	X	X	X	X	M	M,X	A,ir,ISE,M,V	X	A	A,ir,M,X	X
Test portion (g)	0.5-7	1	4.5	0.2-3	0.28-6	0.06-1	.002-0.1	1	0.2-7	0.6	0.36-6	6	6-0.6	6-0.6	1.5	1.0-9	1.0-9	0.1	0.1-10	0.2-0.3	1.0-5	0.05	0.25-2.0	0.3
Data quality	2	1	2	1	1	1	2	2	2	1	1	2	1	2	2	1	2	1	1	2	2	1	2	2
SiO2	0.0	1.2	*	-0.9	-1.1	0.5	-2.2	1.2	0.4	1.1	0.1	*	-1.1	*	-0.1	-0.2	*	*	-0.5	0.3	0.0	0.9	0.4	*
Al2O3	0.3	1.1	*	-2.1	4.5	2.9	-6.7	-0.6	-0.1	-0.4	0.4	*	-0.9	*	0.1	0.9	*	*	-0.3	-1.0	0.1	-1.1	0.6	*
Fe2O3	3.7	0.8	*	-1.1	5.5	20.6	-3.3	0.9	-2.0	0.0	-2.8	*	-2.1	*	-2.0	-0.2	*	*	-0.9	1.3	0.1	1.2	-0.1	*
MnO	-3.2	2.5	*	0.6	0.1	2.5	-2.6	0.0	-0.1	1.3	-0.4	*	0.1	*	-13.0	-1.6	*	*	-1.3	0.6	-0.2	-1.1	-1.1	*
CaO	0.5	-0.2	*	-1.3	-0.2	-2.4	-1.2	-0.1	-0.5	-2.2	0.4	*	4.3	*	0.5	0.9	*	*	-1.8	0.6	-1.6	1.9	0.5	*
Na2O	-0.2	0.9	*	1.4	5.8	4.0	*	-0.2	0.6	0.3	1.1	*	-0.6	*	0.4	-0.1	*	*	-0.6	0.0	0.5	-0.4	1.0	*
K2O	-0.1	0.7	*	1.0	-3.0	-0.3	-3.6	-0.2	-0.6	-0.3	0.6	*	-3.2	*	0.8	0.5	*	*	-0.2	0.5	0.2	-0.8	-0.3	98.0
LOI	-1.4	1.9	*	3.7	3.7	18.1	*	-0.2	-2.1	-8.0	-4.6	*	2.3	*	-0.7	-2.8	*	*	4.6	2.6	1.3	1.7	-2.1	*
Ba	67.9	39.2	*	*	69.3	-2.6	-2.1	*	0.9	*	-2.8	*	94.8	*	-2.8	*	12.0	-1.8	-0.9	-1.0	15.1	*	-1.4	*
Be	*	*	*	2.8	*	4.4	*	*	0.4	*	*	*	*	*	-2.8	*	*	2.9	4.9	0.0	*	*	0.3	*
Bi	*	*	*	-3.3	*	*	0.1	*	-1.3	*	*	*	*	*	-3.4	*	*	1.7	0.1	1.1	*	*	5.9	*
Ce	*	*	*	1.7	*	0.8	-0.5	*	-0.8	*	*	1.0	*	-0.5	-0.5	*	5.0	-0.9	0.2	1.3	-0.2	*	-1.4	*
Cr	5.8	3.9	*	-0.8	2.6	0.6	-1.8	*	-3.8	*	5.2	*	1.6	*	-3.9	-1.9	*	-5.1	2.3	1.7	1.8	*	-0.8	*
Cs	*	*	*	*	*	0.8	0.9	*	-2.0	*	*	*	*	-4.2	*	*	1.7	0.1	0.0	0.6	*	*	-0.6	*
Cu	0.8	-10.5	*	3.1	-10.2	-4.3	18.6	*	-1.5	*	-3.7	*	*	31.9	*	10.5	*	-7.4	-4.3	2.3	-0.7	*	3.8	*
Dy	*	*	*	1.3	*	0.8	*	*	-0.9	*	*	*	*	*	*	*	*	-1.3	1.3	1.1	*	*	-3.3	*
Er	*	*	*	0.7	*	0.3	*	*	-1.3	*	*	*	*	*	*	*	*	-1.2	1.0	0.2	*	*	-2.5	*
Eu	*	*	*	68.8	*	-4.9	*	*	*	*	*	*	*	*	*	*	*	-2.0	0.2	0.0	*	*	*	*
Ga	*	1.8	*	*	*	-2.2	4.8	*	-2.2	*	*	*	*	*	*	6.4	*	-5.5	0.9	0.5	-0.7	*	-0.6	*
Gd	*	*	*	1.9	*	-0.7	*	*	-0.5	*	*	*	*	*	*	*	*	-1.9	1.0	0.7	*	*	-2.4	*
Hf	*	*	*	*	*	-0.1	*	*	-1.3	*	*	*	*	-4.2	*	*	*	0.4	1.4	0.9	*	*	-0.9	*
Ho	*	*	*	*	*	0.3	*	*	-1.1	*	*	*	*	*	*	*	*	-1.3	0.2	0.6	*	*	-2.3	*
La	*	*	*	-0.4	*	-0.8	-1.3	*	-1.0	*	*	13.3	*	*	*	*	19.1	-2.1	0.0	0.6	28.6	*	-2.4	*
Lu	*	*	*	-0.8	*	0.2	*	*	-0.6	*	*	*	*	*	*	*	*	-1.7	0.2	0.7	*	*	-2.0	*
Nb	0.1	0.9	*	0.0	0.6	1.6	-2.0	*	0.7	*	-0.7	*	-3.6	*	*	-0.2	*	-0.8	-0.3	3.0	0.4	*	8.8	*
Nd	*	*	*	0.4	*	0.4	-0.8	*	-0.8	*	*	*	*	-0.8	-3.3	*	3.5	-1.4	0.1	0.1	*	*	-2.4	*
Ni	34.8	12.7	*	*	6.3	-2.5	-1.3	*	-2.3	*	10.9	*	*	1.9	9.4	25.1	*	-2.8	4.0	0.0	-3.9	*	6.3	*
Pb	3.3	-0.3	*	-0.7	*	-12.8	-3.6	*	-2.0	*	-1.4	*	3.7	*	-8.1	-3.4	*	0.8	1.2	0.6	0.0	*	-0.1	*
Pr	*	*	*	1.6	*	0.5	-4.0	*	-1.2	*	*	*	*	*	*	*	*	0.0	0.5	1.0	*	*	-3.1	*
Rb	0.4	-1.5	*	-1.6	-1.0	-4.5	-1.4	*	-0.1	*	1.8	*	-4.3	*	*	0.4	*	-14.1	1.0	0.9	-0.5	*	0.2	40.0
Sb	*	*	*	2.9	*	*	*	*	-0.5	*	*	*	*	*	*	*	*	0.0	-0.9	0.0	*	*	*	*
Sc	*	0.3	*	*	*	10.7	*	*	0.2	*	*	*	*	*	*	*	*	7.5	0.2	-0.3	-1.0	*	-6.9	*
Sm	*	*	*	-0.1	*	0.1	*	*	-1.3	*	*	*	*	*	*	*	*	-1.0	0.2	0.3	*	*	-2.7	*
Sn	*	*	*	0.8	*	*	*	*	-1.9	*	*	*	*	-0.8	-1.7	*	*	*	-2.6	2.0	*	*	-4.8	*
Sr	7.8	0.7	*	5.6	-7.1	1.3	-2.8	*	-1.5	*	5.8	*	*	-2.1	-2.1	-1.3	*	-2.6	0.5	0.0	0.2	*	5.6	*
Ta	*	*	*	*	*	-0.7	*	*	-0.8	*	*	*	*	*	*	*	*	-1.7	-5.7	1.7	*	*	-3.6	*
Tb	*	*	*	*	*	0.7	*	*	-0.7	*	*	*	*	*	*	*	*	-1.5	0.5	0.7	*	*	-3.0	*
Th	6.8	*	*	-0.3	*	-11.6	*	*	-1.5	*	*	*	*	3.3	*	0.5	*	0.1	-0.3	0.2	-3.0	*	-3.2	*
Tl	*	*	*	*	*	-9.4	*	*	-1.7	*	*	*	*	*	*	*	*	1.4	0.7	0.8	*	*	*	*
Tm	*	*	*	*	*	0.4	*	*	-0.5	*	*	*	*	*	*	*	*	-1.3	0.2	0.3	*	*	-2.0	*
U	*	*	3.0	21.6	*	-9.3	*	*	-0.7	*	*	*	*	*	*	-3.8	*	0.7	0.2	1.0	-7.6	*	-0.7	*
W	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.2	-2.0	0.8	*	*	*	*
Y	*	5.1	*	-0.3	*	1.9	0.7	*	-0.6	*	-12.5	*	*	-0.1	*	161.8	*	-5.1	0.2	0.6	4.9	*	-5.3	*
Yb	*	*	*	0.8	178.0	-0.2	*	*	-1.0	*	*	*	*	*	53.0	*	*	-1.3	0.0	0.4	*	*	-3.8	*
Zn	1.4	*	*	1.1	-14.6	*	-0.7	*	1.5	-24.6	0.5	*	-2.7	*	-2.8	1.8	*	-1.0	0.0	1.1	-0.1	*	8.4	*
Zr	1.2	2.3	*	-3.1	12.9	-0.2	-2.6	*	-1.0	*	2.8	*	*	0.9	11.1	-5.6	*	0.0	0.1	2.0	-10.9	*	-0.2	*

Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;
I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;
S=spectrophotometry, T=titrimetry; W=wet chemistry; X=X-ray fluorescence.

