GEOPT7 - AN INTERNATIONAL PROFICIENCY TEST FOR ANALYTICAL GEOCHEMISTRY LABORATORIES - REPORT ON ROUND 7 (GBPG-1 Garnet-biotite plagiogneiss).

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Abstract

Results are presented for round seven, GeoPT7, of the international proficiency testing programme for analytical geochemistry laboratories. The sample distributed for this round was GBPG-1 Garnet-biotite plagiogneiss, a candidate reference material prepared by the Institute of Geochemistry, Irkutsk. 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 seventh round of the international proficiency testing programme, GeoPT7, was conducted in a similar manner to earlier rounds. The programme is designed to be part of the standard 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. By examining the magnitude of the z-score, participating laboratories can decide whether the quality of their data is satisfactory in relation to both the 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. In this report, therefore, only the features of the present round are included and readers interested in further details are invited to review the previously published reports.

Steering Committee for Round 7: M. Thompson (Chair), P.J. Potts (Secretary), J.S. Kane, L.L Petrov.

Sample: GBPG-1 Garnet-biotite plagiogneiss was prepared and packaged as a candidate reference material by the Institute of Geochemistry, Irkutsk, Russia. A sub-set of approximately 110 packets were made available to the GeoPT proficiency testing programme. The remaining stock was held at the Institute of Geochemistry pending certification of this sample as a reference material. Ten packets of the sample available for distribution were selected at random and tested for homogeneity using procedures established in previous rounds. Results are listed in Appendix 2.

Timetable for GeoPT7:

Distribution of sample: March 2000

Deadline for submission of analytical results: 15th May 1999

Distribution of preliminary report: July 2000

Submission of results

Results submitted by seventy-six participating laboratories are listed in Table 1. Data from seventy-two of these laboratories was submitted by the cut-off data and contributed to the full assessment of assigned values as well as z-score analysis. Data from the final four laboratories contributed to the z-score assessment only.

Assigned values

Following procedures described in earlier rounds, results submitted before the cut-off data were analysed using robust statistical procedures 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 12 major and 37 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 tendency 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 :

SiO_2, TiO_2, Al_2O_3, Fe_2O_3T, FeO, MnO, MgO, CaO, Na_2O, K_2O, P_2O_5, LOI, Ba, Be, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Ga, Gd, Hf, Ho, La, Li, Lu, Mo, Nb, Nd, Ni, Pb, Pr, Rb, Sc, Sm, Sr, Ta, Tb, Th, Tm, U, V, Y, Yb, Zn, Zr.

Charts in Figure 2 show distribution data for elements that were not judged to be satisfactory in the statistical analysis to assign values. In the present round, values could not be assigned to the following elements: H_2O^+, CO_2, Ag, Bi, Cd, F, Ge, Hg, S, Sb, Sn, Tl, W.

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

(i) Insufficient number of contributed results.

(ii) A strongly positively skewed frequency distribution of results, sometimes with hints of multimodality.

(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 sigma value, so that no matter where the consensus were placed most of the participants would receive an 'unsatisfactory' classification if z-scores were calculated.

In the electronic version of this paper, it is planned that element symbols will be linked to the relevant distribution chart via a hypertext link.

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 pure geochemistry laboratories, where analytical results are designed for geochemical research and where care is taken to provide data of high accuracy, sometimes at the expense of reduced sample throughput rates.

Data quality 2 for applied geochemistry laboratories, where, although accuracy is 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 precision $[H_a]$ for each element assessed was calculated from a modified version 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 precision.

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. 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.

Participating laboratories

Laboratories that contributed data to this proficiency testing round are listed in Table 4

Overall performance

As a summary of the performance of individual laboratories in this round, a multiple z-score chart is plotted in Figure 3. 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-score values that were greater or lower than the acceptable z-score limits. These data are designed to help individual laboratories to decide their response to 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 GeoPT8 round, the sample for which will be distributed during September 2000.

Acknowledgments

The authors are very grateful to Liz Lomas (OU) for valued assistance with this work, to John Watson for undertaking the homogeneity testing measurements by XRF and to the Institute for Geochemistry, Irkutsk, for making available the current sample. This program was 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.W. (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.W. 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. Submitted for publication to 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. Submitted for publication to the electronic version of Geostandards Newsletter: The Journal of Geostandards and Geoanalysis (Summer 2000).

GeoPT6

Philip J. Potts, Michael Thompson, Jean S. Kane, Peter C Webb and Jean Carignan (2000)
GEOPT6 - an international proficiency test for analytical geochemistry laboratories - report on round 6 (OU-3: Nanhoron microgranite) and 6A (CAL-S: CRPG limestone). Unpublished report.

Appendix 2

Homogeneity testing

Homogeneity testing was based on analysis of duplicate test samples taken from each of 10 packets, selected at random. These samples were analysed in duplicate by WD-XRF at the Open University for the major elements (SiO_2, Al_2O_3, Fe_2O_3, MnO, MgO, CaO, Na_2O, K_2O, P_2O_5, TiO_2, LOI, Ba, Cr, Ni) on glass discs and the trace elements (As, Ba, Co, Cr, Cu, Ga, Mo, Nb, Ni, Pb, Rb, S, Sc, Sr, Th, U, V, Zn, Zr) on powder pellets, following the procedures described in the GeoPT1 report. Results for 12 major/minor and 19 trace elements were analysed using standard analysis of variance (ANOVA) procedures.

The power of the ANOVA test depends on the inherent precision in measurements of the individual elements determined and is poorest for those elements whose concentrations approach the method detection limit (DL). Among the trace elements for the GeoPT7 homogeneity test, U, Mo, As, and S all occurred at concentrations in the detection limit range (<2DL), and Pb, Th, and Sc occurred at only slightly higher concentrations (2DL to 5DL). Homogeneity conclusions for these elements were not reached because of the unreliability of the test. Homogeneity was demonstrated most reliably for Rb, Sr, Zr, Ba, V, Cr, Ni, Co and Zn, all occurring at concentrations >10 times the detection limit. It is also demonstrated for the following trace elements occurring at concentrations between 5 and 10 times the detection limit: Y, Nb, Cu, and Ga.

Statistically significant differences between packets were detected at the 95% confidence level for Fe_2O_3, CaO, and Ga. The differences noted, however, are not significant at the 99% level. Also the differences are small enough in comparison to the target precision (H_a) such that they would not affect a laboratory's z-score. Statistically significant differences were found between packets for Zr at both the 95% and 99% confidence levels.

Detailed results of the homogeneity tests follow. The probability that the ten packets are the same is tabulated for all oxides/elements whose concentrations are at least 5 times the detection limit. For the three that are possibly heterogeneous, H_a is shown as well for comparison with the standard deviation, which includes both within and between bottle components of variance.

Oxide	Mean *% m/m*	StdDev	Probability homogeneous	H_a
SiO_2	65.12	0.17	0.099	
Al_2O_3	15.75	0.035	0.396	
Fe_2O_3	5.92	0.0098	0.043	0.092
MgO	2.57	0.016	0.115	
CaO	2.90	0.013	0.036	0.048
Na_2O	3.57	0.023	0.074	
K_2O	2.26	0.0089	0.435	
MnO	0.0688	0.0011	0.247	
TiO_2	0.699	0.0037	0.373	
P_2O_5	0.0834	0.0017	0.121	
	$\mu g\ g^{-1}$			
Ba	948.4	8.53	0.262	
Co	21.03	1.12	0.397	
Cr	183.3	1.99	0.269	
Cu	28.09	0.61	0.889	
Ga	17.53	0.68	0.045	1.0
Nb	10.73	0.35	0.698	
Ni	58.99	1.22	0.338	
Rb	56.60	0.51	0.708	
Sr	360.1	1.21	0.616	
V	100.5	2.52	0.977	
Y	19.05	0.48	0.518	
Zn	73.67	1.04	0.849	
Zr	227.4	3.55	0.0072	8.2

Table 1

Results for sample IGI GBPG-1 (garnet-biotite plagiogneiss), submitted to the GeoPT7 round

Round identifier		H1	H1	H2	H3	H4	H5	H6	H7	H8	H9	H9	H10	H10	H11	H12	H13	H14	H14	H15	H16	H16	H17	H18	H19	H19	H20
Technique		X	X	X	X	X	X,IR, T	M,X	A,IR, X	X	X	X	X	X	A,M	G,ISE, X	T,X	X	X	A,I, W	AA,T, X	AA,X	X	X	I	I	X
	codes																										
Data quality		1	1	2	1	2	1	1	2	1	1	2	1	2	2	2	2	1	2	2	1	2	2	2	1	2	2
SiO_2	% m/m	64.84		65.6	65.93	64.96	64.6	65.03	62.54	63.63	65.0		65.22		64.6	64.91	64.96	64.64		65.96	65.06		63.2	64.64			64.27
TiO_2	% m/m	0.707		0.66	0.726	0.712	0.68	0.69	0.679	0.68	0.71		0.67		0.73	0.68	0.69	0.7		0.69	0.69			0.69	0.66		0.68
Al_2O_3	% m/m	15.82		17.4	16.04	15.95	15.8	16.01	15.15	15.50	15.8		16.12		15.9	16.09	15.92	15.83		15.51	15.84		15.91	16.09	16.1		15.69
Fe_2O_3T	% m/m	5.93		6.2	6.15	6.02	1.53	5.95	5.746	6.00	6.04		5.89		6.3	6.04	5.98	6.21		6.15	5.79		6.29	6.15	5.93		5.96
Fe(II)O	% m/m						4.07										4.25			3.92	4.46						
MnO	% m/m	0.07		0.06	0.074	0.071	0.07	0.06	0.067	0.065	0.07		0.073		0.074		0.07	0.07		0.075	0.07		0.084	0.07	0.066		0.06
MgO	% m/m	2.586		1.88	2.61	2.52	2.61	2.64	2.691	2.50	2.59		2.61		2.75	3.07	2.63	2.54		2.63	2.57		2.49	2.6	2.85		2.60
CaO	% m/m	2.898		2.69	2.84	2.85	2.85	2.84	2.672	3.40	2.86		2.86		2.91	2.87	2.85	2.82		2.38	2.8		2.69	2.9	2.71		2.79
Na_2O	% m/m	3.615		2.84	3.67	3.54	3.59	3.55	3.31	3.24	3.54		3.61		3.55	3.66	3.56	3.56		3.50	3.68		3.75	3.54	3.73		3.50
K_2O	% m/m	2.261		1.56	2.18	2.27	2.24	2.27	2.218	2.21	2.26		2.23		2.33	2.1	2.25	2.24		2.14	2.27		2.01	2.2	2.37		2.29
P_2O_5	% m/m	0.085		0.17	0.1	0.08	0.08	0.09	0.071	0.07	0.07		0.076		0.06		0.09	0.08		0.105	0.09			0.08			0.07
H_2O^+	% m/m						1.03																				
CO_2	% m/m						0.15		0.165																		
LOI	% m/m	0.78		0.85	0.64	0.83		0.8	0.67	2.60	0.72		0.83		0.77	0.78	0.77	0.76		0.73	0.62			0.84			
Ag	mg kg^{-1}																			0.3							
As	mg kg^{-1}																			0.0							
Au	mg kg^{-1}																										
B	mg kg^{-1}																										
Ba	mg kg^{-1}	936.4			746	927	907	927		965		1030	836		885.0		913	842.5		997			820	875	863		
Be	mg kg^{-1}							0.98																			
Bi	mg kg^{-1}																			15							
Br	mg kg^{-1}																										
Cd	mg kg^{-1}																										
Ce	mg kg^{-1}					46		104.8					102		99.0		90		103.8	106.4					107		
Cl	mg kg^{-1}																										
Co	mg kg^{-1}		22.1			20	23	20.7					17		21.0		20	16.5		19					19.5		
Cr	mg kg^{-1}	181.4				192	188	207	168.9				166		198.0		192	180.2		190		307			181		
Cs	mg kg^{-1}					3		0.324							0.2				5								
Cu	mg kg^{-1}	28.5				25	30	30.5	28.49				33		33.0			30.7		28.4		34					
Dy	mg kg^{-1}							3.37							3.0					3.14					3.53		
Er	mg kg^{-1}							2.06							1.93					2.02							
Eu	mg kg^{-1}							1.9							1.65					1.61					1.99		
F	mg kg^{-1}															633											
Ga	mg kg^{-1}		18.2		19	19	18	18.9					22				18	18.5									
Gd	mg kg^{-1}							4.65							4.7					3.90							
Ge	mg kg^{-1}					2																					
Hf	mg kg^{-1}						6	6.17							5.7				6.2						7.02		
Hg	mg kg^{-1}																			0.021							
Ho	mg kg^{-1}							0.69							0.65					0.83							
I	mg kg^{-1}																										
In	mg kg^{-1}																										
Ir	mg kg^{-1}																										
La	mg kg^{-1}					49		53.3					57		51.0		109		53.9	56.53					53.7		
Li	mg kg^{-1}							23.5												24.2							
Lu	mg kg^{-1}							0.315							0.28					0.30					0.30		

Table 1: Results submitted to the GeoPT7 round.

Round identifier		H1	H1	H2	H3	H4	H5	H6	H7	H8	H9	H9	H10	H10	H11	H12	H13	H14	H15	H15	H16	H16	H17	H18	H19	H19	H20
Mo	mg kg^{-1}		1.2			1.8		1.55							1.7				6								
N	mg kg^{-1}																										
Nb	mg kg^{-1}	10.8			11	8	10	9.71					0		8.7		12	10.2	8.2					9			
Nd	mg kg^{-1}					29		43.9							42.5		35		41.76						54.5		
Ni	mg kg^{-1}	59.3			62	61	70	58.5		92			59		65.0		64	61.7	59			59					
Os	mg kg^{-1}																										
Pb	mg kg^{-1}	12.8			17	26	14	12.9					29		14.0		16		26								
Pd	mg kg^{-1}																	14.1									
Pr	mg kg^{-1}							12.23							12.0				11.42								
Pt	mg kg^{-1}																										
Rb	mg kg^{-1}	56.1			53	60	58	56		55			56		54.0		59	55.6	50		53	50	51	72.1			
Re	mg kg^{-1}																										
Rh	mg kg^{-1}																										
Ru	mg kg^{-1}																										
S	mg kg^{-1}		48						73.71					90		1139											
Sb	mg kg^{-1}					4.5		0.02							0.06												
Sc	mg kg^{-1}		15.3				14	15.4							15.0			12.6							14.4		
Se	mg kg^{-1}																										
Sm	mg kg^{-1}							7.39							6.75				7.29						7.37		
Sn	mg kg^{-1}							0.56							0.2			1.7	120								
Sr	mg kg^{-1}	360.5			375	388	369	371		376		423	360		357.0		368	376.7	322		407	310	337		474		
Ta	mg kg^{-1}							0.44							0.37				3.5						0.46		
Tb	mg kg^{-1}							0.64							0.58				0.79					0.56			
Te	mg kg^{-1}																										
Th	mg kg^{-1}	9.5			5	12.5	7	12.2							10.4		15										
Tl	mg kg^{-1}					0.6		0.27										9.3					10	11.4			
Tm	mg kg^{-1}														0.30												
U	mg kg^{-1}		2.8			2		0.92							0.8				0.33								
V	mg kg^{-1}		99.6			90	100	104.7	79.84				97		100.0		97	95.9	79		88				98.9		
W	mg kg^{-1}														0.45				0.0								
Y	mg kg^{-1}	19			20	17	15	17		19.5			20		18.0		20	18.3	20.14				16				
Yb	mg kg^{-1}							2.01							1.93				1.98						2.02		
Zn	mg kg^{-1}	73.6			95	81	82	79.8	76.1				78		82.0		81		80.7		39						
Zr	mg kg^{-1}	225.3			229	232	231	242	93.28	236			242		257.0		251	226.6	214			230	210		290		

H73-H76 were submitted too late to contribute to the analysis of assigned values.

Technique codes: A=ICP-AES, AA=atomic absorption, E=emission spectrometry, G=gravimetric, I=INAA, IR=infra red detection, ISE=ion selective electrodes, M=ICP-MS, T=titrimetry, W=wet chemistry, X=XRF

Table 1: Results submitted to the GeoPT7 round.