Table 3: GeoPT14

Z-scores for laboratories participating in the GeoPT14 round for OShBO (alkaline granite).

Round identifier	O40	O41	O42	O43	O43	O44	O45	O46	O47	O48	O49	O50	O50	O51	O52	O52	O53	O54	O55	O56	O57	O58	O58	O59
Sample	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO
Technique codes	X	A	AA,ISE,W,X	I	I	X	A,M	X	M,X	I	X	X	X	A,M	AA,AE,ISE,	AA,AE,ISE,	X	A,M,O,X	M,X	AA,EO,S,X	AA,OT,X	X	X	A,M,X
Test portion (g)	0.4-5	0.1-0.8	0.5-10	0.21	0.21	0.4	0.25	1.0-7	.125-3.5	0.04	1.0-10	1.0-20	20	0.2	0.1-0.5	0.1-0.5	0.18	0.05-0.5	0.1-5	0.06-5	0.01-0.7	0.12	0.12	0.05-4
Data quality	2	2	2	1	2	2	2	1	1	2	2	1	2	2	1	2	2	1	2	2	1	1	2	2
SiO2	-0.6	-2.0	-0.6	*	0.7	-0.1	-0.4	0.8	0.4	*	0.0	-0.2	*	*	*	*	*	0.5	0.3	0.0	-0.5	1.7	*	0.8
Al2O3	-0.4	-2.5	-1.5	3.2	*	0.2	-0.2	0.3	0.8	*	0.1	-0.2	*	-7.0	*	*	*	0.0	0.3	4.1	-0.6	1.1	*	0.1
Fe2O3	-13.8	-9.1	1.8	-2.1	*	-1.0	1.7	0.8	-1.1	1.0	0.1	-7.7	*	-1.2	*	*	-2.1	-2.1	-0.1	2.7	2.7	2.7	*	1.0
MnO	2.2	-1.1	0.2	0.1	*	0.0	0.5	-0.4	1.0	*	-0.2	0.1	*	-0.3	*	*	1.2	0.1	0.0	-1.7	0.1	1.3	*	-1.3
CaO	-0.1	-2.9	-4.5	*	*	-1.7	2.9	-0.2	3.1	*	-1.6	-13.5	*	-1.1	*	*	22.5	8.7	1.0	-2.6	-1.3	0.2	*	2.5
Na2O	-0.4	1.0	-3.9	2.1	*	10.9	-0.4	-1.1	0.3	-0.3	0.5	1.6	*	-0.1	-14.5	*	*	-0.3	-1.5	-1.9	-0.8	0.5	*	-0.7
K2O	-0.1	9.4	0.5	4.1	*	-0.3	-0.5	-0.3	0.4	-2.0	0.2	1.4	*	0.8	-15.9	*	9.9	1.2	0.0	0.5	-1.5	0.6	*	-2.8
LOI	-5.3	*	1.2	*	*	*	*	0.0	-1.4	*	1.3	0.5	*	*	*	*	*	-8.8	-2.6	0.0	3.3	*	*	-1.9
Ba	5.0	-2.8	*	*	*	*	1.8	23.3	1.0	*	15.1	*	999.6	-0.1	*	*	*	-1.7	3.5	*	48.1	*	*	*
Be	*	-3.0	*	*	*	*	-0.2	*	*	*	*	*	*	-4.0	*	1.1	*	0.8	*	-4.7	*	*	*	*
Bi	*	-4.1	-2.5	*	*	*	*	*	*	*	*	*	*	*	*	*	-1.2	-0.4	*	*	4.7	*	*	*
Ce	*	-5.1	*	3.7	*	*	-0.1	*	0.8	0.5	-0.2	*	43.4	*	*	*	*	-3.4	-0.1	*	-18.9	*	*	-1.0
Cr	2.4	-0.1	0.7	0.9	*	*	0.2	0.7	-1.8	-0.4	1.8	-3.6	*	1.2	*	-5.1	2.4	-2.9	*	-3.2	1.9	*	*	0.9
Cs	*	*	*	-0.6	*	*	2.3	*	-0.1	-0.6	*	*	*	0.0	-20.5	*	*	0.1	*	*	3.0	*	*	*
Cu	*	-1.1	-0.1	*	*	*	*	9.0	1.6	*	-0.7	-4.3	*	0.7	*	4.7	13.1	0.1	*	-3.0	7.5	*	*	*
Dy	*	*	*	1.3	*	*	0.0	*	2.3	*	*	*	*	*	*	*	*	-1.8	-0.8	*	-4.4	*	*	-0.1
Er	*	*	*	*	*	*	0.3	*	1.0	*	*	*	*	*	*	*	*	-1.2	-0.8	*	1.9	*	*	-0.3
Eu	*	*	*	*	*	*	-1.2	*	1.5	13.5	*	*	*	*	*	*	*	0.7	*	*	730.2	*	*	-3.1
Ga	*	*	-0.2	*	0.8	*	-0.7	-0.6	-0.1	*	-0.7	-0.4	*	*	*	*	3.5	-0.7	*	*	0.8	*	*	*
Gd	*	*	*	*	*	*	-0.5	*	1.4	*	*	*	*	*	*	*	*	-3.3	-0.7	*	54.7	*	*	0.1
Hf	*	*	*	0.0	*	*	0.1	*	-0.1	0.2	*	*	*	*	*	2.3	*	1.5	*	*	-8.4	*	*	*
Ho	*	*	*	*	*	*	0.3	*	1.1	*	*	*	*	*	*	*	*	-1.4	-0.5	*	94.9	*	*	-0.2
La	*	-4.2	*	0.4	*	*	-0.6	*	0.8	1.1	28.6	*	27.9	-2.1	*	*	*	-3.6	-0.5	*	30.8	*	*	-1.4
Lu	*	*	*	-0.2	*	*	-0.2	*	0.6	0.3	*	*	*	0.7	*	*	*	-0.5	-0.2	*	*	*	*	0.0
Nb	*	-1.0	-1.4	*	*	*	0.4	4.0	1.7	*	0.4	-2.0	*	*	*	2.6	*	-0.5	-1.6	6.5	-1.7	*	*	1.8
Nd	*	-4.0	*	*	1.5	*	-0.2	*	-1.0	0.6	*	*	*	*	*	*	*	-3.5	-0.5	*	0.8	*	*	-1.8
Ni	-2.5	*	15.7	*	*	*	-1.4	-3.9	-18.8	*	-3.9	8.8	*	0.4	*	*	-0.3	-1.1	*	0.0	0.0	*	*	*
Pb	*	-5.2	-0.9	*	*	*	-2.4	3.7	0.9	*	0.0	-2.1	*	0.3	*	-0.1	1.5	-2.5	*	4.2	1.1	*	*	0.6
Pr	*	*	*	*	*	*	0.1	*	-0.4	*	*	*	*	*	*	*	*	-2.5	-0.2	*	-0.7	*	*	-0.6
Rb	-0.6	*	1.0	-2.0	*	*	2.8	0.7	4.1	-0.2	-0.5	-0.6	*	*	-11.5	*	0.1	-6.3	-0.8	-20.1	-0.2	*	*	0.5
Sb	*	41.5	*	*	*	*	*	*	*	*	*	*	*	-0.3	*	*	*	-2.6	*	*	-11.0	*	*	*
Sc	*	-2.9	*	0.9	*	*	-0.6	*	3.6	0.2	-1.0	4.9	*	-2.6	*	7.1	*	-2.9	*	-1.3	-0.7	*	*	*
Sm	*	*	*	1.6	*	*	-0.2	*	1.3	0.3	*	*	*	*	*	*	*	-2.3	-0.8	*	0.1	*	*	-1.0
Sn	*	-9.1	3.0	*	*	*	-0.2	*	*	*	*	*	*	-7.4	*	1.3	*	-12.9	0.9	7.7	1.7	*	*	*
Sr	-1.4	-2.8	*	*	*	*	*	-1.3	2.8	*	0.2	0.0	*	0.8	*	*	-4.2	-4.3	*	*	-4.3	*	*	0.3
Ta	*	*	*	-2.7	*	*	0.8	*	0.4	-0.8	*	*	*	*	*	12.4	*	-2.6	1.3	*	7.8	*	*	*
Tb	*	*	*	-0.2	*	*	0.0	*	1.7	0.4	*	*	*	*	*	*	*	-1.6	-0.5	*	3.3	*	*	0.0
Th	*	*	*	-0.3	*	*	0.0	2.4	0.9	0.2	-3.0	2.4	*	-0.7	*	*	*	-3.0	4.0	*	15.0	*	*	4.1
Tl	*	*	-0.6	*	*	*	-1.2	*	*	*	*	*	*	-0.1	*	0.6	*	0.1	*	*	*	*	*	*
Tm	*	*	*	*	*	*	-0.1	*	0.5	*	*	*	*	*	*	*	*	-1.3	-0.3	*	*	*	*	-0.1
U	*	*	*	*	-2.5	*	0.0	15.1	-0.1	-0.1	-7.6	13.4	*	-1.5	*	*	*	-0.9	*	*	-11.1	*	*	2.7
W	*	*	*	*	0.3	*	*	*	*	*	*	*	*	19.2	*	*	*	-2.5	*	*	-12.7	*	*	*
Y	*	-3.6	*	*	*	*	1.0	*	2.1	*	4.9	29.9	*	-2.5	*	*	*	-5.3	4.2	33.1	-3.7	*	*	3.4
Yb	*	6.4	*	-0.4	*	*	-0.2	*	-0.3	12.2	*	*	*	*	*	*	*	-1.6	-0.7	*	9.8	*	*	-0.1
Zn	-0.3	-2.6	0.1	-1.2	*	*	-1.2	1.7	1.6	4.9	-0.1	-0.8	*	1.9	*	-1.8	-1.4	-1.3	*	0.4	1.4	*	*	*
Zr	-1.3	-2.1	-0.4	*	*	*	-3.3	1.1	-1.1	*	-10.9	0.2	*	3.8	*	0.1	*	3.0	-0.4	-1.0	-2.5	*	*	0.7

Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;
I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;
S=spectrophotometry, T=titrimetry; W=wet chemistry; X=X-ray fluorescence.

Table 3: GeoPT14

Z-scores for laboratories participating in the GeoPT14 round for OShBO (alkaline granite).

Round identifier	O60	O61	O61	O62	O63	O63	O64	O65	O66	O67	O68	O69	O70	O71	O72	O73	O74	O75	O76	O77	O78
Sample	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO	OShBO
Technique codes	X	M	M	A,M,X	A,M,T,X	M,X	A,I,M,X	X	AA,A,M,X	A,M,X	X	AA,S,T,X	M,X	AA,G,S	X	A,M,X	-	A,AA,ir,T,X	A,X	A,M,X	A,ir,M,T,X
Test portion (g)	1	0.1	0.1	0.1-12	0.1-7.5	0.1-1	0.2-3	0.8-12	0.1-2	0.2-0.25	10	0.1-5	0.25-0.6	0.004-0.1	0.18	0.1-2	-	0.1-4	0.25-5	0.2-0.5	0.2-4
Data quality	1	1	2	2	1	2	1	1	2	2	2	2	1	1	1	2	2	1	2	2	2
SiO2	-0.7	*	*	0.0	-0.3	*	-0.5	1.2	-0.6	-0.6	*	-0.2	-0.3	0.6	0.5	-0.2	0.2	-0.1	0.1	-0.3	0.5
Al2O3	1.7	*	*	-0.1	-0.7	*	0.3	1.7	0.6	1.7	*	0.0	-0.4	-4.5	2.4	0.1	-0.1	-0.2	0.5	0.4	0.6
Fe2O3	-4.9	*	*	-0.1	0.8	*	1.4	1.1	-4.3	-1.5	2.3	0.9	-4.0	0.8	-43.3	-8.1	-0.7	0.8	7.3	0.9	-1.5
MnO	3.9	*	*	-0.2	-0.4	*	0.1	-1.8	0.0	0.0	1.8	-2.3	0.1	4.9	7.7	2.4	*	0.1	1.2	0.0	0.0
CaO	-1.3	*	*	-1.7	2.1	*	-0.2	-1.8	0.5	0.5	1.0	0.5	2.1	-1.3	6.5	-0.1	-4.5	0.9	*	-0.6	-0.1
Na2O	-2.4	*	*	-0.7	-0.4	*	-1.1	-19.8	-0.8	-1.3	*	-0.7	-0.8	4.3	-6.7	-0.3	3.2	-0.3	-2.7	-0.6	1.3
K2O	-1.9	*	*	-0.3	-0.3	*	-0.5	38.5	-1.9	-1.4	-7.2	-0.1	-1.0	1.9	2.0	-0.4	*	-0.7	-1.4	0.0	1.9
LOI	3.7	*	*	1.4	-13.9	*	-0.3	382.5	2.1	*	*	0.2	*	4.6	0.0	-10.0	-0.2	0.0	2.6	0.2	-4.2
Ba	*	*	-0.3	-0.8	-3.4	*	*	5.7	0.7	*	*	*	-3.3	*	*	-1.0	*	0.0	*	-3.3	*
Be	*	*	*	0.0	0.3	*	-11.0	*	-1.5	*	*	*	*	*	*	*	*	*	-0.6	-8.0	-1.4
Bi	*	*	*	0.2	*	*	-2.5	*	1.9	*	*	*	-0.4	*	*	-0.2	*	*	1.9	*	*
Ce	*	1.2	*	-1.6	2.6	*	0.5	*	0.2	1.1	*	*	-2.1	*	*	1.2	*	*	-0.1	-0.1	1.2
Cr	*	3.8	*	0.3	0.0	*	0.0	4.8	0.0	*	12.3	-2.5	0.3	*	*	-1.5	*	-0.5	-0.3	*	0.1
Cs	*	-1.6	*	0.4	-0.7	*	0.2	*	0.3	-0.4	*	162.4	-0.1	*	*	-0.4	*	*	-1.0	*	-1.9
Cu	*	*	0.8	-0.7	4.6	*	-4.8	0.1	*	-0.4	9.7	*	-1.9	*	*	-1.8	*	4.6	*	1.1	-0.7
Dy	*	*	0.6	-2.5	0.1	*	2.3	*	0.1	*	*	*	-1.1	*	*	0.6	*	*	*	-0.3	-0.1
Er	*	*	0.4	-2.4	0.1	*	2.6	*	0.4	*	*	*	-1.6	*	*	0.7	*	*	*	0.2	0.4
Eu	*	*	*	-1.2	-2.5	*	23.4	*	*	*	*	*	-2.5	*	*	-1.5	*	*	*	*	2.5
Ga	*	1.9	*	0.5	3.3	*	-0.7	-2.1	-1.5	0.3	2.5	-0.2	0.2	*	*	*	*	-1.7	1.0	*	*
Gd	*	0.2	*	-2.2	0.9	*	11.1	*	0.0	*	*	*	-1.1	*	*	0.9	*	*	*	-0.1	0.1
Hf	*	0.3	*	1.5	*	0.9	-0.1	*	0.1	2.2	*	*	-1.3	*	*	0.0	*	-4.1	*	*	-0.5
Ho	*	-0.3	*	-2.1	1.1	*	6.9	*	0.2	*	*	*	-1.5	*	*	0.3	*	*	*	-0.5	-0.2
La	*	1.4	*	-1.8	2.1	*	0.3	*	0.1	*	*	*	-3.1	*	*	0.3	*	*	*	-0.5	-0.1
Lu	*	0.9	*	-2.0	1.4	*	0.6	*	0.4	*	*	*	-1.2	*	*	0.3	*	*	*	*	0.4
Nb	*	-0.6	*	-0.2	0.3	*	-1.0	0.2	1.1	1.6	-0.3	0.1	0.9	*	*	-1.5	*	-2.0	-0.3	*	0.3
Nd	*	*	1.2	-2.3	-0.2	*	-0.7	*	0.6	*	*	*	-2.0	*	*	0.6	*	*	5.3	-0.2	0.6
Ni	*	*	9.7	0.7	0.0	*	-0.8	3.8	0.6	0.3	*	*	-2.3	*	*	0.2	*	0.0	*	*	*
Pb	*	*	-0.3	1.1	*	2.3	1.3	3.7	1.8	-0.4	7.3	-2.1	0.2	*	*	0.3	*	0.1	0.8	-2.1	*
Pr	*	1.0	*	-2.0	1.4	*	0.0	*	0.2	*	*	*	-0.8	*	*	0.9	*	*	*	0.0	0.6
Rb	*	*	0.1	1.1	1.9	*	1.4	-0.5	-1.4	0.6	1.7	-1.5	-0.9	*	*	15.2	*	1.0	-0.9	*	*
Sb	*	*	*	0.0	*	*	-2.0	*	-0.3	*	*	*	9.9	*	*	-0.3	*	*	*	*	*
Sc	*	*	*	0.9	2.9	*	0.6	*	0.6	*	*	*	0.1	*	*	1.1	*	3.1	*	*	*
Sm	*	0.4	*	-2.3	1.1	*	1.7	*	-0.1	*	*	*	-1.3	*	*	1.0	*	*	*	-0.1	0.4
Sn	*	*	*	0.1	*	*	0.6	0.8	0.9	0.6	*	*	-14.7	*	*	-7.6	*	*	3.2	*	*
Sr	*	*	0.4	0.4	0.0	*	-1.2	5.6	2.1	0.4	-1.4	-0.7	-2.3	*	*	1.8	*	-1.4	*	2.8	23.7
Ta	*	-2.6	*	-0.7	0.9	*	2.6	*	-0.1	-0.4	*	1.1	-3.8	*	*	-7.2	*	7.8	*	*	-0.6
Tb	*	0.1	*	-2.1	0.1	*	1.5	*	0.5	*	*	*	-1.0	*	*	0.4	*	*	*	0.1	-0.2
Th	*	-0.6	*	2.0	2.6	*	-0.1	*	0.9	0.0	*	11.0	-1.3	*	*	0.9	*	26.1	*	-0.2	-0.1
Tl	*	*	*	0.0	*	*	2.9	*	1.7	*	*	*	-0.2	*	*	*	*	*	*	*	-1.1
Tm	*	-0.3	*	*	0.7	*	*	*	0.3	*	*	*	-1.3	*	*	0.5	*	*	*	*	0.8
U	*	0.2	*	-0.7	1.9	*	0.8	*	1.1	*	*	*	-1.6	*	*	0.7	*	*	*	0.0	-0.2
W	*	-0.3	*	1.3	*	*	0.3	*	0.0	*	*	*	2.1	*	*	*	*	*	*	*	*
Y	*	-0.6	*	0.7	3.0	*	*	29.0	0.0	*	*	*	-1.4	*	*	-0.2	*	-0.3	-1.4	-0.6	1.1
Yb	*	*	0.3	-2.6	1.9	*	0.9	*	0.7	*	*	*	-1.4	*	*	0.5	*	*	*	0.1	0.2
Zn	*	*	1.4	0.8	1.6	*	0.3	0.3	0.3	-0.3	-0.7	-0.4	-1.8	*	*	1.1	*	-0.5	0.8	5.3	0.4
Zr	*	-0.3	*	0.7	-6.9	*	0.4	5.7	0.9	-1.1	-4.8	2.0	-1.3	*	*	1.8	*	-0.3	0.1	*	0.3

Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;
I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;
S=spectrophotometry, T=titrimetry; W=wet chemistry; X=X-ray fluorescence.

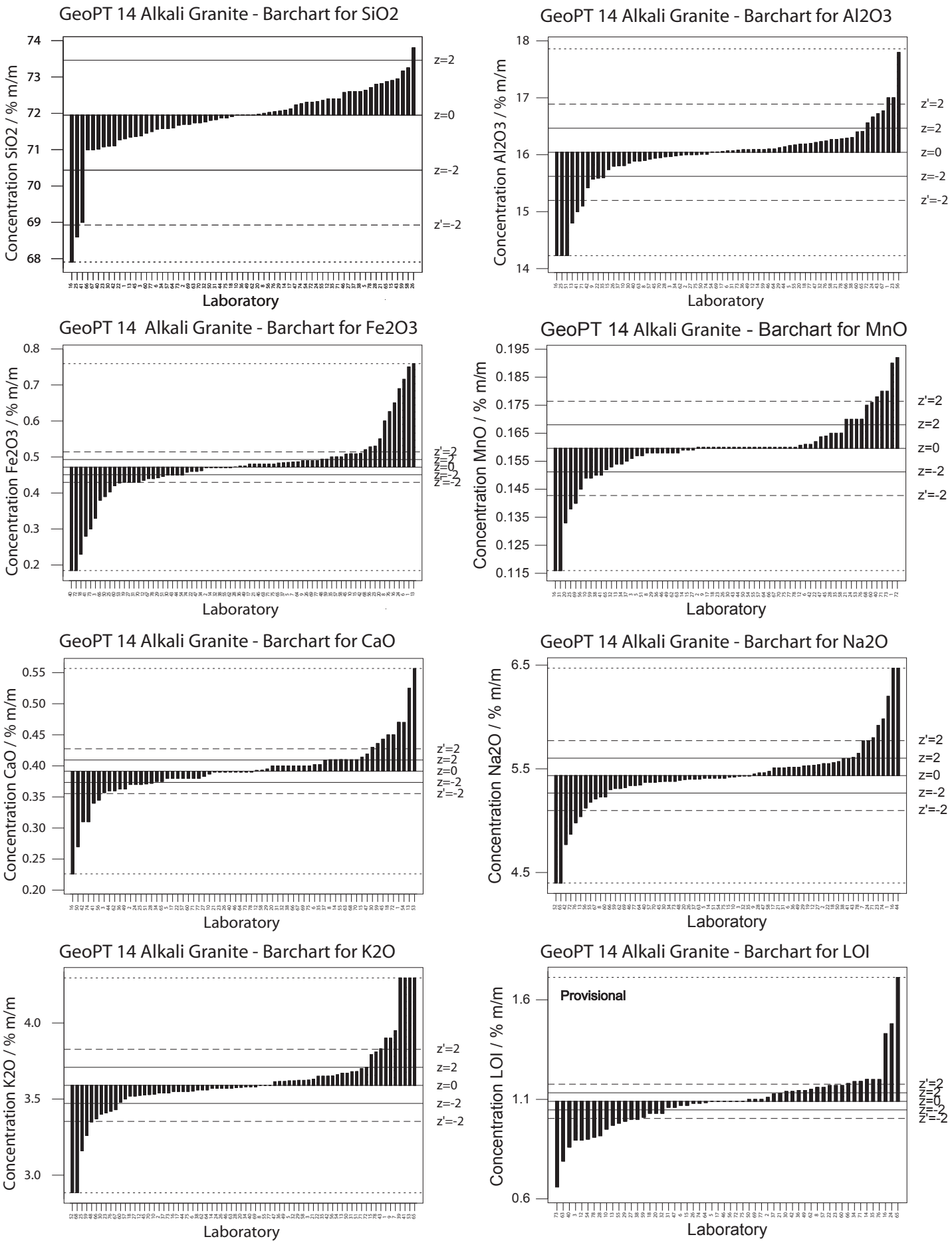


Figure 1 GeoPT14 – OShBO alkaline granite: Data distribution charts for elements for which values were assigned. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