Round	H21	H21	H22	H23	H24	H25	H26	H27	H28	H29	H30	H31	H32	H32	H33	H34	H35	H36	H36	H37	H38	H39	H40	H41	H42	H43	H43	H44
Technic	X	X	AA	AA,M, W	A,IR, M,X	X	M	AA,M	M,X	A,IR, ISE,M,V	AA,A, IR,ISE	A,X	M	M	T,X	A,M	X	X	X	AA,E, ISE,X	A,M, W,X	X	AA,A, M,T,X	X	X	G,A,T	G,A,T	A,M
Data qu	1	2	2	2	1	1	1	2	1	2	1	2	1	2	1	2	2	1	2	2	2	2	1	1	1	1	2	2
SiO_2	65.5		65.2	65.3	65.65	64.82		66.04	65.3	65.5	65.05	64.92			64.94	60.63	65.25	64.99		66.42	64.95	64.7	65.2	65.97	64.8	64.63		64.5
TiO_2	0.70		0.7	0.684	0.731	0.73			0.68	0.71	0.725	0.695			0.689	0.632	0.69	0.694		0.641	0.7	0.69	0.69	0.73	0.687	0.666		0.71
Al_2O_3	15.95		16.10	15.8	15.38	15.99		16.69	15.8	16.00	15.71	15.97			15.99	14.98	15.83	15.84		15.35	15.95	15.9	15.9	15.96	15.80	15.89		15.43
Fe_2O_3T	6.04		3.54	6.03	6.13	6.2		4.93	5.9	6.00	6.02	6.093			6.068	6.227	6.1	6.025		5.87	6.1	6.34	5.95	6.19	6.0	6.14		6.21
Fe(II)O			2.75	3.61						4.35	3.99				4.23						4.52					4.39		
MnO	0.07		0.09	0.066	0.07	0.08		0.056	0.07	0.071	0.069	0.07			0.07	0.067	0.068	0.066		0.06	0.07	0.068	0.069	0.07	0.07	0.073		0.078
MgO	2.65		2.45	2.55	2.52	2.59		2.42	2.56	2.6	2.57	2.564			2.589	2.503	2.58	2.615		2.55	2.6	2.52	2.59	2.60	2.6	2.62		2.655
CaO	2.86		1.57	2.76	2.84	2.81		2.1	2.77	2.9	3.07	2.827			2.892	3.216	2.91	2.871		2.7	2.86	2.82	2.84	2.84	2.84	2.91		2.89
Na_2O	3.62		3.91	3.64	3.67	3.82		3.45	3.61	3.6	3.58	3.532			3.625	3.457	3.54	3.604		3.44	3.26	3.45	3.41	3.56	3.6	3.59		3.73
K_2O	2.23		2.02	2.19	2.33	2.3		2.2	2.25	2.3	2.28	2.256			2.257	2.081	2.25	2.269		2.15	2.2	2.26	2.23	2.26	2.24	2.23		2.285
P_2O_5	0.08			0.078	0.075	0.08			0.08	0.08	0.065	0.087			0.083	0.064	0.081	0.081		0.066	0.086	0.07	0.078	0.086	0.08	0.078		0.07
H_2O^+											1.18															1.16		
CO_2					0.15						0.02										0.2					0.24		
LOI	0.77			0.741	0.6	0.52			0.93	0.82	0.78	0.668			0.6		0.71	0.694			0.82		0.71	0.68		0.77		0.82
Ag		2						0.8	0.1													6						
As										0.3																		
Au																												
B																				10								
Ba	895				889	976	880.2	941	861	910	833	921	935		901.2	836		952.3		857	884	975	980	826	894	911		920
Be									0.4	0.7	2	0.8				1				1			0.78				0.6	
Bi														0.04														
Br																												
Cd								0.22	0.1					0.22						0.09			0.07					
Ce	95				98.9		108	84		112	105.8		108		71.5	99.96			84.4		98	34	104			114		98
Cl																					320							
Co		18			19.3	22		16.8		20.5	18		19.7							17.1	21	17	18.9		20	25		20.4
Cr	190		2		188	275		155	158	186	178		182		211.6	181.9		207.6		144	179	170	195	197	180	179		183
Cs					0.29		0.31	0.24	0.4	0.3			0.28										0.33					0.35
Cu		25	2		29	26		19.9		30	30		26		28.3	23.81		30.51		35	33	30	31.6		27	29		32
Dy					2.74		3.43	2.45		3.3	3.42		3.3			3.08					1.9		3.4			3.7		3.8
Er					1.85		1.85	1.73		1.95	1.53		2.2			2.02					0.8		2.0			2.6		2.15
Eu					1.61		1.82	1.69		1.8	1.68		1.8			1.98					1.6		1.73			2		2.05
F		900								520	655									545	530							
Ga	18				19.5	17		15.2		19.8			18.4			17.87		18.48		16.4	19		18		18			20.7
Gd					4.72		4.75	5.7		4.3	5.04		4.5			4.67					4		4.8					5
Ge								3.6		1.5				1									0.86					
Hf		7			5.35			4.3		5.9			6.7			4.43					0.3							7
Hg								0.24	0.1	0.01																		
Ho					0.62		0.652	0.54		0.63	0.82		0.69			0.76					0.3		0.63				0.7	0.85
I																												
In										0.05																		
Ir																												
La		90			49.3		53	45.4		53	51.8		54		36.8	50.54			41.1	57	48	10	54			69		48.25
Li									20.5	19.5	18.6										16		20.6			20		22
Lu					0.28		0.307	0.24		0.26	0.35		0.33			0.28					0.1						0.4	0.5

Table 1: Results submitted to the GeoPT7 round.

Round	H21	H21	H22	H23	H24	H25	H26	H27	H28	H29	H30	H31	H32	H32	H33	H34	H35	H36	H36	H37	H38	H39	H40	H41	H42	H43	H43	H44
Mo					1.88	1		1.31	2	1.5																		1.7
N																												
Nb		10			9.31	10	9.21	7.5		10.8			11		10.2	7.42		9.53			10		12		10		8.2	10
Nd		37			40		45.11	33.6		42	46		45			41.68					35	10	44			46		43.75
Ni	55		2		58.2	55		51.5	23.7	60	79			62	57.4			59.55		42.5	67	60	55	55	61	54		60.3
Os																												
Pb		15			13.6	14	14.6	13.14	13.4	15	22		13.6		17.4			12.12		15.27	10	40	14		16			14.25
Pd					4E-04			0.8																				
Pr		16			10.6		11.94	10.61		11.2	10.8		12			11.12					10	10	12			13		11.05
Pt					7E-04																							
Rb	64				58	54	50.3	41.49		55.5	59		57.1		54.8	51.85		56.53		60.93	46	70	56	67	57			55.2
Re																												
Rh																												
Ru								0.04																				
S										60																		
Sb			1		0.05			0.04	0.1																		123	
Sc					13.6	16			13.5	14		13.13				12.6		15.1		16.8	7		14.4		14	15		
Se								4.1	1													5						
Sm					6.22		6.83	5.5		6.7	8.66		7			6.49					5.4		6.7			7.5		6.9
Sn								0.4	0.7	0.5										2								
Sr	360				385	364	312.6	356	375	360	364	369	376		358.7	342.4		357.3		364	324	344	360	400	360	365		350.5
Ta					0.37		0.4	0.25		0.46						0.37					0.4							
Tb					0.6		0.596	0.52		0.55	0.84		0.56			0.69					0.5		0.58				0.8	0.85
Te								0.46																				
Th		10			10.8	12	13.05	27.8	10.2	11.1			11.9			12.23		11.24		10.5	8.4		12					10.5
Tl								0.34	0.3	0.29			0.35										0.3					
Tm					0.27		0.286	0.24		0.25	0.46		0.31								0.1		0.33				0.4	0.45
U					0.9	1.6	0.818	7.55	0.6	0.82			0.9							1.6	0.7		0.74					
V	99				95.8	101		80.2	57.8	102	109		102		103.9			114.2		72	95	100	98		99	98		97.5
W								0.28	0.3	0.2				1														
Y		16			17.4	20		14.5	12.2	17	18.6	17.46	18.8		18.3	18.18		18.31		20.27	13	10	22		20	19		17
Yb					1.87		1.85	1.7		2.1	2.21		2.2			1.92					0.6		2.0				2.2	2.35
Zn	74				91	75		75	68.4	80	76	86.2	84.5		79.9	69.7		82.27		85	85	80	81	75	80	80		75
Zr	250				268	242		198	3	224		251	280		231.5	202.2		230.4		237.4	214	210			246	227		229.5
H73-H7																												
Technic																												

Table 1: Results submitted to the GeoPT7 round.

Round	H45	H46	H47	H48	H49	H49	H50	H51	H52	H53	H54	H55	H56	H57	H58	H59	H60	H61	H62	H63	H63	H64	H64	H65	H66	H66	H67	H68
Technic	I	AA	A,W	A,X	AA,A, ISE,M,X	AA,A, ISE,M,X	AA,A, AF	AA,W	AA,A, X	X	T X	M,X	X	X	I	AA,M	X	A	A,ISE, M,X	A,IR, M,T,X	A,IR, M,T,X	M	M	A,ISE, X	M	M	M	G,X
Data qu	1	2	1	2	1	2	1	1	2	1	2	1	1	2	2	1	1	1	2	1	2	1	2	2	1	2	1	1
SiO_2		64.46	64.22	64.3	64.92			65.23	64.85	65.6	64.89	65.2	65.73	64.91				64.44	65.2	64.58				61.29				64.82
TiO_2			0.70	0.69	0.713		0.70	0.71	0.686	0.68	0.678	0.69	0.69	0.7			0.73	0.68	0.682	0.69				0.684		0.67		0.701
Al_2O_3		15.66	15.73	16	16		15.85	16.05	16.15	15.7	15.85	15.84	15.97	15.91		19		15.54	15.76	15.86				15.84				15.89
Fe_2O_3T	5.84	6.13	6.22	5.99	6.09		5.81	1.23	6.08	5.92	5.998	5.88	6.12	5.94	5.91		4.58	6.03	5.89	6.07				6.074				6.12
Fe(II)O					3.77			4.38	4.25		3.7								4.2		4.19							
MnO		0.069	0.05	0.069		0.063	0.72	0.063	0.069	0.067	0.069	0.07	0.068	0.078		0.06	0.08	0.07	0.07	0.06				0.068		0.066		0.068
MgO		2.21	2.80	2.63		2.675	2.55	2.44	2.66	2.54	2.449	2.54	2.63	2.5		1.08		2.57	2.70	2.6				2.569				2.63
CaO		2.53	2.69	2.86	2.914		2.74	2.65	2.91	2.84	2.817	2.88	2.88	2.81			2.69	2.74	2.99	2.9				2.880				2.84
Na_2O	3.6	3.32	4.14	3.69	3.51		3.35	3.72	3.75	3.21	3.477	3.61	3.53	3.4	3.41			3.47	3.65	3.62				3.593				3.56
K_2O		2.02	2.44	2.22	2.19		2.33	2.17	2.17	2.28	2.282	2.25	2.27	2.26			1.99	2.21	2.19	2.35				2.227				2.18
P_2O_5				0.081		0.064		0.10	0.1	0.083	0.072	0.08	0.085	0.07				0.08	0.07	0.07				0.076				0.064
H_2O^+						0.9		0.91	0.19										1.2		0.78							
CO_2								0.10											0.01		0.05							0.103
LOI		0.505	0.73	0.29		0.71		0.89	0.65	0.85	0.735	0.75	0.83	0.86					0.65	0.71								0.98
Ag	0.045					0.09	0.4									0.3												
As	0.16					3.8				0																		
Au							0.021	0.024																				
B						2.2																						
Ba	909			910		957			932	906.9	891.3	912	897	985	992	588.2		885	931		919	910		930.1	916		843	856
Be									0.73							0.82			2.1									
Bi							1									0.1												
Br	0.15																									0.029		
Cd						0.057	0.12																			0.031		
Ce	106.8			82.9	110				105		70.4	98.1	80					108.5	115.6	103.2		106		120.2	109		105	88
Cl																												
Co	19.9	20		17		21	18		19		16.5		24	21	18.4	19.2		17	17		18.73			19.02	21.1		17.4	24
Cr	190	208		207		143	161		170	182.3	190.2	165	195	150	178.5	173.4	180	179	196		181.9			209.50	192			162
Cs	0.31				0.36							0.33			0.31	0.3			0.3	0.32		0.311			0.34			
Cu		32		30		33	31		31	27.84	30.9	27		30		30	38.3	30	35		27.8			31.74	30.4			35
Dy				2.3	3.25				3.19			3.69						3.3	3.3	3.55		3.05			3.31		2.98	
Er				1.5	2.2				2.36			2.18						2.1	2.2	2.06		1.85			1.98		2.02	
Eu	1.8			1.5	1.93				1.62			1.91			1.88			1.82	1.74	1.78		1.75			1.72		1.77	
F						600													535					293				
Ga				19					17.8	18.9	18.7	19	19			18.8	16.5		17		18.7				20.1		17.9	18
Gd				3.8	4.86				4.87			5.06						4.2	5.8	4.74		4.56			4.82		4.92	
Ge					1.09														3.1							1.12		
Hf	6.68			8	5.5				6		5	6.37			6.54				7.7				2.30		4.11		5.71	
Hg							0.011									0.001												
Ho					0.7				0.63			0.76			0.7			0.76	0.75	0.68		0.611			0.64		0.64	
I																												
In																												
Ir																										0.036		
La	50			41.5	55.2				59	44.86	35.1	52.6			53.6			55.1	55.3	53.99		52.9			53.7			34
Li		19			22		17		16							21.7		26	20		22.3					21.1		
Lu					0.3				0.33			0.34			0.353			0.32	0.34	0.32		0.283			0.29		0.27	

Table 1: Results submitted to the GeoPT7 round.

Round	H45	H46	H47	H48	H49	H49	H50	H51	H52		H54	H55	H56	H57	H58	H59	H60	H61	H62	H63	H63	H64	H64	H65	H66	H66	H67	H68
Mo	1.7					1.6	0.9												1.7						1.68			
N																												
Nb				9		7			8	10.92	10	9.86	10						10	10.76					10.2		8.81	
Nd	46			35	45				40.5	24.1	28.2	40.3			45.3			45	44.6	43.51		43.4			43.4		43.3	
Ni	60	61		61		73	61		52	57.47	57.2	58	64	77	76	58.9	46.8	58	66		56.26			58.48	61.7			60
Os																												
Pb				14		10	5		12.4	16.12	13.3	13.55	15	16		15.5	19.4		15		13.86	13.9			12.6			15
Pd							0.08	0.017																				
Pr				9	12.9				10.1			10.68						10.9	11.2	12.26		11.8			11.9		11.9	
Pt							0.065																					
Rb	55.2			59	54		55.2		58	56.7	55.3	55	48		53	17.1	54.3		58	60.38		55.1			57.7			71
Re																												
Rh																												
Ru																												
S										0.01																		
Sb	0.020																											
Sc	13.5			12.51		13	14			13.7	13.4	15.8	13		14.14			13	1.7		14				14.3			14
Se																												
Sm	6.65			5.9	7.16				6.3		3.5	7.16			6.79			7.1	7.7	6.72		6.75			7.25		6.74	
Sn						0.9			1.2	0.21											0.7							
Sr	367			352	365		350		353	364.8	365.5	356	359	423		242.2	388.6	357	362	389.9		365		365.7	387		366	366
Ta	0.4					0.56						0.42			0.4				0.27						0.38			
Tb	0.52				0.64				0.59			0.66			0.61				0.7	0.6		0.539			0.61		0.54	
Te																												
Th	12.1			8.8		17.4			11.3	10.73	9.6	12.1	11	10	13.58				11.4	12.14		11.6			12.1		11.7	11
Tl											1.3					0.28					0.4					0.47		
Tm					0.34				0.35			0.33							0.3			0.258			0.29			
U	0.92					0.84				1.33		0.89	1.4		0.99	0.67			0.88	0.86		0.808			0.91			
V		98		102		100	95		96	94	93.9	101	94	220		95		89	107		87.88			96.72	102			87
W	0.35				0.23														0.4		0.19				0.78			
Y				11.4		26	8		17	18.52	15.7	20	13				16.6	17	19	19.27		16.6			17.6			18
Yb	2.2			1.39	2.05				1.93			2.08			2.2			1.9	2.2	1.98		1.90			2.02		2.05	
Zn	82	118		77	87	139	81		82	78.15	80.9	75	81	80		83.6	83.9	77	75		85.38			178.5	73.4			81
Zr	250			234		243	12		235	236.5	229.4	239	225	370	200			171	242				94.6	23.88	161			265
H73-H7																												
Technic																												

Table 1: Results submitted to the GeoPT7 round.

Round	H69	H70	H71	H71	H72	H73	H74	H75	H76
Technic	AA,A, M,W	AA,A	I	1	X	X	AA,M, ISE	A	A,T,X
Data qu	1	1	1	2	1	1	2	2	2
SiO_2	64.38	65.53			64.51	65.25	64.94	65.00	65.15
TiO_2	0.71	0.71			0.79	0.72	0.696	0.67	0.689
Al_2O_3	16.11	15.84			16.01	15.66	15.98	15.60	15.75
Fe_2O_3T	6.47	6.08		5.93	6.87		6.174	6.32	5.896
Fe(II)O	4.08					5.38			4.02
MnO	0.06	0.07			0.07	0.067	0.064	0.07	0.067
MgO	2.60	2.61			2.89	2.76	2.518	2.52	2.557
CaO	2.94	2.86		3.05	3.02	2.94	2.895	2.97	2.843
Na_2O	3.49	3.64		3.42	3.42	3.76	3.645	3.10	3.592
K_2O	2.22	2.26		2.16	2.26	2.40	2.253	2.35	2.295
P_2O_5	0.10	0.10			0.11	0.115	0.084	0.01	0.072
H_2O^+	1.14					0.91			
CO_2	0.13								0.05
LOI	0.87	0.75				0.80	0.735	1.09	0.572
Ag	0.05							0.8	
As					3		1	14.8	2
Au									
B								13.3	
Ba	921	918		954	986		860	983.0	945
Be								1.3	
Bi								38.4	16.5
Br									
Cd								7.9	3
Ce	107		100.6		65			142.0	101.5
Cl									
Co	19.6	25		18.9		47	22	24.8	16
Cr	186	167		173	150	170	170	209.0	188
Cs	0.42								
Cu	30.8				35		39	36.8	24
Dy	3.37								
Er	1.87								
Eu	1.98		1.643					1.5	
F	570						228		
Ga	20				26		23		27
Gd	4.4								12.5
Ge	1.09						4	16.1	
Hf	6.13			6.35					3
Hg									
Ho	0.62		0.84						
I									
In									0.5
Ir									
La	54.4		52.83		31			52.7	46.5
Li	22						20	14.5	14.5
Lu	0.31		0.31						

Table 1: Results submitted to the GeoPT7 round.

Round	H69	H70	H71	H71	H72	H73	H74	H75	H76
Mo	1.71							16.8	
N									
Nb	9.01				9			24.4	
Nd	46.6		41.11						23.5
Ni	60.6	54			74	245	58	60.6	33
Os									
Pb	14.1				15			62.9	4
Pd									0.5
Pr	12.4								
Pt									
Rb	60.3			64.8	76				
Re									
Rh									
Ru									
S	110								52
Sb								0.0	
Sc				13.8					10
Se	0.08							0.0	
Sm	7.17		6.55					8.1	
Sn	0.64							15.6	1
Sr	351	362			355			333.0	440
Ta	0.41							1.6	
Tb	0.57		0.69						
Te									
Th	12.8			11.6	11		21		
Tl									
Tm	0.3								
U	0.92				3		100		
V	95.3	102			95	40			72.5
W	0.19							10.9	
Y	17.7	20			12	35	13	10.8	17.5
Yb	2.28		2.07						
Zn	82.2	84			88		84	96.6	43
Zr	237	255			233	118		6.3	267
H73-H7 Technic									

Table 2 GeoPT7

Assigned values and robust statistical analysis of contributed data

		Xa	Ha	Robust s	Ratio s/Ha			Xa	Ha	Robust s	Ratio s/Ha
SiO_2	% m/m	64.946	0.693	0.071	0.103	Hf	mg kg^{-1}	6.07	0.37	0.20	0.53
TiO_2	% m/m	0.6941	0.015	0.0024	0.1667	Ho	mg kg^{-1}	0.69	0.06	0.02	0.34
Al_2O_3	% m/m	15.90	0.210	0.020	0.10	La	mg kg^{-1}	52.95	2.33	0.77	0.33
Fe_2O_3T	% m/m	6.028	0.092	0.020	0.217	Li	mg kg^{-1}	20.97	1.06	0.72	0.68
Fe(II)O	% m/m	4.195	0.068	0.066	0.982	Lu	mg kg^{-1}	0.31	0.03	0.01	0.25
MnO	% m/m	0.070	0.002	0.0003	0.177	Mo	mg kg^{-1}	1.70	0.13	0.05	0.43
MgO	% m/m	2.60	0.045	0.009	0.20	Nb	mg kg^{-1}	9.93	0.56	0.22	0.38
CaO	% m/m	2.80	0.048	0.014	0.30	Nd	mg kg^{-1}	43.30	1.96	0.68	0.34
Na_2O	% m/m	3.60	0.059	0.018	0.30	Ni	mg kg^{-1}	59.6	2.6	0.8	0.3
K_2O	% m/m	2.20	0.039	0.008	0.20	Pb	mg kg^{-1}	14.10	0.76	0.24	0.31
P_2O_5	% m/m	0.0799	0.0023	0.0015	0.6559	Pr	mg kg^{-1}	11.45	0.63	0.21	0.33
LOI	% m/m	0.751	0.016	0.015	0.936	Rb	mg kg^{-1}	56.24	2.45	0.65	0.27
						Sc	mg kg^{-1}	13.93	0.75	0.21	0.28
Ba	mg kg^{-1}	908.0	26.1	7.0	0.3	Sm	mg kg^{-1}	6.79	0.41	0.10	0.25
Be	mg kg^{-1}	0.90	0.07	0.06	0.85	Sr	mg kg^{-1}	363.5	12.0	2.3	0.2
Ce	mg kg^{-1}	103.2	4.1	1.2	0.3	Ta	mg kg^{-1}	0.40	0.04	0.01	0.29
Co	mg kg^{-1}	19.5	1.0	0.3	0.3	Tb	mg kg^{-1}	0.60	0.05	0.02	0.33
Cr	mg kg^{-1}	181.4	6.6	2.6	0.4	Th	mg kg^{-1}	11.23	0.62	0.23	0.37
Cs	mg kg^{-1}	0.32	0.03	0.01	0.26	Tm	mg kg^{-1}	0.30	0.03	0.01	0.35
Cu	mg kg^{-1}	30.0	1.4	0.4	0.3	U	mg kg^{-1}	0.90	0.07	0.03	0.39
Dy	mg kg^{-1}	3.26	0.22	0.07	0.33	V	mg kg^{-1}	96.5	3.9	1.0	0.3
Er	mg kg^{-1}	2.01	0.14	0.05	0.35	Y	mg kg^{-1}	18.00	0.93	0.32	0.34
Eu	mg kg^{-1}	1.79	0.13	0.03	0.23	Yb	mg kg^{-1}	2.03	0.15	0.04	0.24
Ga	mg kg^{-1}	18.6	1.0	0.2	0.2	Zn	mg kg^{-1}	80.3	3.3	0.7	0.2
Gd	mg kg^{-1}	4.74	0.30	0.09	0.30	Zr	mg kg^{-1}	231.8	8.2	3.3	0.4

Xa = assigned value, s = standard deviation of submitted results calculated using robust statistics,
Ha = target precision calculated using a modified version of the Horwitz function.

Table 3 GeoPT7 z-scores

Table 3																	
Z-scores for data submitted to the GeoPT7 round (IGI GBPG-1 garnet-biotite plagiogneiss).																	
Round identifier		H1	H1	H2	H3	H4	H5	H6	H7	H8	H9	H9	H10	H10	H11	H12	H13
Technique		X	X	X	X	X	X,IR,	M,X	A,IR,	X	X	X	X	X	A,M	G,ISE,	T,X
code							T		X							X	
Data quality		1	1	2	1	2	1	1	2	1	1	2	1	2	2	2	2
SiO_2	% m/m	-0.16		0.47	1.42	0.01	-0.50	0.12	-1.74	-1.90	0.08		0.40		-0.25	-0.03	0.01
TiO_2	% m/m	0.88		-1.16	2.17	0.61	-0.96	-0.28	-0.50	-0.96	1.08		-1.64		1.22	-0.48	-0.14
Al_2O_3	% m/m	-0.37		3.58	0.67	0.12	-0.48	0.52	-1.79	-1.91	-0.48		1.05		0.00	0.45	0.05
Fe_2O_3T	% m/m	-1.07		0.93	1.32	-0.05	-48.90	-0.85	-1.53	-0.31	0.13		-1.50		1.48	0.06	-0.26
Fe(II)O	% m/m						-1.85										0.41
MnO	% m/m	0.00		-2.39	1.91	0.24	0.00	-4.79	-0.69	-2.39	0.00		1.44		0.96		0.00
MgO	% m/m	-0.31		-7.99	0.22	-0.89	0.22	0.89	1.01	-2.22	-0.22		0.22		1.67	5.22	0.33
CaO	% m/m	2.04		-1.15	0.83	0.52	1.04	0.83	-1.33	12.51	1.25		1.25		1.15	0.73	0.52
Na_2O	% m/m	0.25		-6.40	1.18	-0.51	-0.17	-0.84	-2.44	-6.06	-1.01		0.17		-0.42	0.51	-0.34
K_2O	% m/m	1.56		-8.19	-0.51	0.90	1.02	1.79	0.23	0.26	1.54		0.77		1.66	-1.28	0.64
P_2O_5	% m/m	2.18		19.27	8.60	0.02	0.04	4.32	-1.84	-4.24	-4.24		-1.67		-4.26		2.16
LOI	% m/m	1.85		3.16	-7.08	2.52		3.12	-2.58	117.92	-1.98		5.04		0.61	0.92	0.61
Ba	mg kg^{-1}	1.09			-6.22	0.36	-0.04	0.73		2.19		2.34	-2.76		-0.44		0.10
Be	mg kg^{-1}							1.09									
Ce	mg kg^{-1}					-6.96		0.38					-0.30		-0.51		-1.61
Co	mg kg^{-1}		2.65			0.27	3.56	1.25					-2.47		0.77		0.27
Cr	mg kg^{-1}	0.00				0.80	0.99	3.86	-0.94				-2.32		1.25		0.80
Cs	mg kg^{-1}					44.10		0.13							-1.97		
Cu	mg kg^{-1}	-1.04				-1.74	0.00	0.35	-0.52				2.09		1.04		
Dy	mg kg^{-1}							0.49							-0.60		
Er	mg kg^{-1}							0.33							-0.28		
Eu	mg kg^{-1}							0.83							-0.54		
Ga	mg kg^{-1}		-0.38		0.45	0.23	-0.59	0.35					3.59				-0.30
Gd	mg kg^{-1}							-0.29							-0.06		
Hf	mg kg^{-1}						-0.18	0.28							-0.49		
Ho	mg kg^{-1}							0.08							-0.30		
La	mg kg^{-1}					-0.85		0.15					1.74		-0.42		12.03
Li	mg kg^{-1}							2.39									
Lu	mg kg^{-1}							0.07							-0.55		
Mo	mg kg^{-1}		-3.98			0.40		-1.19							0.00		
Nb	mg kg^{-1}	1.55			1.90	-1.72	0.12	-0.39					-17.66		-1.09		1.84
Nd	mg kg^{-1}					-3.64		0.31							-0.20		-2.11
Ni	mg kg^{-1}	-0.11			0.93	0.27	4.04	-0.42		12.58			-0.23		1.05		0.86
Pb	mg kg^{-1}	-1.72			3.83	7.86	-0.13	-1.58					19.68		-0.07		1.25
Pr	mg kg^{-1}							1.23							0.43		
Rb	mg kg^{-1}	-0.06			-1.32	0.77	0.72	-0.10		-0.50			-0.10		-0.46		0.58
Sc	mg kg^{-1}		1.83				0.09	1.96							0.71		
Sm	mg kg^{-1}							1.47							-0.05		
Sr	mg kg^{-1}	-0.25			0.96	1.02	0.46	0.63		1.05		2.49	-0.29		-0.27		0.19
Ta	mg kg^{-1}							1.09							-0.41		
Tb	mg kg^{-1}							0.77							-0.19		
Th	mg kg^{-1}	-2.77			-9.98	1.02	-6.78	1.55							-0.67		3.02
Tm	mg kg^{-1}														0.00		
U	mg kg^{-1}		25.98			7.52		0.27							-0.68		
V	mg kg^{-1}		0.80			-0.84	0.91	2.12	-2.15				0.13		0.45		0.07
Y	mg kg^{-1}	1.07			2.15	-0.54	-3.22	-1.07		1.61			2.15		0.00		1.07
Yb	mg kg^{-1}							-0.15							-0.35		
Zn	mg kg^{-1}	-2.01			4.44	0.11	0.52	-0.14	-0.63				-0.68		0.26		0.11
Zr	mg kg^{-1}	-0.79			-0.34	0.02	-0.09	1.25	-8.48	0.52			1.25		1.55		1.18

Table 3 GeoPT7 z-scores

Table 3																	
Round ic	H14	H14	H15	H16	H16	H17	H18	H19	H19	H20	H21	H21	H22	H23	H24	H25	H26
Techniqu	X	X	A,I,W	AA,T,	AA,X	M,X	X	I	I	X	X	X	AA	AA,M,	A,IR,	X	M
code				X										W	M,X		
Data qua	1	2	2	1	2	2	2	1	2	2	1	2	2	2	1	1	1
SiO_2	-0.44		0.73	0.16		-1.26	-0.22			-0.49	0.80		0.18	0.26	1.02	-0.18	
TiO_2	0.40		-0.14	-0.28			-0.14	-2.33		-0.48	0.40		0.20	-0.35	2.51	2.45	
Al_2O_3	-0.33		-0.93	-0.29		0.02	0.45	0.95		-0.50	0.24		0.48	-0.24	-2.48	0.43	
Fe_2O_3T	1.97		0.66	-2.59		1.42	0.66	-1.07		-0.37	0.13		-13.52	0.01	1.10	1.87	
Fe(II)O			-2.03	3.92									-10.69	-4.33			
MnO	0.00		1.20	0.00		3.35	0.00	-1.91		-2.39	0.00		4.79	-0.96	0.00	4.79	
MgO	-1.33		0.33	-0.67		-1.22	0.00	5.55		0.00	1.11		-1.67	-0.56	-1.78	-0.22	
CaO	0.42		-4.38	0.00		-1.15	1.04	-1.88		-0.10	1.25		-12.82	-0.42	0.83	0.21	
Na_2O	-0.67		-0.84	1.35		1.26	-0.51	2.19		-0.84	0.34		2.61	0.34	1.18	3.71	
K_2O	1.02		-0.77	1.79		-2.43	0.00	4.35		1.15	0.77		-2.30	-0.13	3.33	2.56	
P_2O_5	0.04		5.37	4.32			0.02			-2.12	0.04			-0.41	-2.10	0.04	
LOI	0.57		-0.67	-8.35			2.84				1.21			-0.32	-9.63	-14.73	
Ba	-2.51		1.71			-1.69	-0.63	-1.73			-0.50				-0.73	2.61	-1.07
Be																	
Ce		0.07	0.38					0.92			-2.00				-1.05		1.17
Co	-2.97		-0.23					0.04				-0.73			-0.16	2.55	
Cr	-0.18		0.65		9.47			-0.06			1.29		-13.52		0.99	14.11	
Cs		77.02													-0.99		-0.33
Cu	0.49		-0.56		1.39							-1.74	-9.73		-0.70	-2.78	
Dy			-0.28					1.22							-2.39		0.76
Er			0.03												-1.12		-1.12
Eu			-0.69					1.52							-1.38		0.22
Ga	-0.07										-0.59				0.97	-1.64	
Gd			-1.40												-0.06		0.04
Hf		0.18						2.58				1.26			-1.93		
Ho			1.25												-1.12		-0.57
La		0.20	0.77					0.32				7.95			-1.57		0.02
Li			1.52														
Lu			-0.22					-0.44							-1.11		-0.20
Mo			17.13												1.43	-5.58	
Nb	0.48		-1.54				-0.83					0.06			-1.10	0.12	-1.28
Nd			-0.39					5.70				-1.60			-1.68		0.92
Ni	0.82		-0.12		-0.12						-1.78		-11.18		-0.54	-1.78	
Pb		0.00	7.86									0.59			-0.66	-0.13	0.66
Pr			-0.02									3.58			-1.34		0.77
Rb	-0.26		-1.27		-0.66	-1.27	-1.07	6.47			3.16				0.72	-0.91	-2.42
Sc	-1.78							0.62							-0.44	2.76	
Sm			0.61					1.42							-1.40		0.10
Sr	1.10		-1.73		1.82	-2.23	-1.11		4.62		-0.29				1.80	0.04	-4.25
Ta			42.21						0.82						-0.82		0.00
Tb			1.83					-0.77							0.00		-0.08
Th		-1.55					-0.99	0.27				-0.99			-0.69	1.23	2.91
Tm			0.52												-1.04		-0.49
U															0.00	9.57	-1.12
V	-0.15		-2.25		-1.09			0.62			0.65				-0.18	1.16	
Y	0.32		1.15				-1.07					-1.07			-0.64	2.15	
Yb			-0.18					-0.08							-1.11		-1.25
Zn		-0.30	0.07		-6.22						-1.89				3.24	-1.59	
Zr	-0.63		-1.09			-0.11	-1.33		3.57		2.23				4.44	1.25	