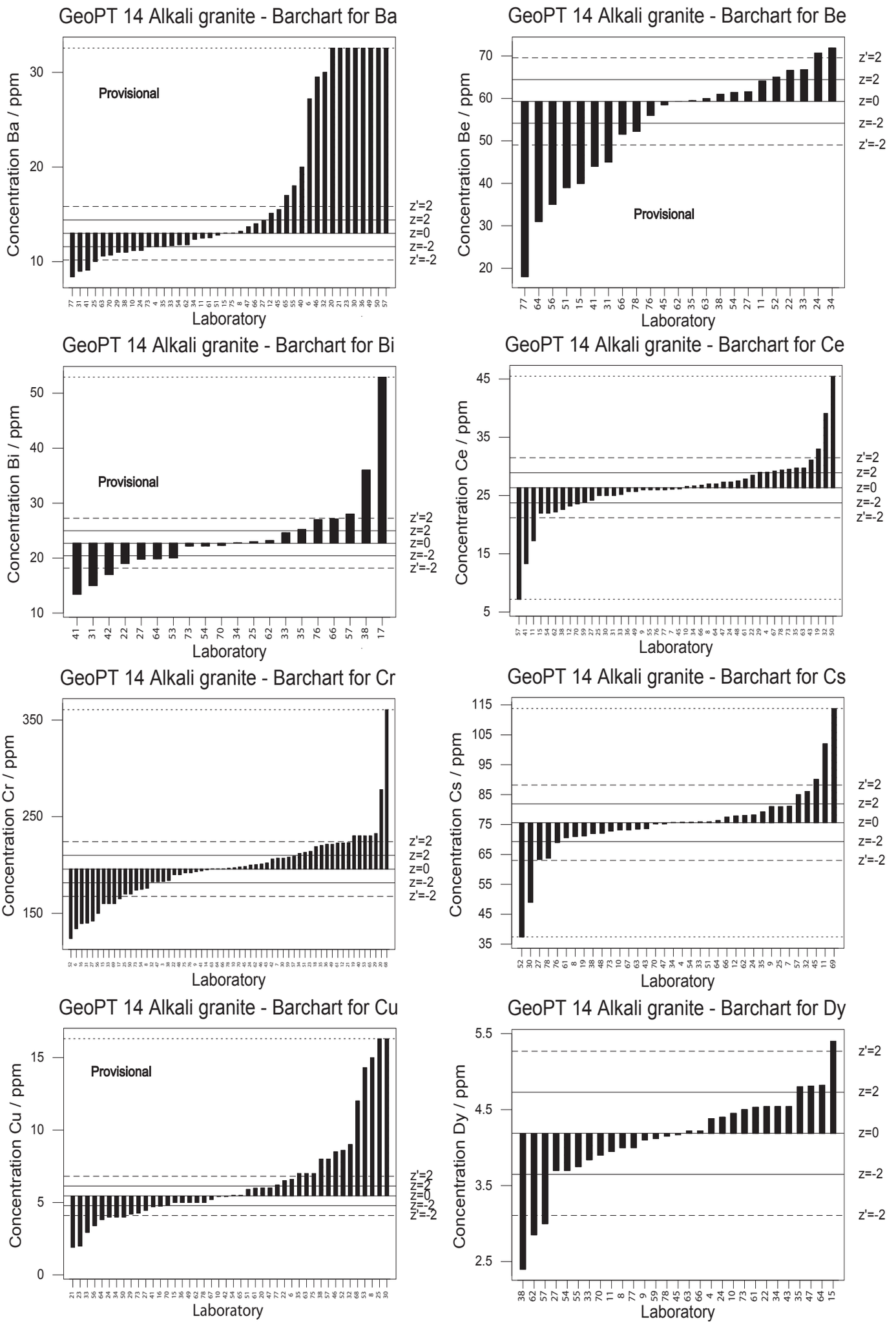


Figure 1 GeoPT14 – OShBO alkaline granite: Data distribution charts for elements for which values were assigned. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

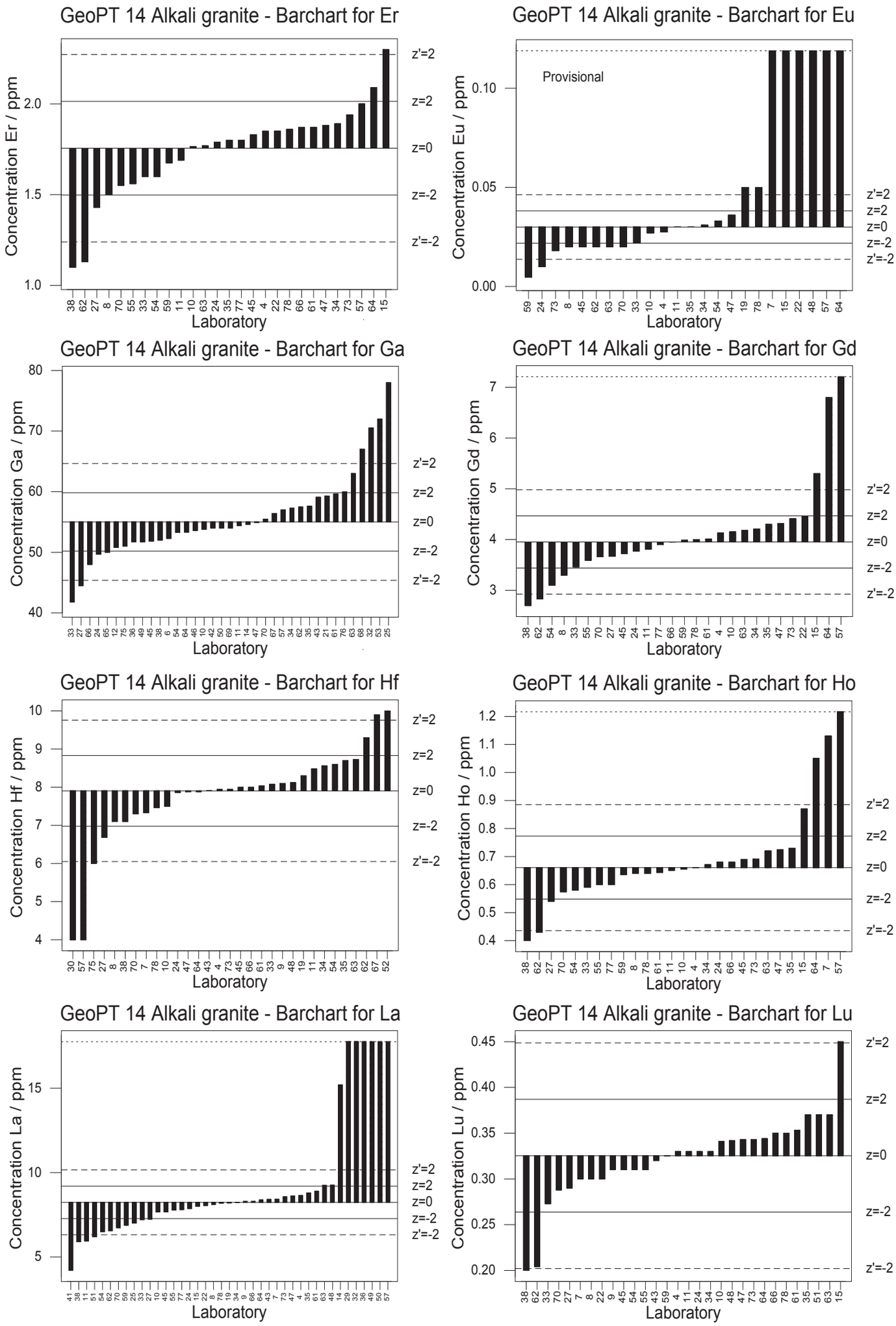


Figure 1 GeoPT14 – OShBO alkaline granite: Data distribution charts for elements for which values were assigned. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