Table 3 GeoPT7 z-scores

Table 3																	
Round Ic	H27	H28	H29	H30	H31	H32	H32	H33	H34	H35	H36	H36	H37	H38	H39	H40	H41
Techniqu	AA,M	M,X	A,IR,	AA,A,	A,X	M	M	T,X	A,M	X	X	X	AA,E,	A,M,	X	AA,A,	X
code			ISE,M,V	IR,ISE									ISE,X	W,X		M,T,X	
Data qua	2	1	2	1	2	1	2	1	2	2	1	2	2	2	2	1	1
SiO_2	0.79	0.51	0.40	0.15	-0.02			-0.01	-3.11	0.22	0.07		1.06	0.00	-0.18	0.37	1.48
TiO_2		-0.96	0.54	2.11	0.03			-0.35	-2.12	-0.14	0.00		-1.81	0.20	-0.14	-0.28	2.45
Al_2O_3	1.88	-0.48	0.24	-0.91	0.15			0.41	-2.19	-0.17	-0.31		-1.31	0.12	0.00	0.00	0.29
Fe_2O_3T	-5.97	-1.40	-0.15	-0.09	0.35			0.43	1.08	0.39	-0.04		-0.86	0.39	1.69	-0.85	1.76
Fe(II)O			1.15	-3.03				0.52						2.40			
MnO	-3.35	0.00	0.24	-0.48	-0.12			0.14	-0.72	-0.48	-2.06		-2.39	0.00	-0.48	-0.48	0.00
MgO	-2.00	-0.89	0.00	-0.67	-0.40			-0.24	-1.08	-0.22	0.33		-0.56	0.00	-0.89	-0.22	0.00
CaO	-7.30	-0.63	1.04	5.63	0.28			1.92	4.34	1.15	1.48		-1.04	0.63	0.21	0.83	0.83
Na_2O	-1.26	0.17	0.00	-0.34	-0.57			0.42	-1.20	-0.51	0.07		-1.35	-2.86	-1.26	-3.20	-0.67
K_2O	0.00	1.28	1.28	2.05	0.72			1.46	-1.52	0.64	1.77		-0.64	0.00	0.77	0.77	1.54
P_2O_5		0.04	0.02	-6.37	1.60			1.33	-3.40	0.24	0.30		-2.97	1.30	-2.12	-0.81	2.61
LOI		11.42	2.20	1.85	-2.65			-9.63		-1.31	-3.64			2.20		-2.61	-4.53
Ba	0.63	-1.80	0.04	-2.88	0.25	1.04		-0.26	-1.38		1.70		-0.98	-0.46	1.29	2.76	-3.15
Be		-6.84	-1.37	15.04	-0.68				0.68				0.68			-1.64	
Ce	-2.34		1.07	0.63		1.16		-7.72	-0.40			-2.29		-0.64	-8.42	0.19	
Co	-1.34		0.52	-1.47		0.24							-1.19	0.77	-1.24	-0.56	
Cr	-1.99	-3.53	0.35	-0.51		0.09		4.55	0.04		3.95		-2.82	-0.18	-0.86	2.05	2.35
Cs	-1.32	2.63	-0.33			-1.32										0.33	
Cu	-3.51		0.00	0.00		-2.78		-1.18	-2.15		0.35		1.74	1.04	0.00	1.11	
Dy	-1.86		0.08	0.72		0.17			-0.42					-3.12		0.63	
Er	-0.98		-0.22	-3.33		1.29			0.03					-4.18		-0.09	
Eu	-0.38		0.03	-0.84		0.07			0.72					-0.73		-0.46	
Ga	-1.76		0.64			-0.18			-0.36		-0.09		-1.13	0.23		-0.59	
Gd	1.61		-0.73	1.01		-0.79			-0.11					-1.23		0.21	
Hf	-2.39		-0.22			1.72			-2.21					-7.79			
Ho	-1.25		-0.48	2.32		0.08			0.65					-3.32		-0.95	
La	-1.62		0.01	-0.49		0.45		-6.93	-0.52			-2.54	0.87	-1.06	-9.22	0.45	
Li		-0.44	-0.69	-2.23										-2.34		-0.35	
Lu	-1.22		-0.89	1.24		0.57			-0.55					-3.57			
Mo	-1.55	2.39	-0.80														
Nb	-2.16		0.77			1.90		0.48	-2.23		-0.71			0.06		3.68	
Nd	-2.47		-0.33	1.37		0.87			-0.41					-2.11	-8.48	0.36	
Ni	-1.57	-13.93	0.08	7.53			0.47	-0.85			-0.02		-3.32	1.44	0.08	-1.78	-1.78
Pb	-0.63	-0.92	0.59	10.43		-0.66		4.36			-2.61		0.77	-2.71	17.10	-0.13	
Pr	-0.66		-0.20	-1.02		0.87			-0.26					-1.14	-1.14	0.87	
Rb	-3.01		-0.15	1.13		0.35		-0.59	-0.89		0.12		0.96	-2.09	2.81	-0.10	4.39
Sc		-0.58	0.05		-0.53				-0.89		1.56		1.91	-4.62		0.62	
Sm	-1.58		-0.11	4.59		0.52			-0.37					-1.71		-0.22	
Sr	-0.31	0.96	-0.15	0.04	0.23	1.05		-0.40	-0.88		-0.52		0.02	-1.65	-0.81	-0.29	3.05
Ta	-2.04		0.82						-0.41					0.00			
Tb	-0.77		-0.48	4.63		-0.77			0.87					-0.96		-0.39	
Th	13.27	-1.65	-0.11			1.07			0.80		0.01		-0.59	-2.27		1.23	
Tm	-1.04		-0.87	5.56		0.35								-3.48		1.04	
U	45.46	-4.10	-0.55			0.00							4.79	-1.37		-2.19	
V	-2.10	-9.97	0.71	3.23		1.42		1.91			4.57		-3.16	-0.19	0.45	0.39	
Y	-1.88	-6.22	-0.54	0.64	-0.29	0.86		0.32	0.10		0.33		1.22	-2.68	-4.29	4.29	
Yb	-1.14		0.23	1.22		1.15			-0.38					-4.90		-0.22	
Zn	-0.79	-3.58	-0.04	-1.29	0.89	1.28		-0.11	-1.59		0.60		0.71	0.71	-0.04	0.22	-1.59
Zr	-2.07	-28.01	-0.47		1.18	5.91		-0.03	-1.81		-0.17		0.35	-1.09	-1.33		

Table 3 GeoPT7 z-scores

Table 3																	
Round Ic	H42	H43	H43	H44	H45	H46	H47	H48	H49	H49	H50	H51	H52	H53	H54	H55	H56
Techniqu	X	G,A,T	G,A,T	A,M	I	AA	A,W	A,X	AA,A,	AA,A,	AA,AF,	AA,W	AA,A,	X	T,X	M,X	X
code									IISE,M,X	ISE,M,X	A		X				
Data qua	1	1	2	2	1	2	1	2	1	2	1	1	2	1	2	1	1
SiO_2	-0.21	-0.46		-0.32		-0.35	-1.05	-0.47	-0.04			0.41	-0.07	0.94	-0.04	0.37	1.13
TiO_2	-0.49	-1.92		0.54			0.40	-0.14	1.29		0.40	1.08	-0.28	-0.96	-0.55	-0.28	-0.28
Al_2O_3	-0.48	-0.05		-1.13		-0.57	-0.81	0.24	0.48		-0.24	0.72	0.60	-0.95	-0.12	-0.29	0.33
Fe_2O_3T	-0.31	1.21		0.99	-2.05	0.55	2.08	-0.21	0.67		-2.37	-52.16	0.28	-1.18	-0.17	-1.61	1.00
Fe(II)O		2.88							-6.29			2.74	0.41		-3.66		
MnO	0.00	1.44		1.91		-0.24	-9.57	-0.24		-1.68	311.17	-3.35	-0.24	-1.44	-0.24	0.00	-0.96
MgO	0.00	0.44		0.61		-4.33	4.44	0.33		0.83	-1.11	-3.55	0.67	-1.33	-1.68	-1.33	0.67
CaO	0.83	2.29		0.94		-2.81	-2.29	0.63	2.38		-1.25	-3.13	1.15	0.83	0.18	1.67	1.67
Na_2O	0.00	-0.17		1.09	0.00	-2.36	9.10	0.76	-1.52		-4.21	2.02	1.26	-6.57	-1.04	0.17	-1.18
K_2O	1.02	0.77		1.09		-2.30	6.14	0.26	-0.26		3.33	-0.77	-0.38	2.05	1.05	1.28	1.79
P_2O_5	0.04	-0.81		-2.12				0.24		-3.40		8.60	4.30	1.33	-1.69	0.04	2.18
LOI		1.21		2.20		-7.84	-1.34	-14.70		-1.31		8.86	-3.22	6.31	-0.51	-0.06	5.04
Ba	-0.54	0.11		0.23	0.04			0.04		0.94			0.46	-0.04	-0.32	0.15	-0.42
Be			-2.05										-1.16				
Ce		2.62		-0.64	0.87			-2.47	1.65				0.22		-3.99	-1.25	-5.65
Co	0.54	5.56		0.47	0.44	0.27		-1.24		0.77	-1.47		-0.23		-1.49		4.56
Cr	-0.21	-0.36		0.12	1.29	2.00		1.93		-2.90	-3.08		-0.86	0.13	0.66	-2.47	2.05
Cs				0.49	-0.33				1.32							0.33	
Cu	-2.09	-0.70		0.70		0.70		0.00		1.04	0.70		0.35	-1.50	0.31	-2.09	
Dy		2.00		1.23				-2.20	-0.06				-0.17			1.95	
Er		4.05		0.47				-1.77	1.29				1.20			1.16	
Eu		1.59		0.99	0.07			-1.11	1.06				-0.65			0.91	
Ga	-0.59			1.11				0.23					-0.40	0.35	0.07	0.45	0.45
Gd				0.44				-1.56	0.41				0.22			1.08	
Hf				1.26	1.66			2.62	-1.53				-0.09		-1.44	0.82	
Ho			0.13	1.42					0.26				-0.48			1.29	
La		6.89		-1.01	-1.27			-2.46	0.97				1.30	-3.47	-3.83	-0.15	
Li		-0.91		0.49		-0.93			0.97		-3.74		-2.34				
Lu			1.46	3.14					-0.44				0.29			0.91	
Mo				0.00	0.00					-0.40	-6.37						
Nb	0.12		-1.54	0.06				-0.83		-2.61			-1.72	1.76	0.06	-0.12	0.12
Nd		1.37		0.11	1.37			-2.11	0.87				-0.71	-9.77	-3.84	-1.53	
Ni	0.55	-2.17		0.14	0.16	0.27		0.27		2.60	0.55		-1.47	-0.82	-0.46	-0.62	1.71
Pb	2.51			0.10				-0.07		-2.71	-12.02		-1.12	2.67	-0.53	-0.73	1.19
Pr		2.44		-0.32				-1.93	2.28				-1.06			-1.21	
Rb	0.31			-0.21	-0.42			0.56	-0.91		-0.42		0.36	0.19	-0.19	-0.50	-3.36
Sc	0.09	1.43			-0.58			-0.95		-0.62	0.09			-0.31	-0.35	2.49	-1.24
Sm		1.74		0.14	-0.34			-1.09	0.91				-0.60		-4.04	0.91	
Sr	-0.29	0.13		-0.54	0.29			-0.48	0.13		-1.13		-0.44	0.11	0.08	-0.62	-0.37
Ta					0.00					2.18						0.54	
Tb			1.93	2.41	-1.54				0.77				-0.10			1.16	
Th				-0.59	1.39			-1.95		4.94			0.05	-0.80	-1.31	1.39	-0.37
Tm			1.74	2.61					1.39				0.87			1.04	
U					0.27					-0.41				5.88		-0.14	6.84
V	0.65	0.39		0.13		0.20		0.71		0.45	-0.38		-0.06	-0.64	-0.33	1.16	-0.64
Y	2.15	1.07		-0.54				-3.54		4.29	-10.73		-0.54	0.56	-1.23	2.15	-5.37
Yb			0.58	1.09	1.15			-2.20	0.12				-0.35			0.33	
Zn	-0.08	-0.08		-0.79	0.52	5.69		-0.49	2.03	8.85	0.22		0.26	-0.64	0.10	-1.59	0.22
Zr	1.74	-0.58		-0.14	2.23			0.14		0.69	-26.91		0.20	0.58	-0.14	0.89	-0.83

Table 3 GeoPT7 z-scores

Table 3																	
Round k	H57	H58	H59	H60	H61	H62	H63	H63	H64	H64	H65	H66	H66	H67	H68	H69	H70
Techniqu	X	I	AA,M	X	A	A,ISE,	A,IR,	A,IR,	M	M	A,ISE,	M	M	M	G, X	AA, A,	AA, A
code						M,X	M,T,X	M,T,X			X					M,W	
Data qua	2	2	1	1	1	2	1	2	1	2	2	1	2	1	1	1	1
SiO_2	-0.03				-0.73	0.18	-0.53				-2.64				-0.18	-0.82	0.84
TiO_2	0.20			2.45	-0.96	-0.41	-0.28				-0.35		-0.82		0.47	1.08	1.08
Al_2O_3	0.02		14.78		-1.72	-0.33	-0.19				-0.14				-0.05	1.00	-0.29
Fe_2O_3T	-0.48	-0.64		-15.74	0.02	-0.75	0.45				0.25				1.00	4.80	0.56
Fe(II)O						0.04		-0.04								-1.70	
MnO	1.91		-4.79	4.79	0.00	0.00	-4.79				-0.48		-0.96		-0.96	-4.79	0.00
MgO	-1.11		-33.75		-0.67	1.11	0.00				-0.34				0.67	0.00	0.22
CaO	0.10			-2.29	-1.25	1.98	2.09				0.83				0.83	2.92	1.25
Na_2O	-1.68	-1.60			-2.19	0.42	0.34				-0.06				-0.67	-1.85	0.67
K_2O	0.77			-5.37	0.26	-0.13	3.84				0.35				-0.51	0.51	1.54
P_2O_5	-2.12				0.04	-2.12	-4.24				-0.83				-6.80	8.60	8.60
LOI	3.48					-3.22	-2.61								14.60	7.59	-0.06
Ba	1.48	1.61	-12.27		-0.88	0.44		0.21	0.08		0.42	0.31		-2.49	-2.00	0.50	0.38
Be			-1.09			8.20											
Ce					1.28	1.51	0.00		0.67		2.07	1.40		0.43	-3.71	0.92	
Co	0.77	-0.53	-0.26		-2.47	-1.24		-0.37			-0.22	1.65		-2.07	4.56	0.14	5.56
Cr	-2.37	-0.22	-1.21	-0.21	-0.36	1.10		0.04			2.12	1.60			-2.93	0.69	-2.17
Cs		-0.16	-0.66			-0.33	0.00		-0.30			0.66				3.29	
Cu	0.00		0.00	5.77	0.00	1.74		-0.76			0.60	0.28			3.48	0.56	
Dy					0.17	0.08	1.31		-0.98			0.21		-1.30		0.49	
Er					0.60	0.65	0.33		-1.12			-0.22		0.05		-0.98	
Eu		0.34			0.22	-0.19	-0.08		-0.31			-0.54		-0.16		1.44	
Ga			0.24	-2.16		-0.82		0.07				1.60		-0.70	-0.59	1.50	
Gd					-1.79	1.77	0.01		-0.59			0.28		0.61		-1.12	
Hf		0.64				2.21				-5.09		-5.29		-0.96		0.18	
Ho		0.13			1.29	0.56	-0.09		-1.28			-0.78		-0.78		-1.12	
La		0.14			0.92	0.50	0.45		-0.02			0.32			-8.13	0.62	
Li			0.69		4.74	-0.46		0.63					0.06			0.97	
Lu		0.67			0.23	0.45	0.23		-1.01			-0.77		-1.44		-0.10	
Mo						0.00						-0.16				0.08	
Nb						0.06	1.48					0.48		-1.99		-1.64	
Nd		0.51			0.87	0.33	0.11		0.05			0.05		0.00		1.68	
Ni	3.38	3.18	-0.27	-4.97	-0.62	1.24		-0.65			-0.22	0.82			0.16	0.39	-2.17
Pb	1.25		1.85	7.00		0.59		-0.16	-0.26			-1.98			1.19	0.00	
Pr					-0.87	-0.20	1.28		0.55			0.71		0.71		1.50	
Rb		-0.66	-15.96	-0.79		0.36	1.69		-0.46			0.60			6.02	1.66	
Sc		0.14			-1.24	-8.16		0.05				0.49			0.09		
Sm		0.00			0.76	1.12	-0.17		-0.10			1.13		-0.12		0.93	
Sr	2.49		-10.13	2.10	-0.54	-0.06	2.21		0.13		0.09	1.97		0.21	0.21	-1.04	-0.12
Ta		0.00				-1.77						-0.54				0.27	
Tb		0.10				0.96	0.00		-1.18			0.19		-1.16		-0.58	
Th	-0.99	1.88				0.13	1.45		0.59			1.39		0.75	-0.37	2.51	
Tm						0.00			-1.46			-0.35				0.00	
U		0.62	-3.14			-0.14	-0.55		-1.26			0.14				0.27	
V	15.92		-0.38		-1.93	1.35		-1.11			0.03	1.42			-2.45	-0.31	1.42
Y				-1.50	-1.07	0.54	1.36		-1.50			-0.43			0.00	-0.32	2.15
Yb		0.58			-0.90	0.58	-0.36		-0.90			-0.08		0.12		1.70	
Zn	-0.04		1.01	1.10	-0.98	-0.79		0.77			14.80	-2.07			0.22	0.58	1.13
Zr	8.46	-1.94			-7.44	0.63				-8.40	-12.73	-8.66			4.07	0.64	2.85

Table 3 GeoPT7 z-scores

Table 3							
Round ic	H71	H71	H72	H73	H74	H75	H76
Techniqu	I	1	X	X	AA,M	A	A,T,
code					ISE		X
Data qua	1	2	1	1	2	2	2
SiO_2			-0.63	0.44	0.00	0.04	0.15
TiO_2			6.54	1.76	0.06	-0.82	-0.17
Al_2O_3			0.52	-1.14	0.19	-0.72	-0.36
Fe_2O_3T		-0.53	9.15		0.79	1.58	-0.72
Fe(II)O				17.53			-1.29
MnO			0.00	-1.44	-1.44	0.00	-0.72
MgO			6.44	3.55	-0.91	-0.89	-0.48
CaO		2.61	4.59	2.92	0.99	1.77	0.45
Na_2O		-1.52	-3.03	2.69	0.38	-4.21	-0.07
K_2O		-0.51	1.54	5.12	0.68	1.92	1.22
P_2O_5			12.88	15.02	0.88	-14.95	-1.69
LOI				3.12	-0.51	10.81	-5.71
Ba		0.88	2.99		-0.92	1.44	0.71
Be						2.73	
Ce	-0.64		-9.30			4.72	-0.21
Co		-0.28		27.66	1.28	2.68	-1.74
Cr		-0.63	-4.74	-1.72	-0.86	2.08	0.50
Cs							
Cu			3.48		3.13	2.36	-2.09
Dy							
Er							
Eu	-1.13					-1.11	
Ga			7.77		2.32		4.41
Gd							12.95
Hf		0.39					-4.14
Ho	2.67						
La	-0.05		-9.42			-0.05	-1.38
Li					-0.46	-3.05	-3.05
Lu	-0.10						
Mo						60.14	
Nb			-1.65			12.87	
Nd	-1.11						-5.04
Ni			5.59	71.96	-0.31	0.20	-5.16
Pb			1.19			32.22	-6.67
Pr							
Rb		1.75	8.06				
Sc		-0.09					-2.62
Sm	-0.59					1.61	
Sr			-0.71			-1.27	3.20
Ta						16.34	
Tb	1.74						
Th		0.29	-0.37		7.82		
Tm							
U			28.71		677.5		
V			-0.38	-14.56			-3.09
Y			-6.44	18.24	-2.68	-3.86	-0.27
Yb	0.26						
Zn			2.33		0.56	2.46	-5.62
Zr			0.15	-13.93		-13.80	2.16

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Figure captions

Figure 1

GBPG-1 Garnet-biotite plagiogneiss: 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

GBPG-1 Garnet-biotite plagiogneiss: Data distribution charts for elements for which values were not 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 3

GBPG-1 Garnet-biotite plagiogneiss: Multiple z-score charts for laboratories participating in the GeoPT7 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 (▲).

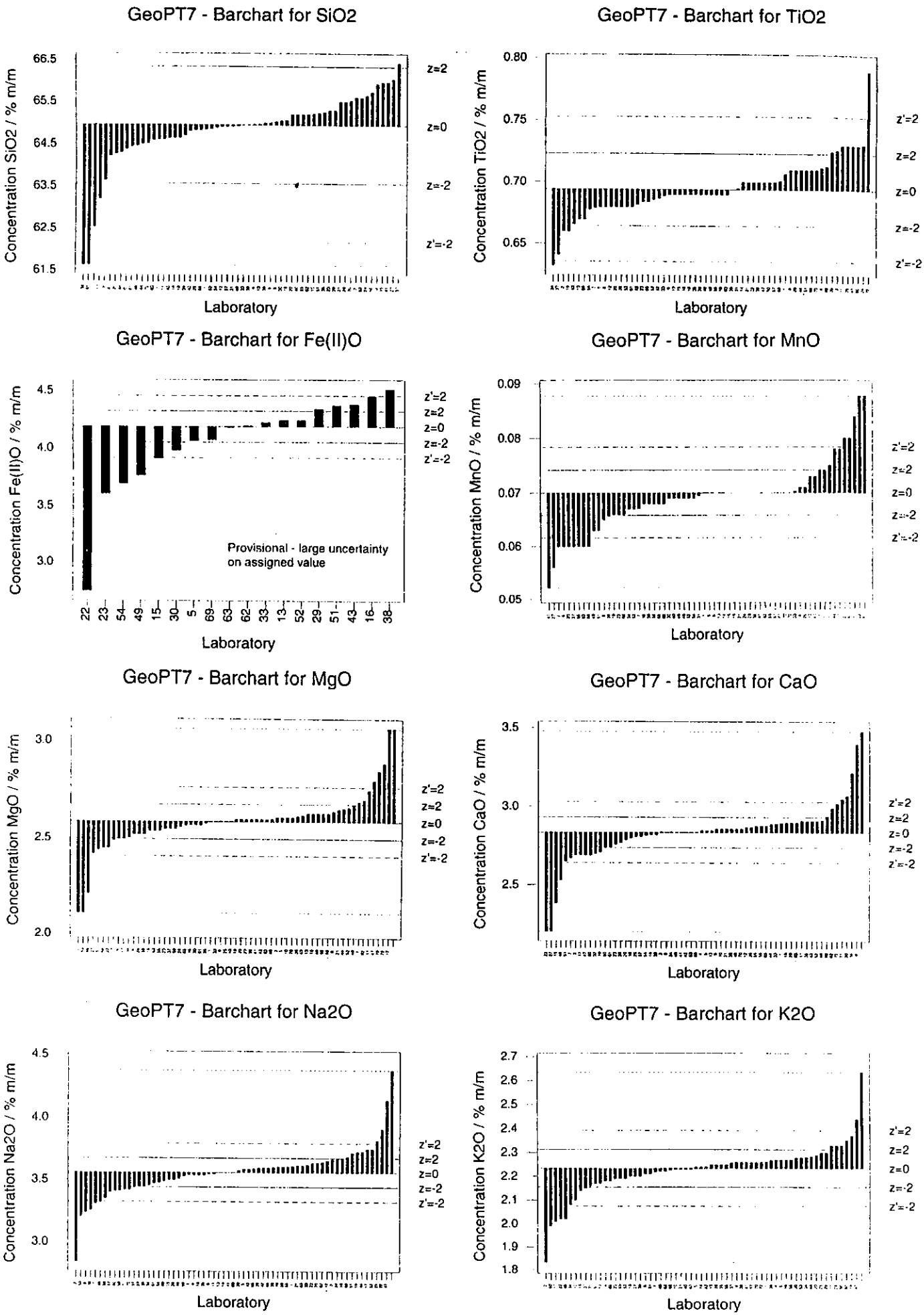
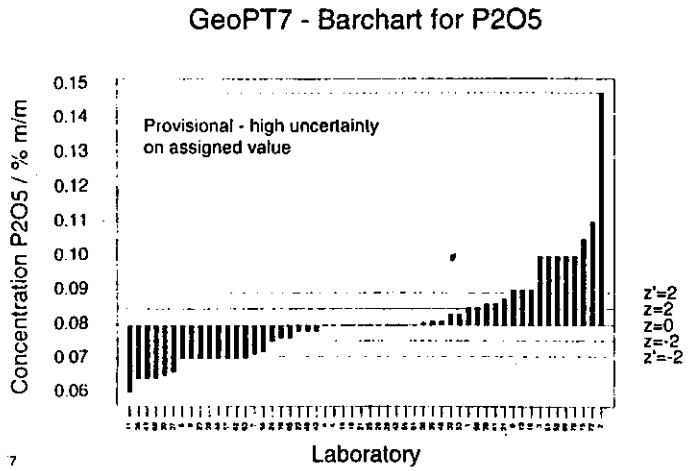
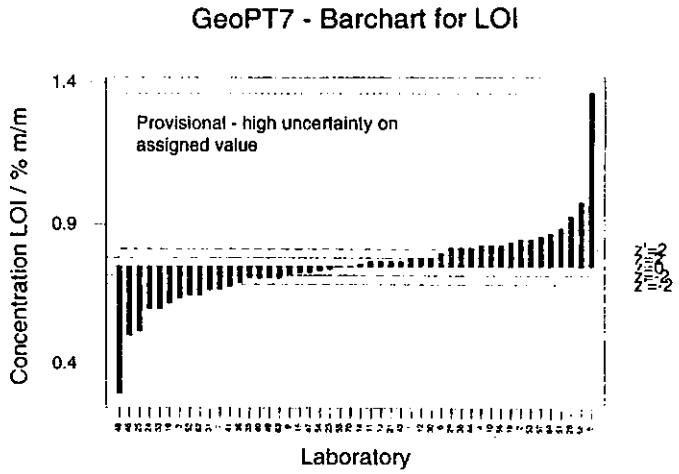
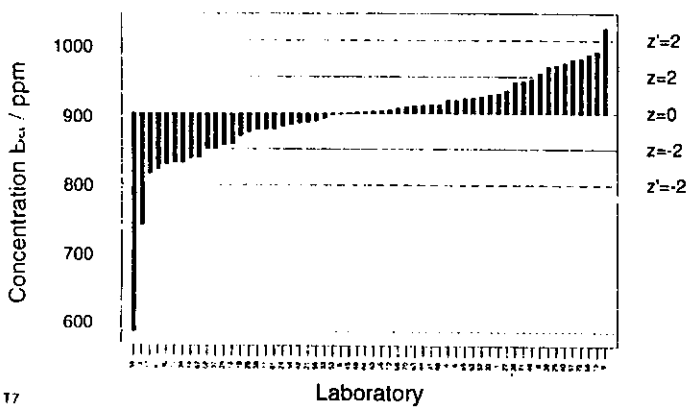
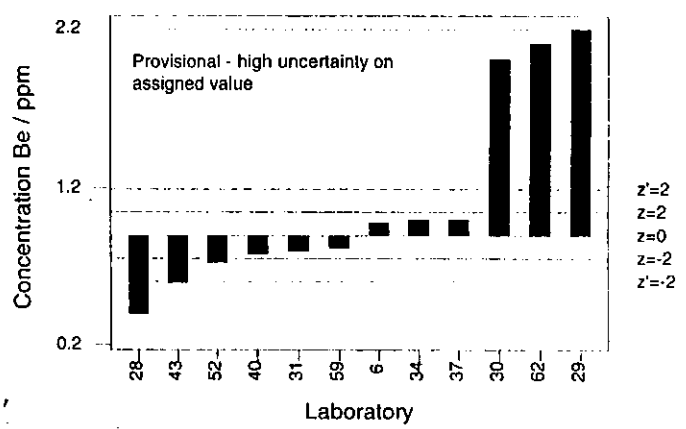

GeoPT7 - Barchart for SiO2
Concentration SiO2 / % m/m
66.5
65.5
64.5
63.5
62.5
61.5
z=2
z=0
z=-2
z'=-2
Laboratory
GeoPT7 - Barchart for TiO2
Concentration TiO2 / % m/m
0.80
0.75
0.70
0.65
z'=2
z=2
z=0
z=-2
z'=-2
Laboratory
GeoPT7 - Barchart for Fe(II)O
Concentration Fe(II)O / % m/m
4.5
4.0
3.5
3.0
z'=2
z=2
z=0
z=-2
z'=-2
Provisional - large uncertainty on assigned value
22 23 54 49 15 30 5 69 63 62 33 13 52 29 51 43 16 38
Laboratory
GeoPT7 - Barchart for MnO
Concentration MnO / % m/m
0.09
0.08
0.07
0.06
0.05
z'=2
z=2
z=0
z=-2
z'=-2
Laboratory
GeoPT7 - Barchart for MgO
Concentration MgO / % m/m
3.0
2.5
2.0
z'=2
z=2
z=0
z=-2
z'=-2
Laboratory
GeoPT7 - Barchart for CaO
Concentration CaO / % m/m
3.5
3.0
2.5
z'=2
z=2
z=0
z=-2
z'=-2
Laboratory
GeoPT7 - Barchart for Na2O
Concentration Na2O / % m/m
4.5
4.0
3.5
3.0
z'=2
z=2
z=0
z=-2
z'=-2
Laboratory
GeoPT7 - Barchart for K2O
Concentration K2O / % m/m
2.7
2.6
2.5
2.4
2.3
2.2
2.1
2.0
1.9
1.8
z'=2
z=2
z=0
z=-2
z'=-2
Laboratory

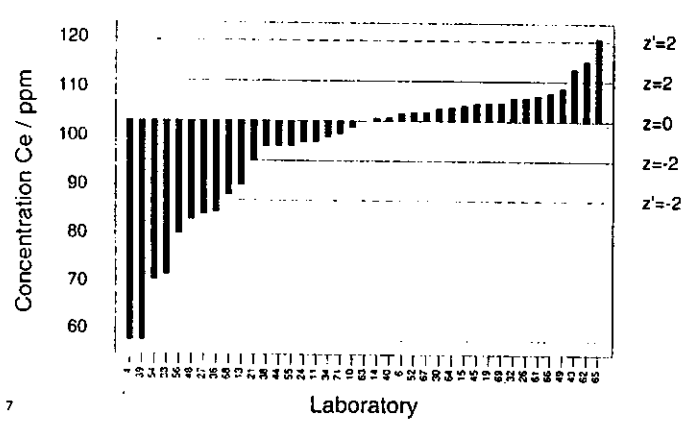
Figure 1

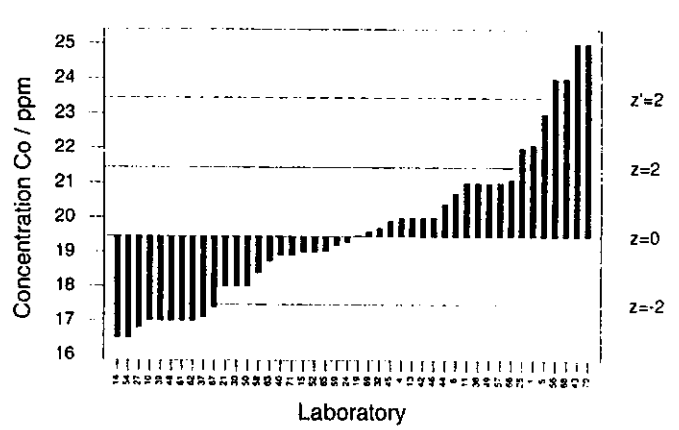


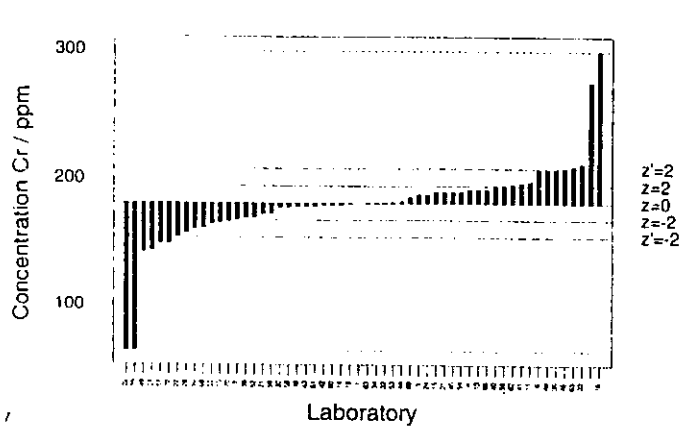


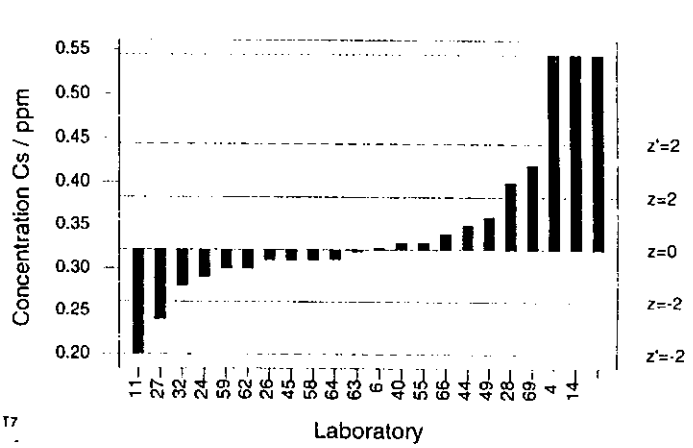












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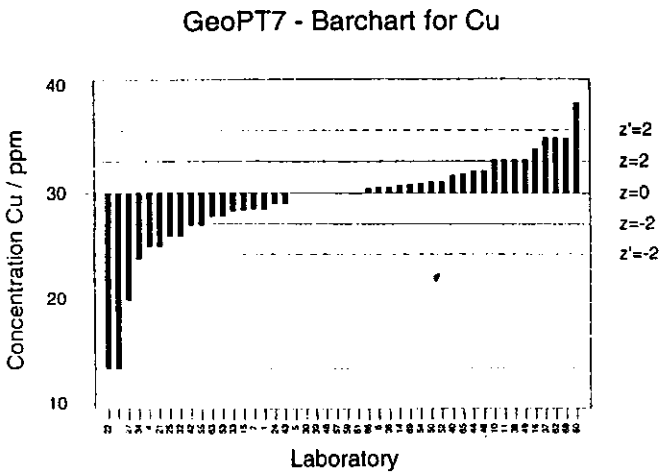