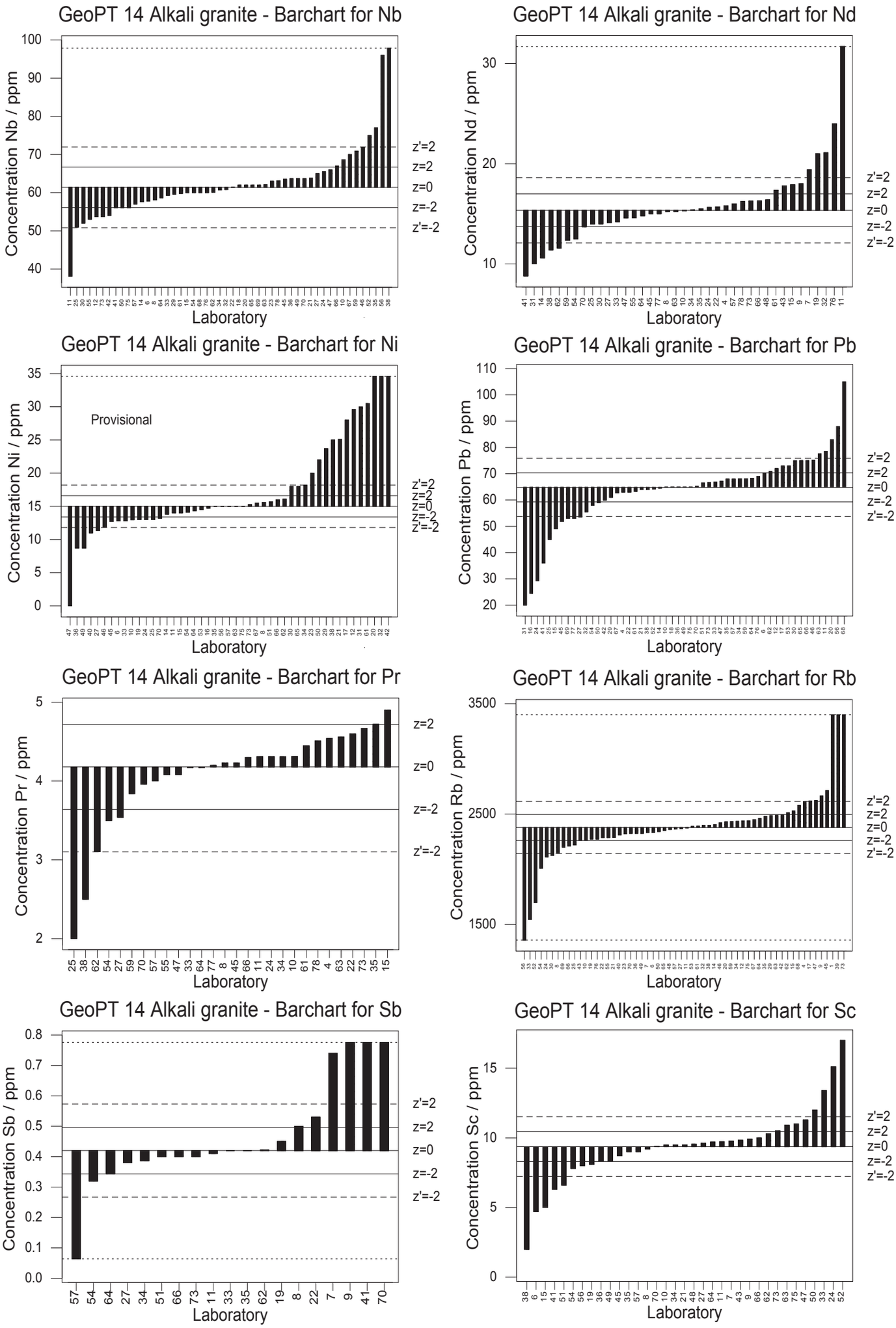


Figure 1 GeoPT14 – OShBO alkaline granite: Data distribution charts for elements for which values were assigned. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

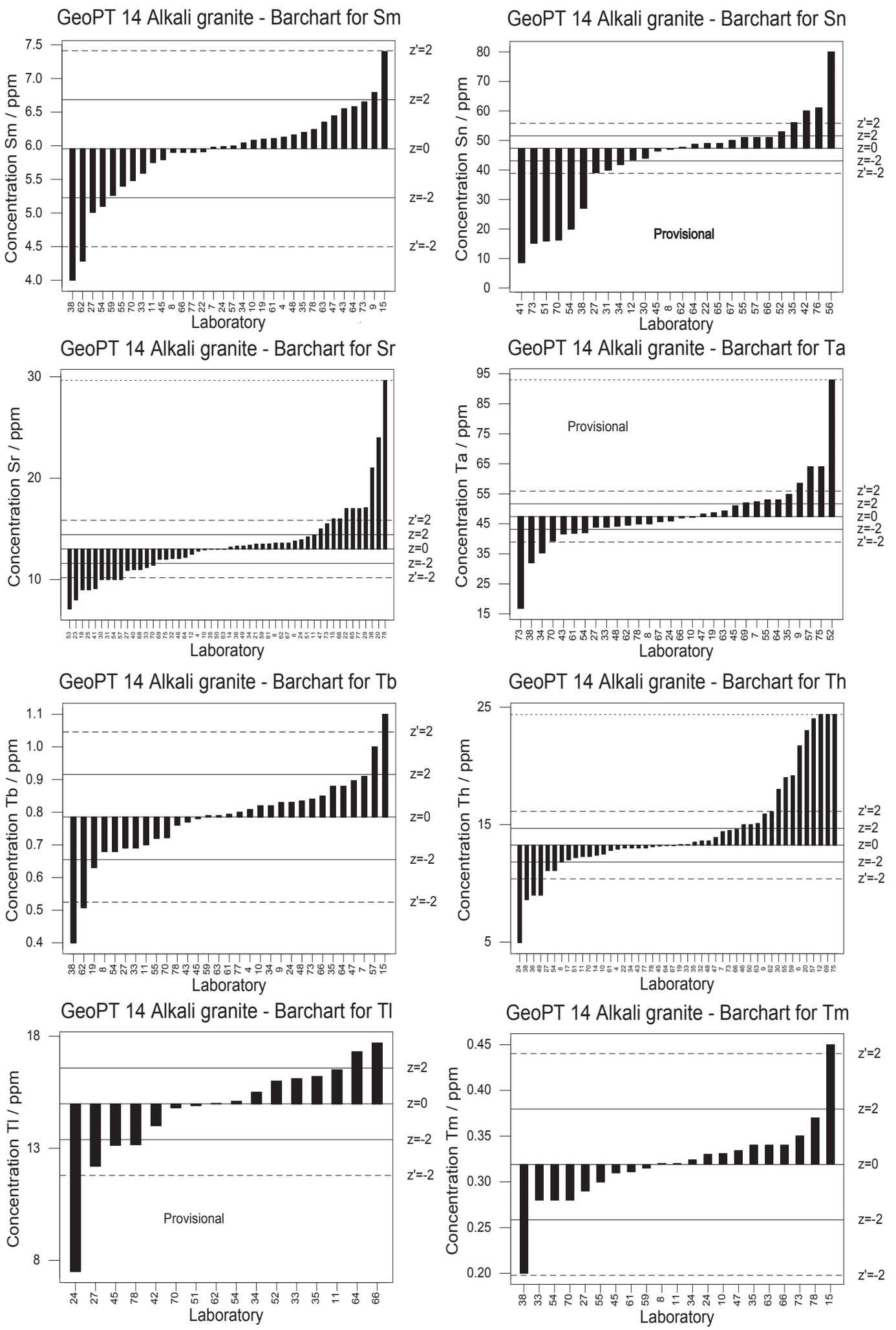


Figure 1 GeoPT14 – OShBO alkaline granite: Data distribution charts for elements for which values were assigned. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