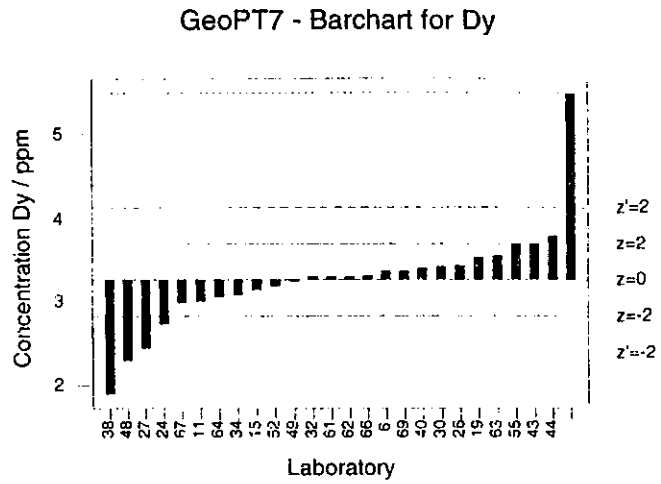

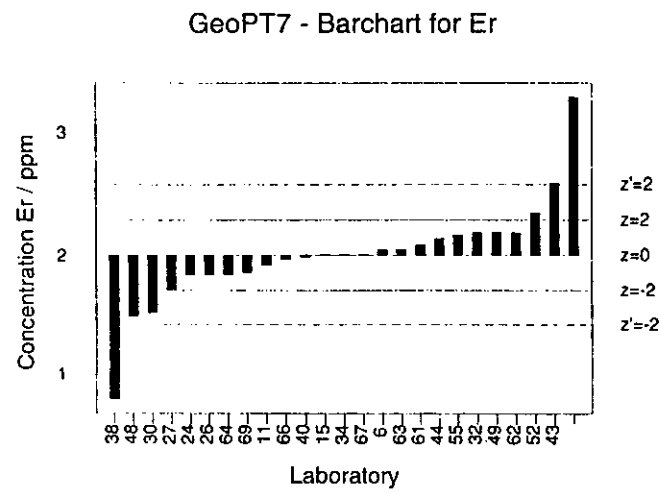

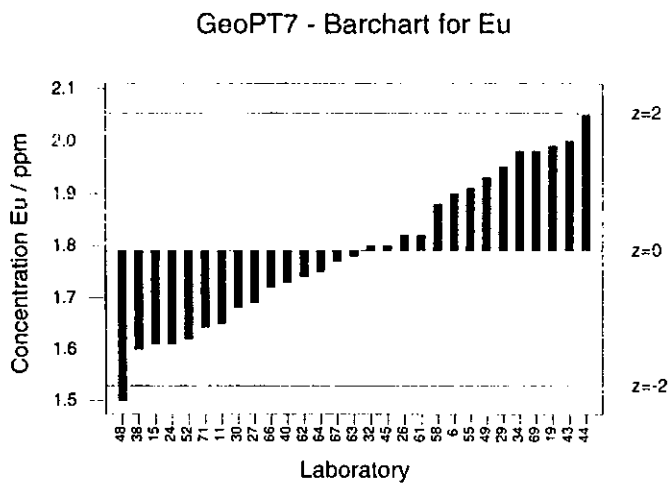

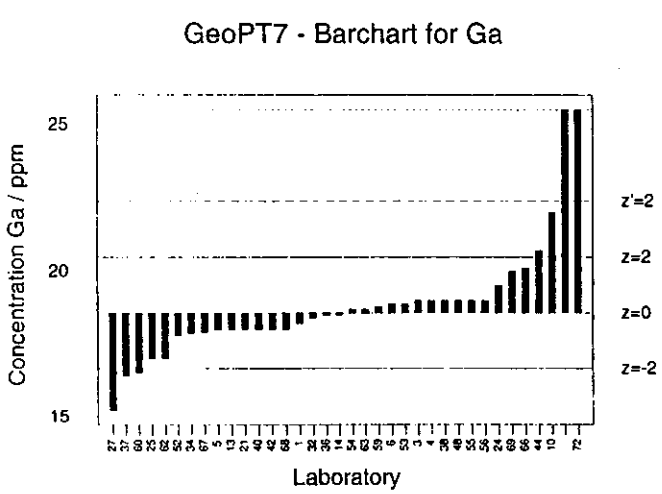

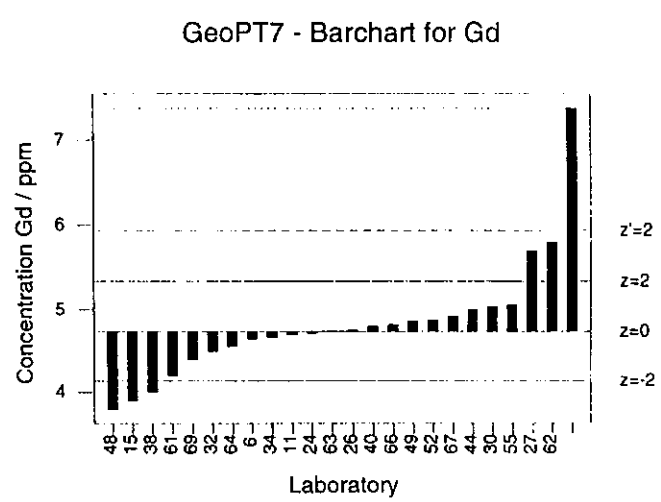

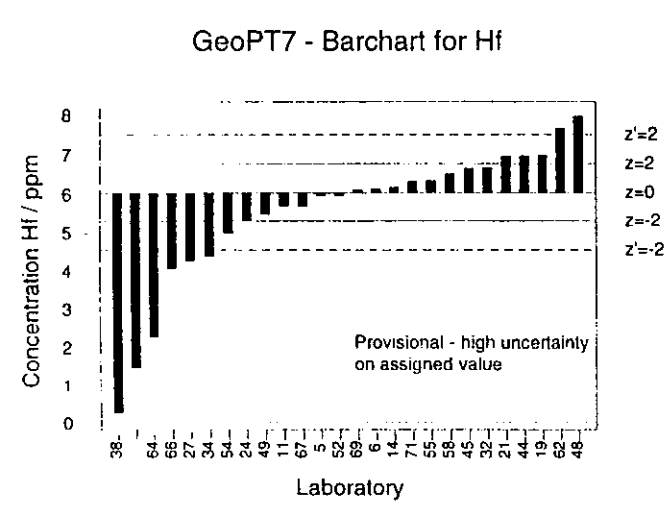

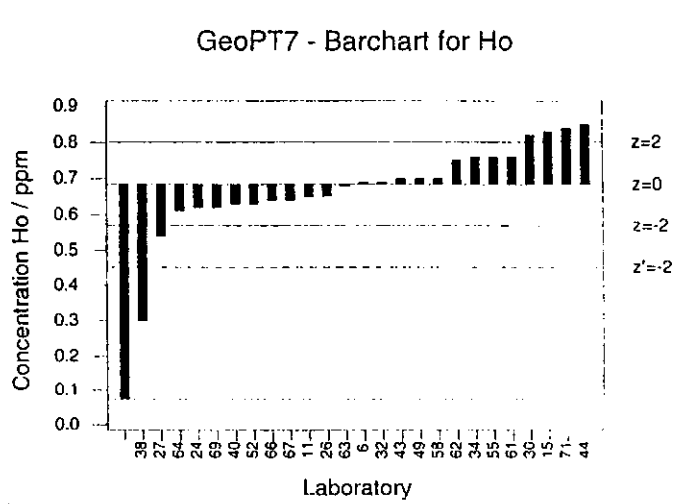

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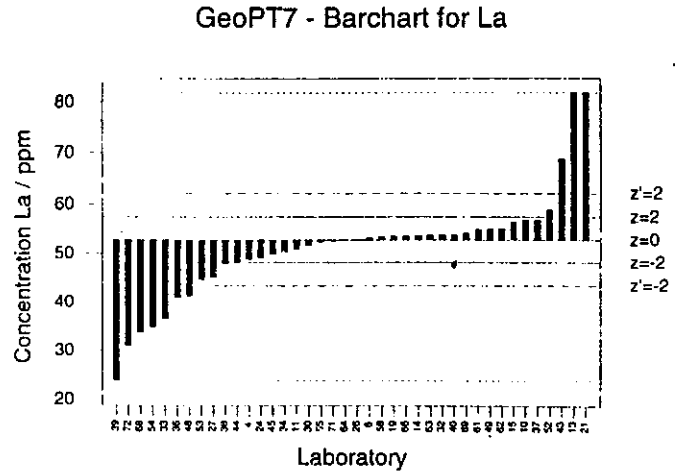

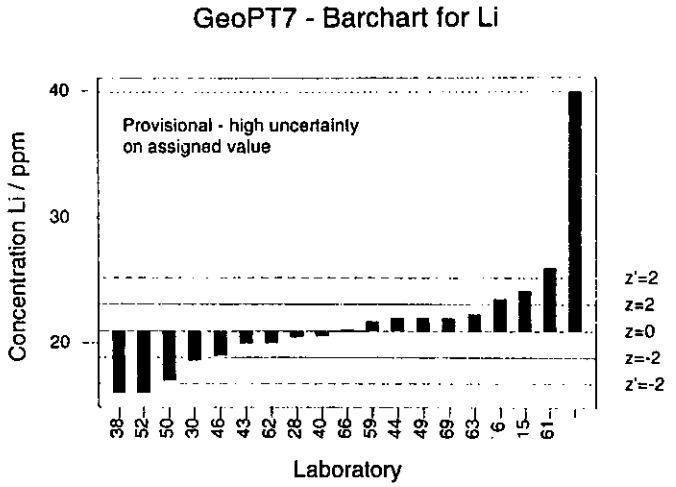

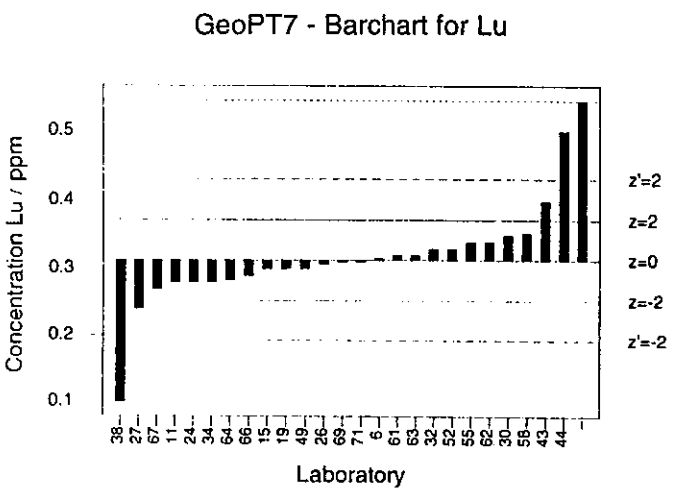

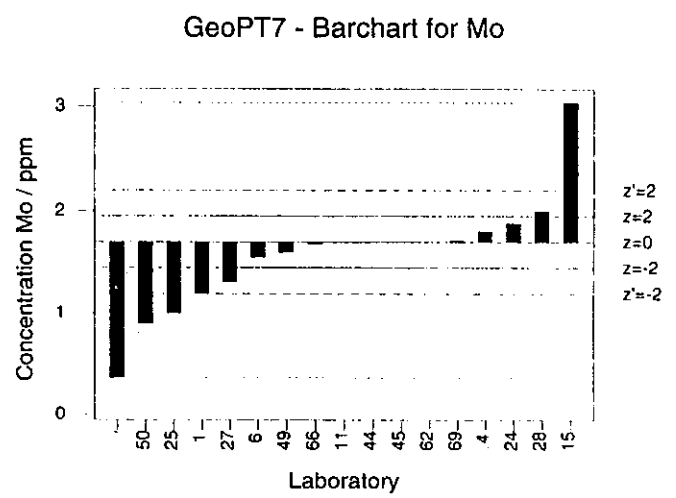

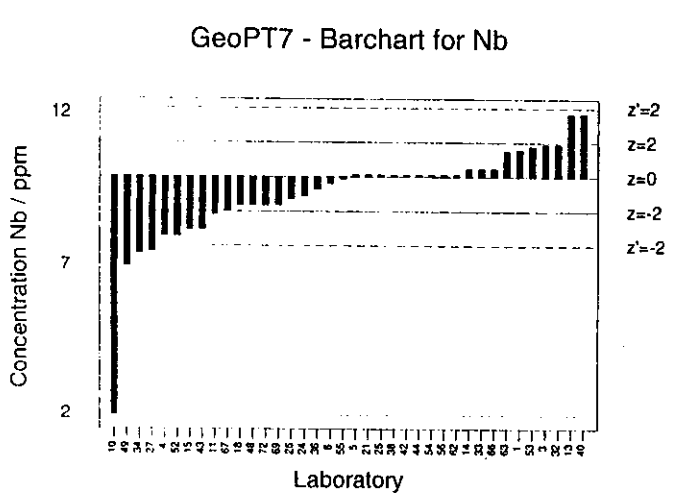

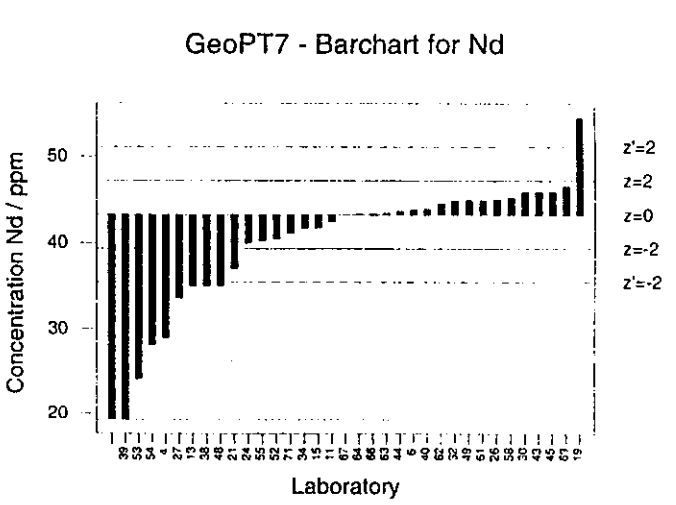

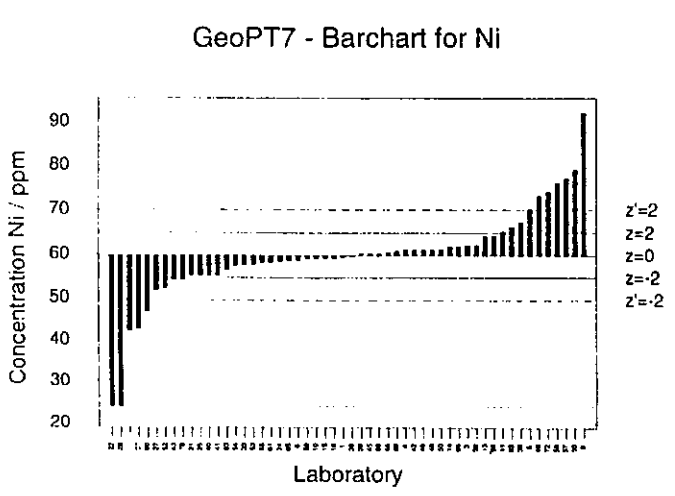

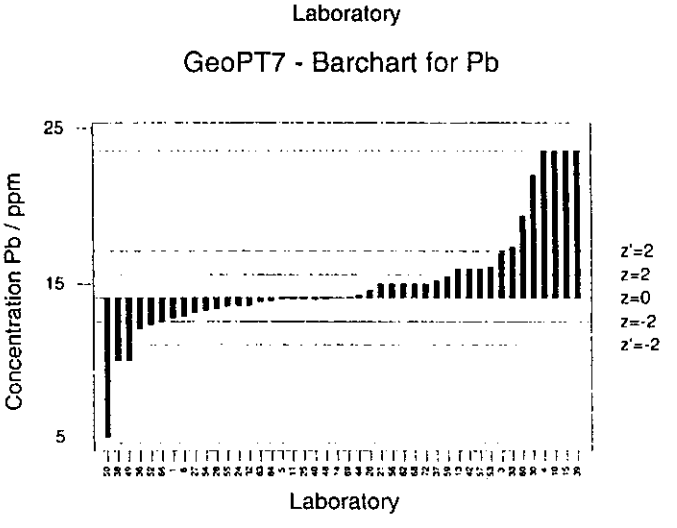

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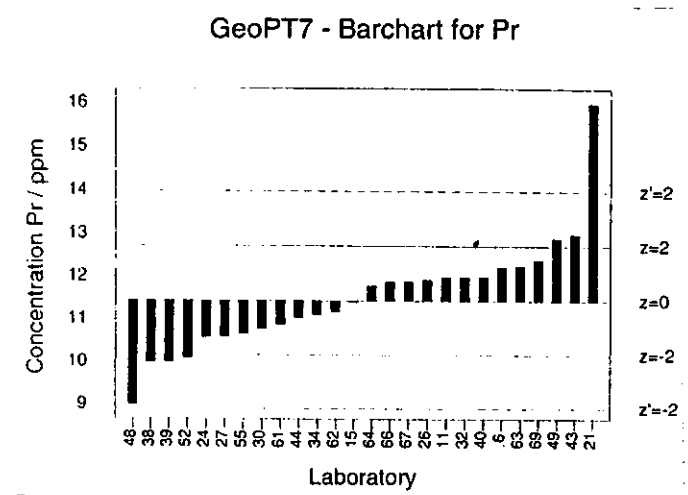