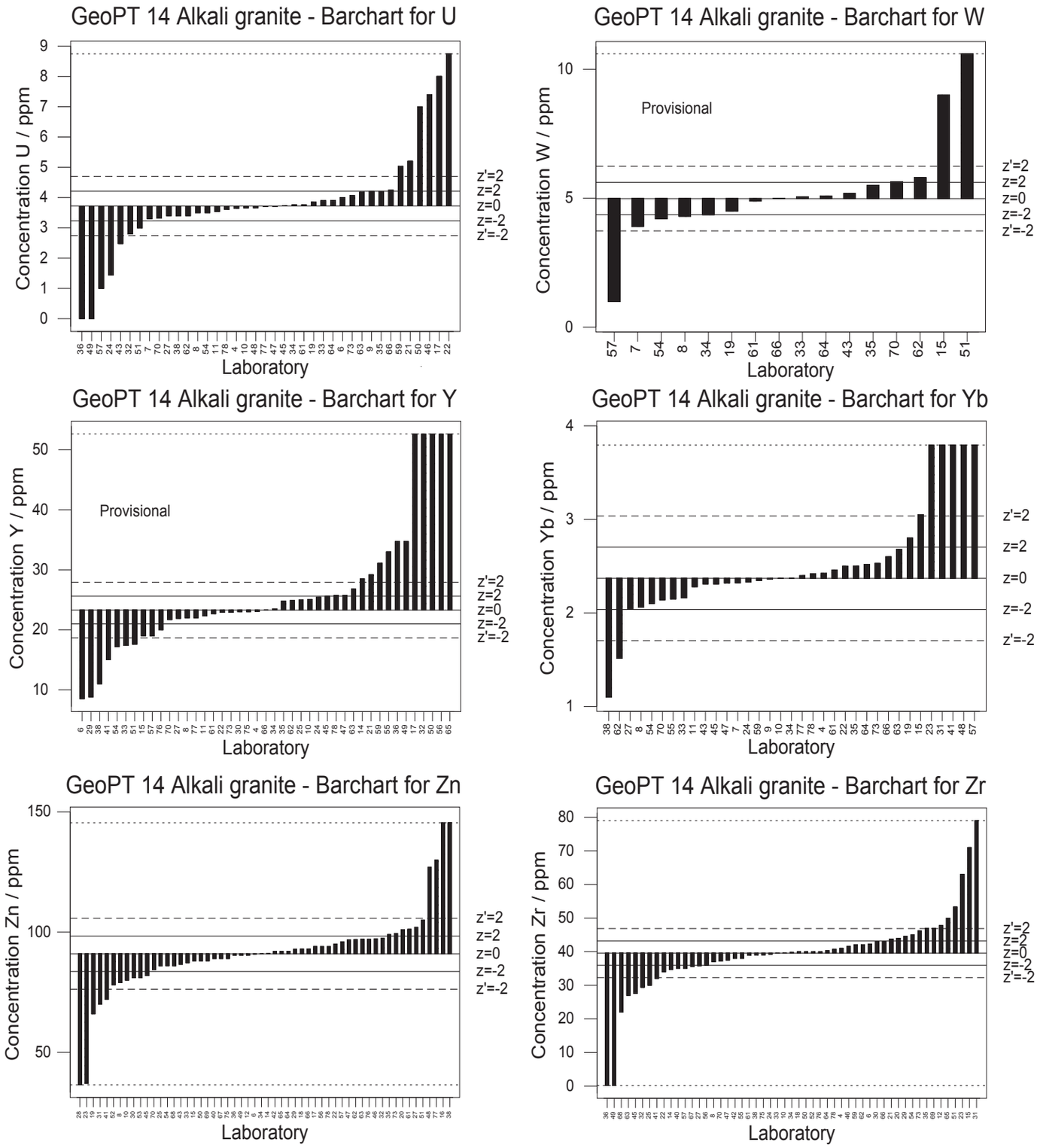
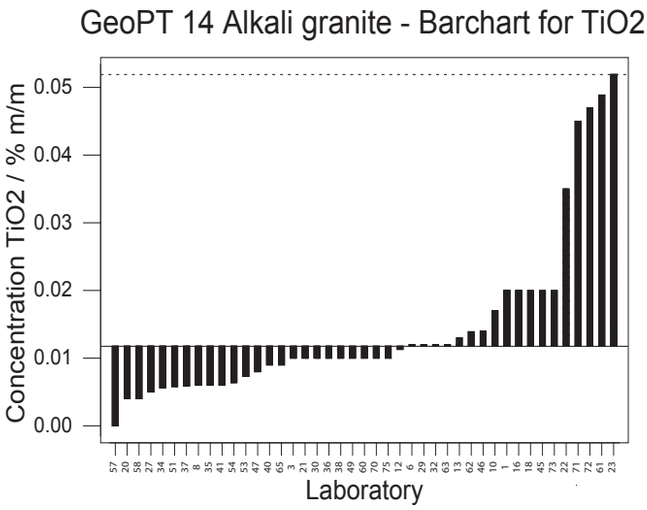
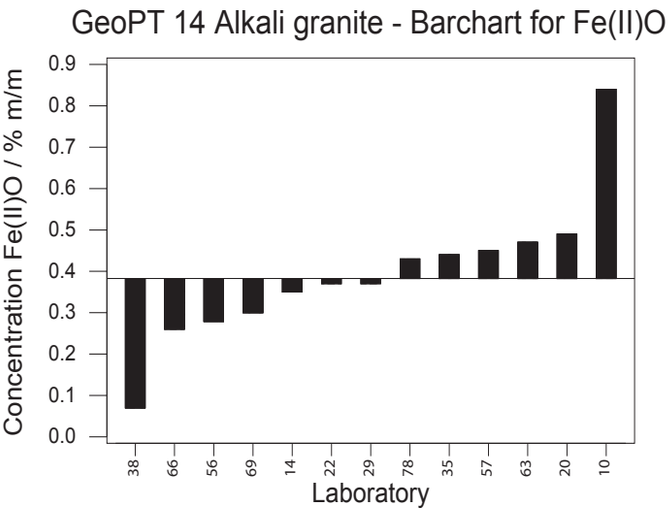
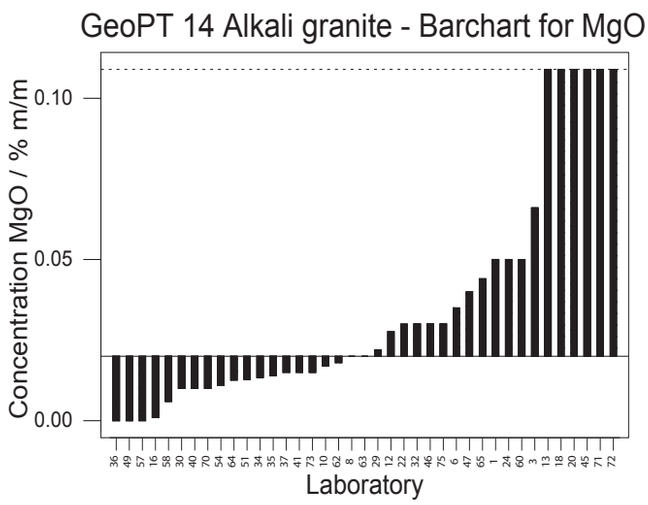
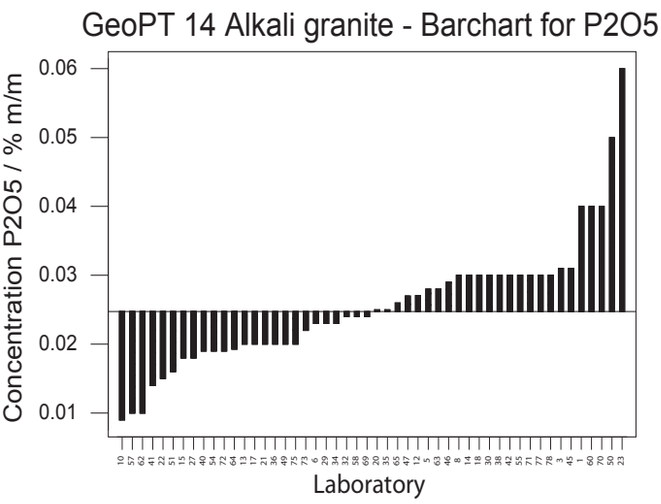


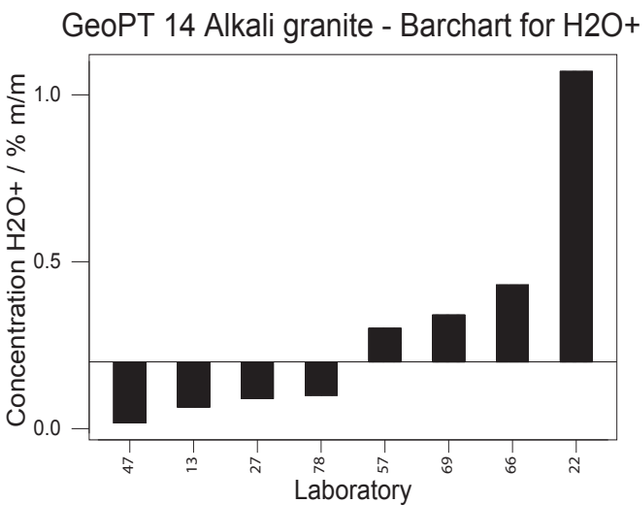
Figure 1 GeoPT14 – OShBO alkaline granite: Data distribution charts for elements for which values were assigned. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).











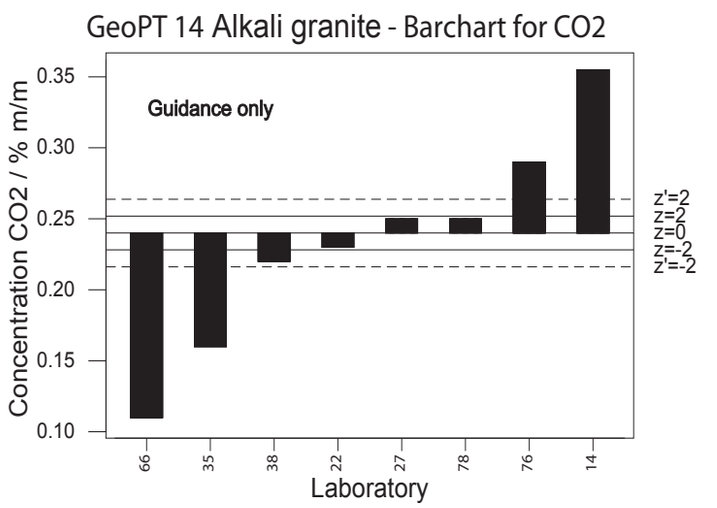


Figure 2 GeoPT14 –OShBO alkaline granite: Data distribution charts for elements for which values were not assigned.

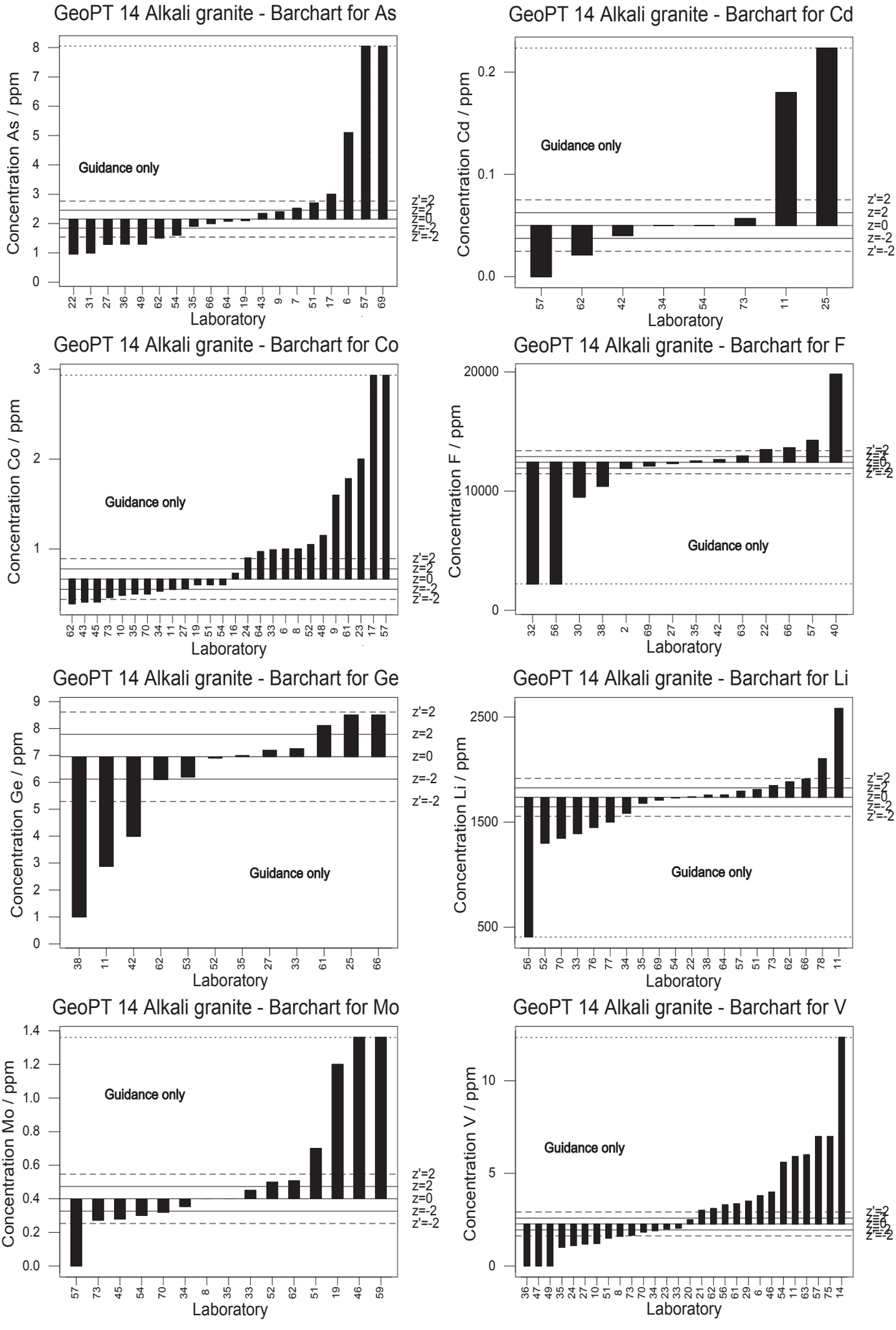


Figure 2 GeoPT14 –OShBO alkaline granite: Data distribution charts for elements for which values were not assigned.

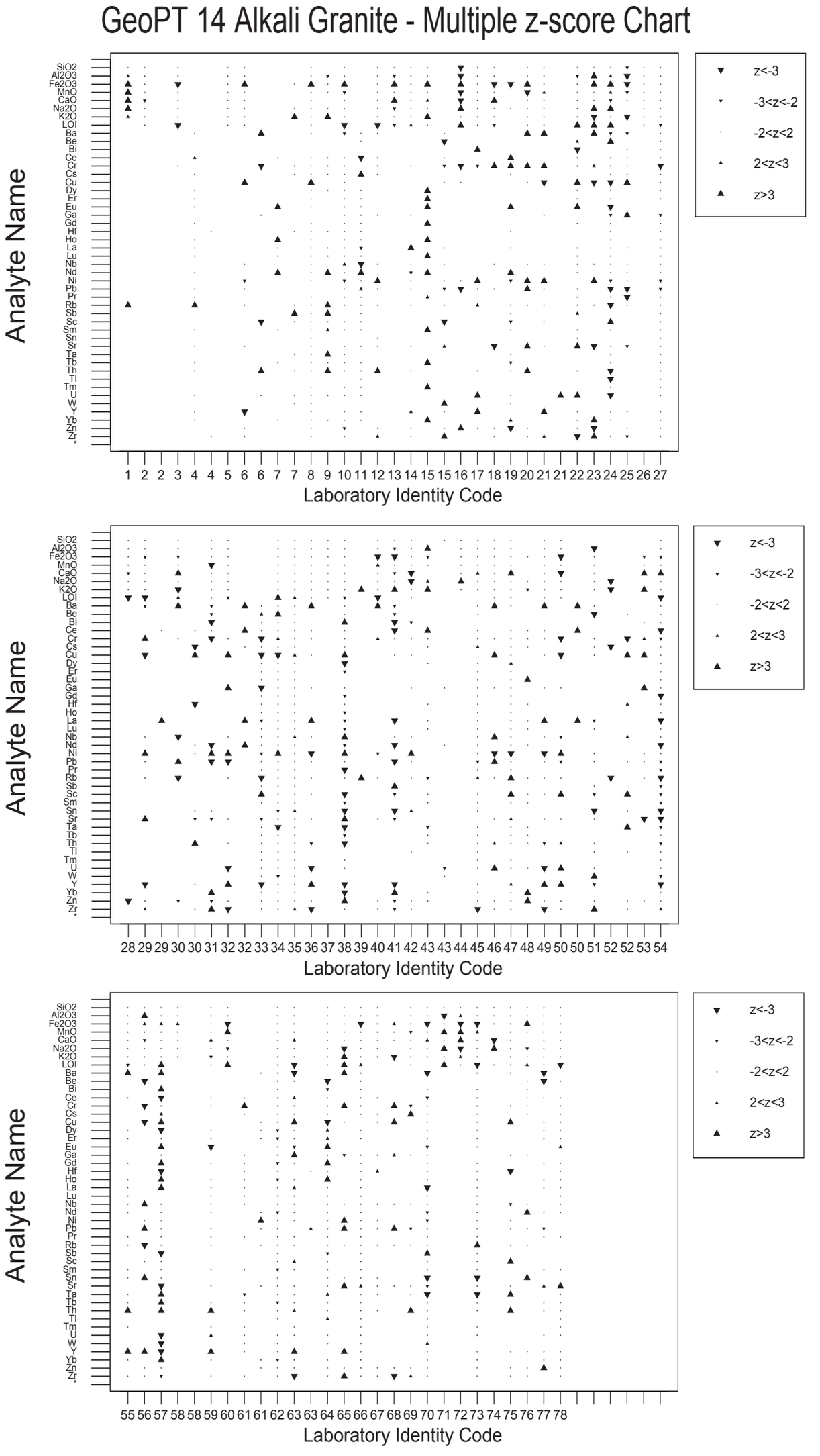


Figure 3 GeoPT14 –OShBO alkaline granite: Multiple z-score charts for laboratories participating in the GeoPT12 round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria Satisfactory data are plotted as ' · '. Data for other categories are plotted as follows: z<-3 (▾), -3<z<-2 (·), +2<z<+3 (·), Z>+3 (▴).