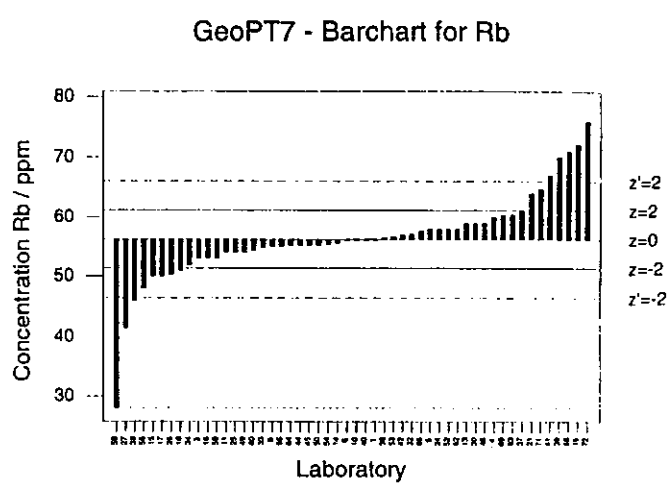

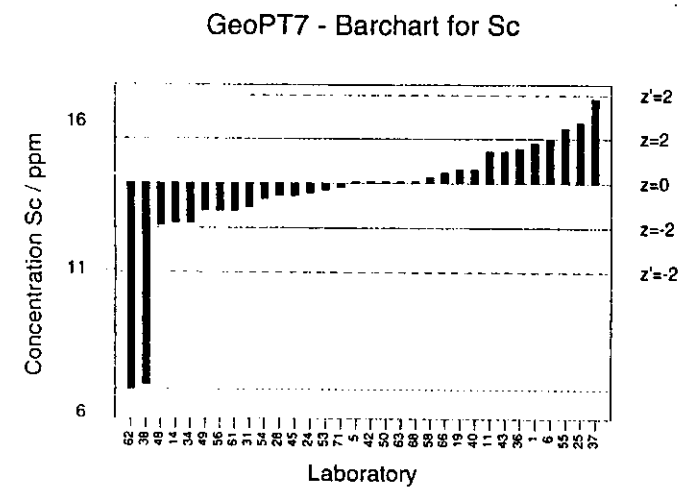

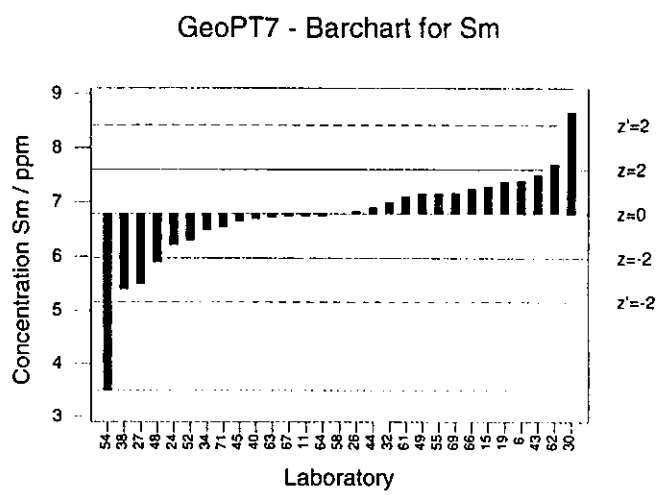

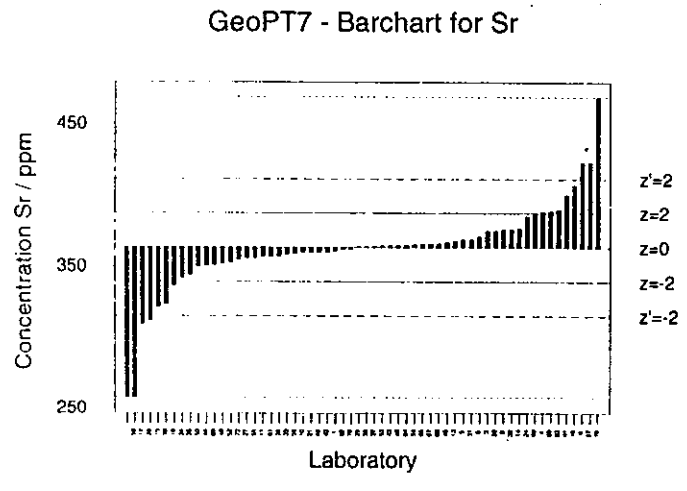

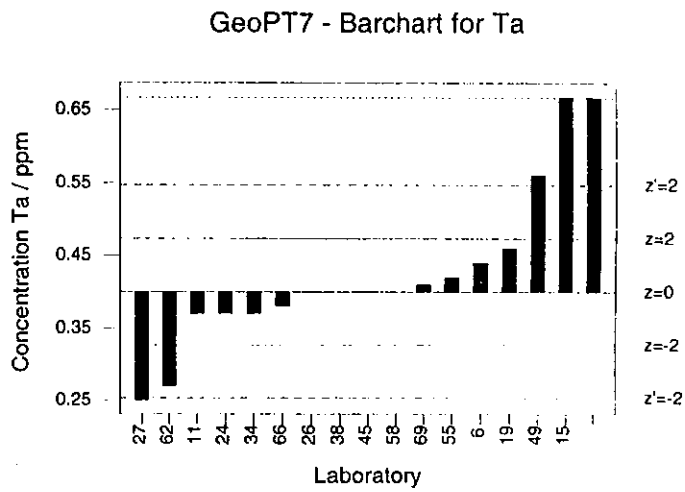

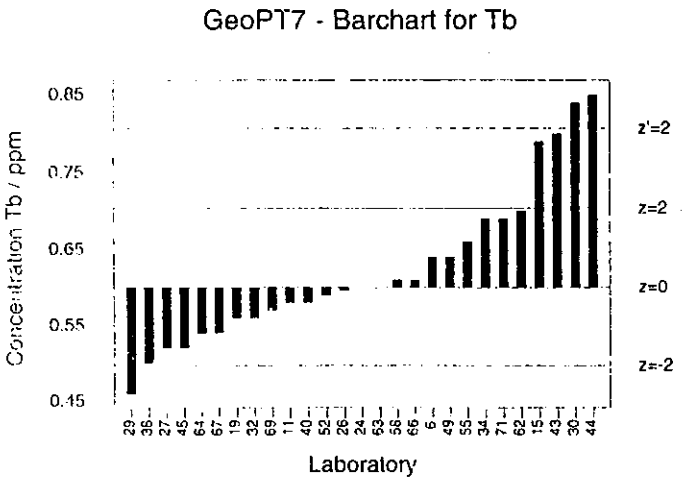

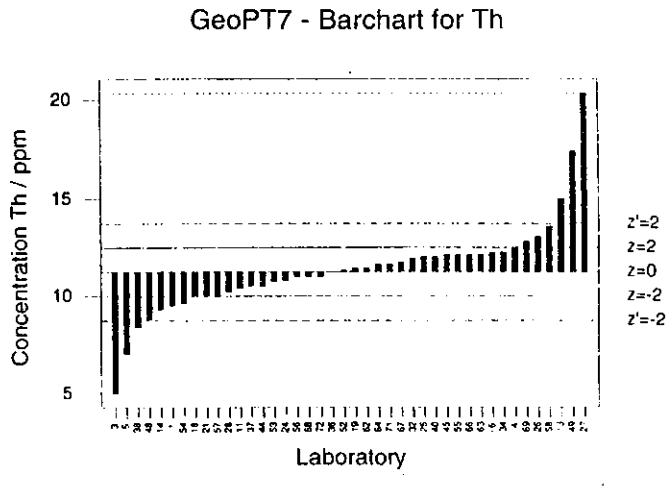

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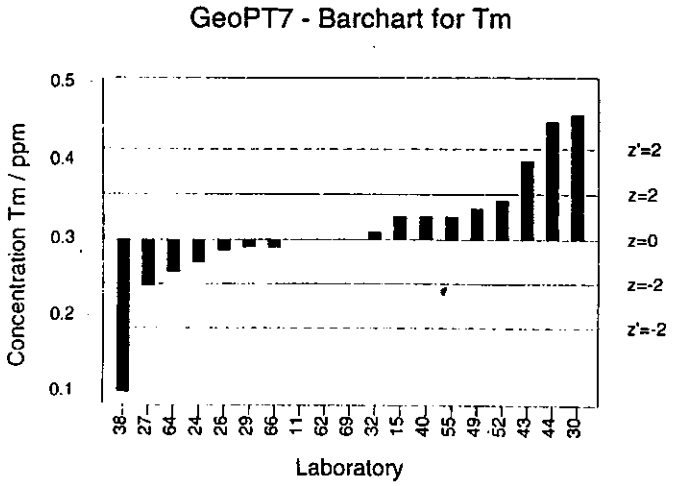

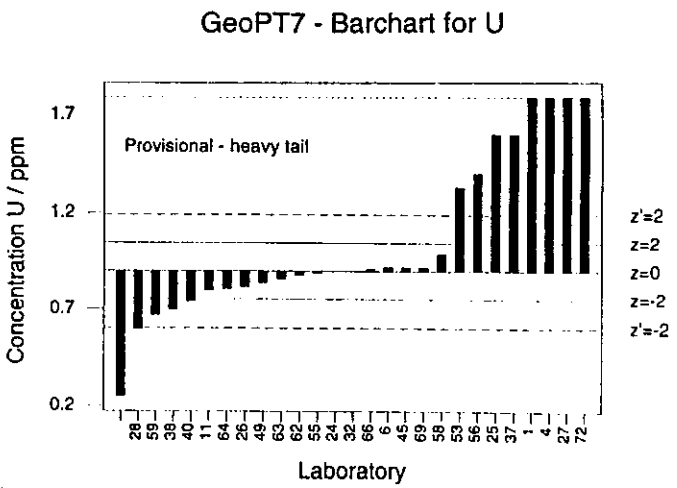

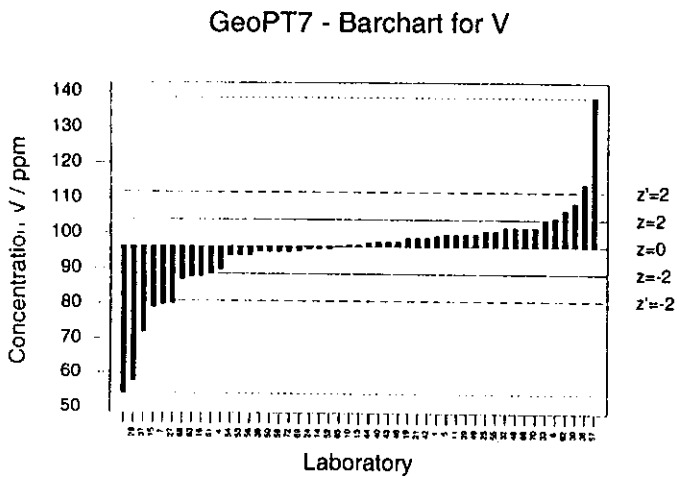

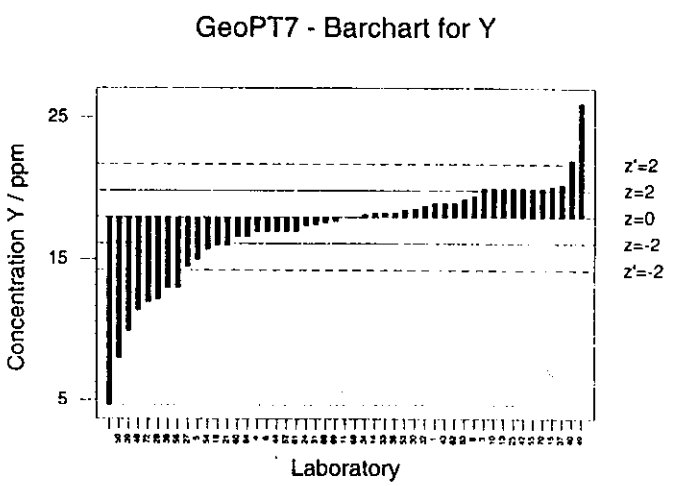

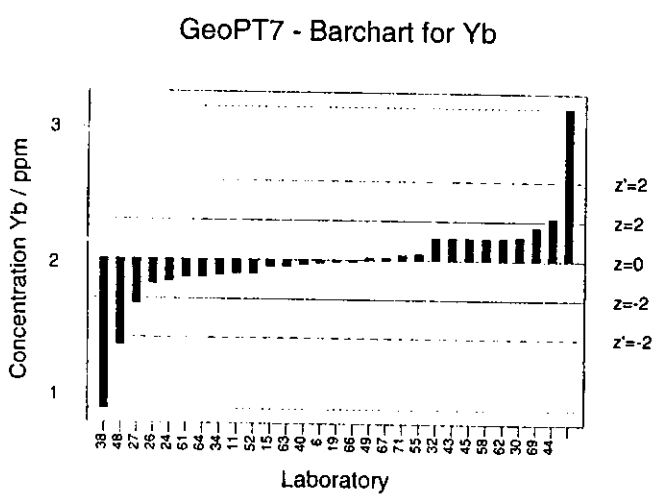

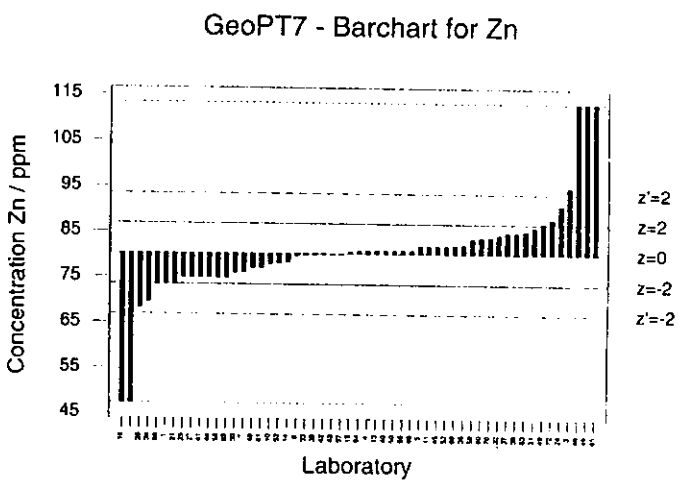

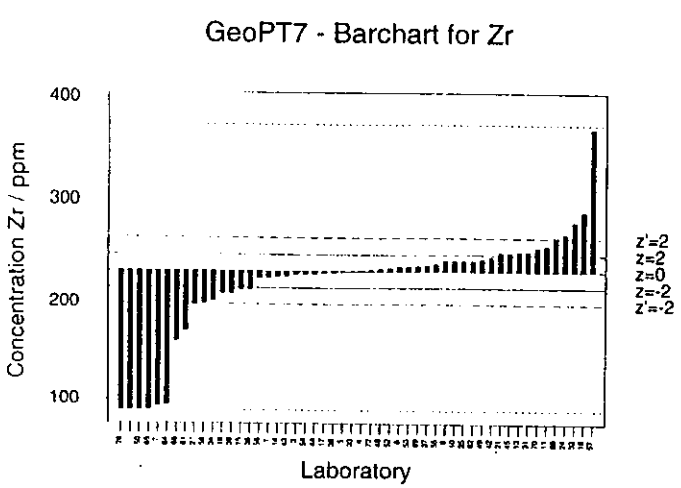

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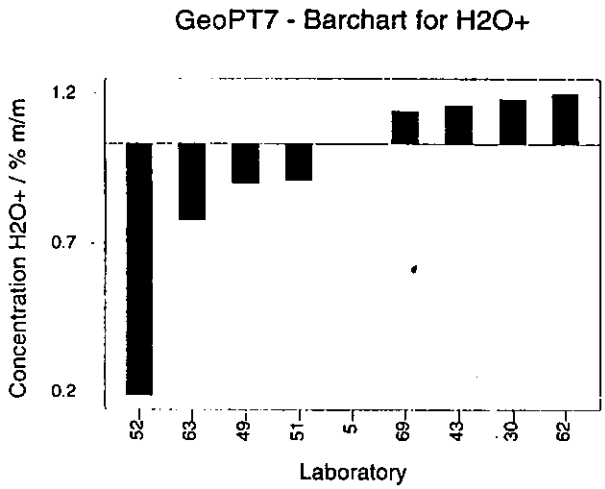
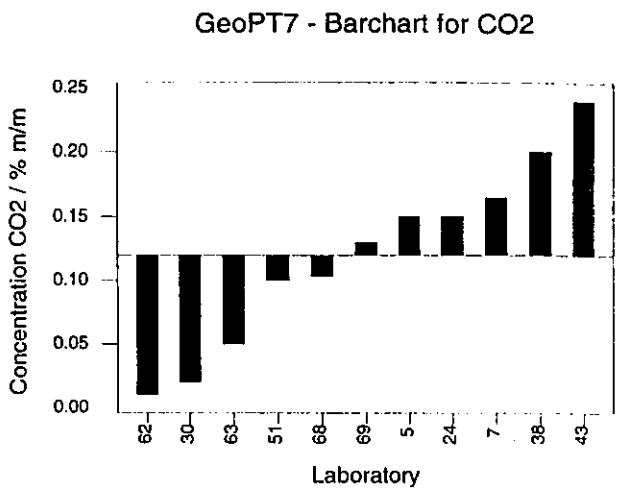
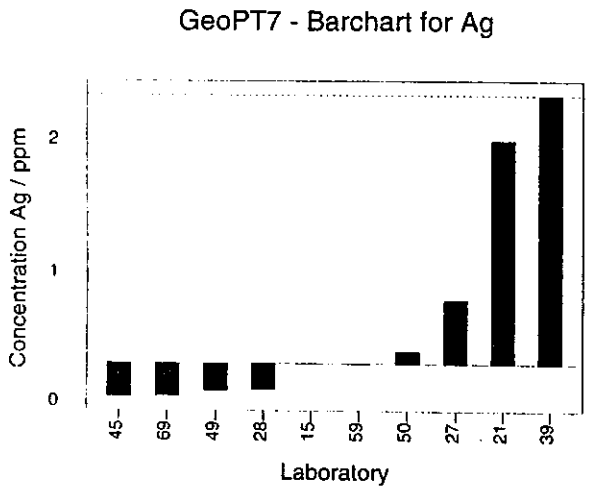
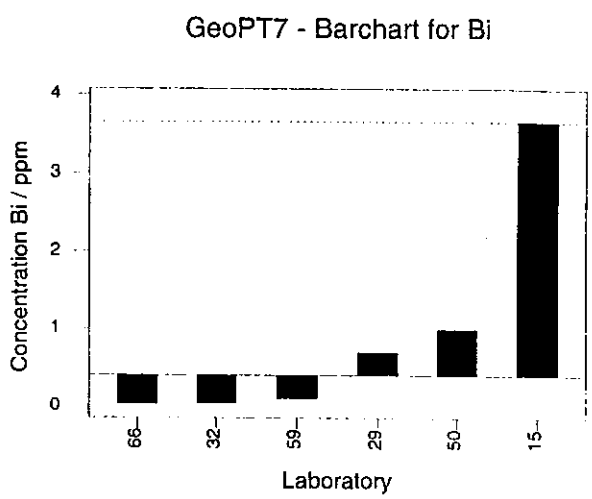
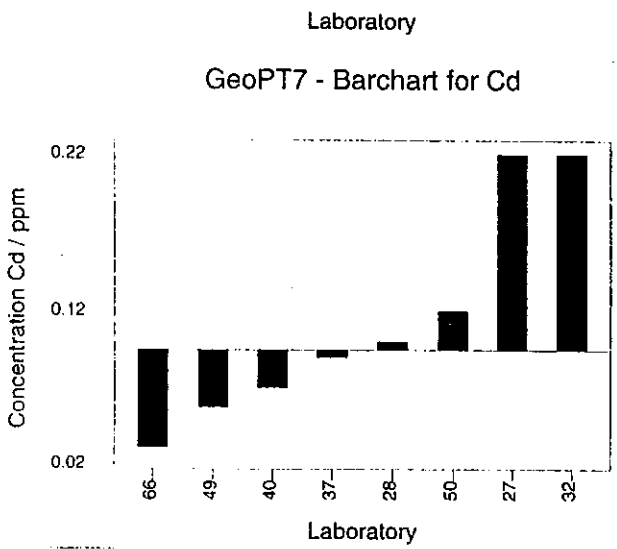
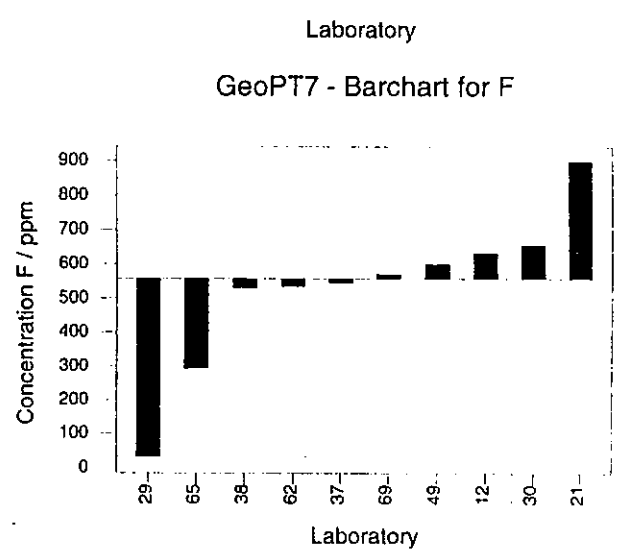

GeoPT7 - Barchart for H2O+
Concentration H2O+ / % m/m
1.2
0.7
0.2
52
63
49
51
5
69
43
30
62
Laboratory

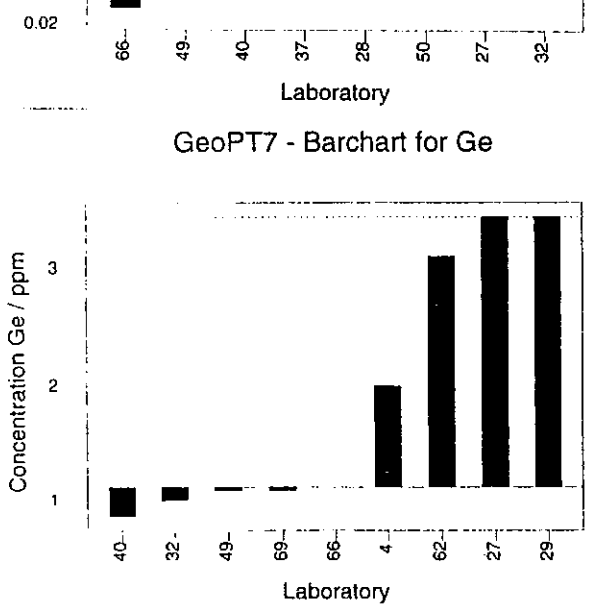

GeoPT7 - Barchart for CO2
Concentration CO2 / % m/m
0.25
0.20
0.15
0.10
0.05
0.00
62
30
63
51
68
69
5
24
7
38
43
Laboratory


GeoPT7 - Barchart for Ag
Concentration Ag / ppm
2
1
0
45
69
49
28
15
59
50
27
21
39
Laboratory


GeoPT7 - Barchart for Bi
Concentration Bi / ppm
4
3
2
1
0
66
32
59
29
50
15
Laboratory


GeoPT7 - Barchart for Cd
Concentration Cd / ppm
0.22
0.12
0.02
66
49
40
37
28
50
27
32
Laboratory


GeoPT7 - Barchart for F
Concentration F / ppm
900
800
700
600
500
400
300
200
100
0
29
65
38
62
37
69
49
12
30
21
Laboratory


GeoPT7 - Barchart for Ge
Concentration Ge / ppm
3
2
1
40
32
49
69
66
4
62
27
29
Laboratory

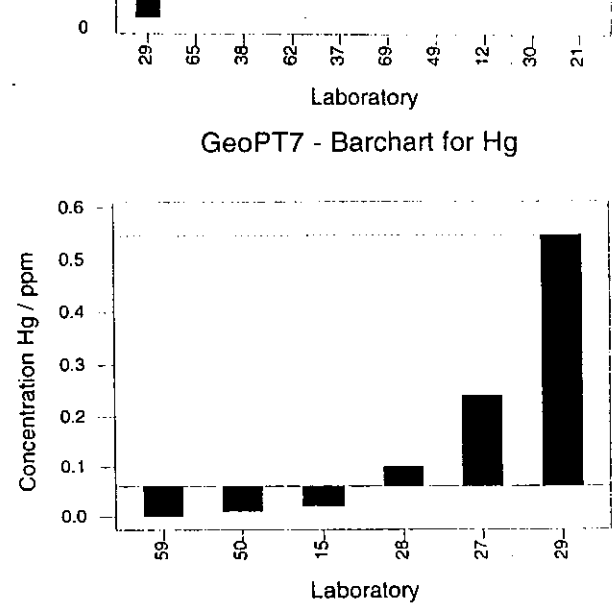
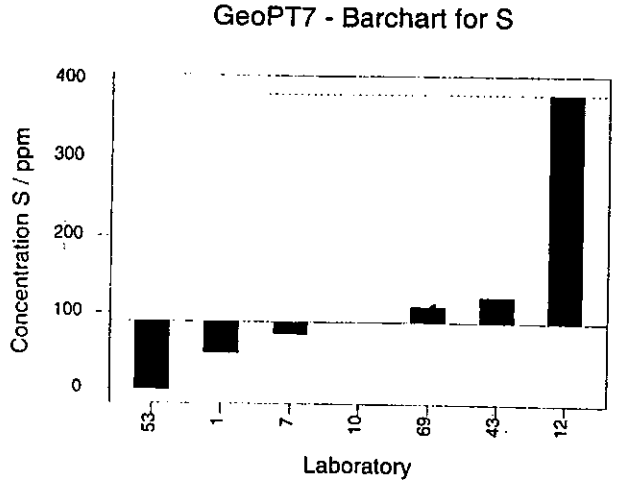
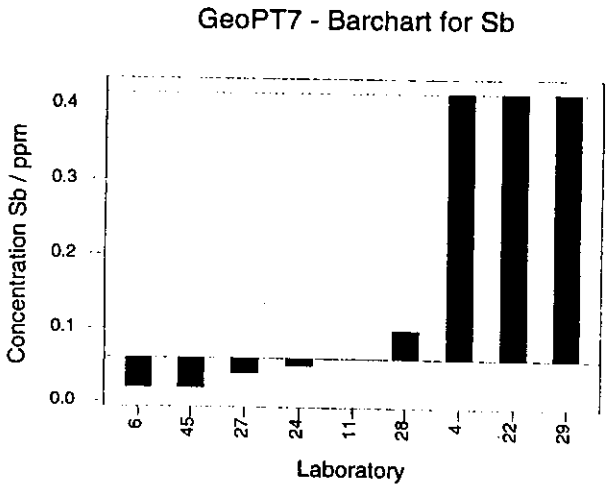
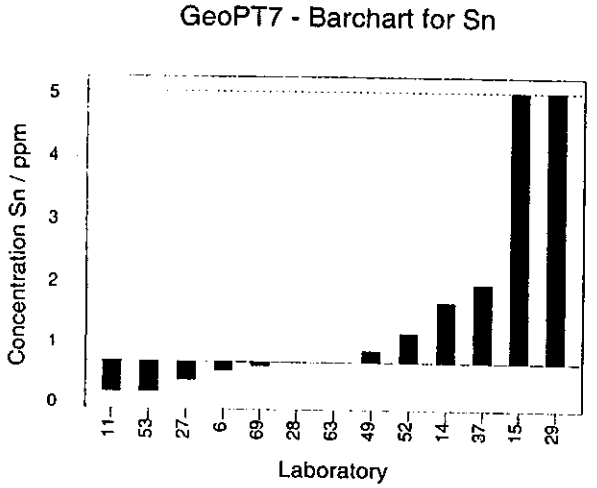
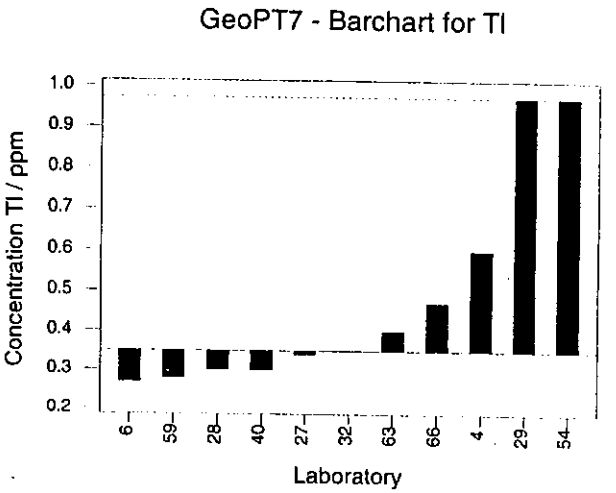

GeoPT7 - Barchart for Hg
Concentration Hg / ppm
0.6
0.5
0.4
0.3
0.2
0.1
0.0
59
50
15
28
27
29
Laboratory

Figure 2









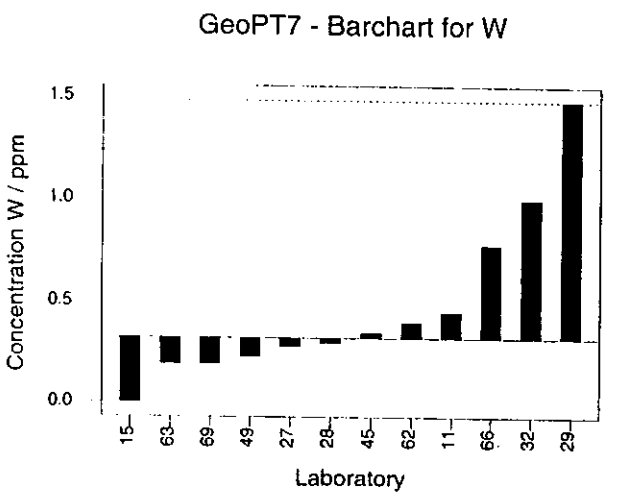


Figure 2 (continued)

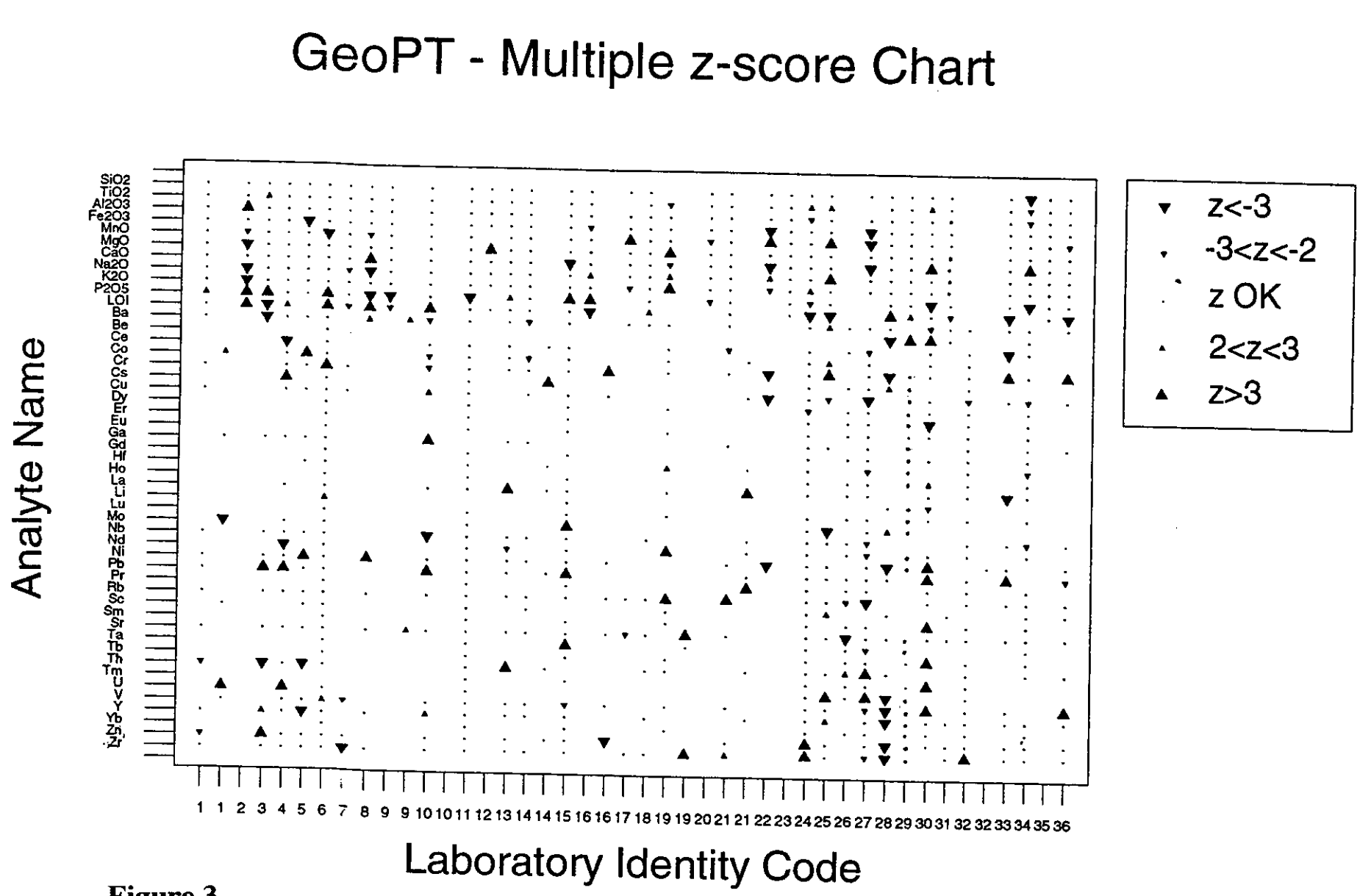

GeoPT - Multiple z-score Chart
Analyte Name
SiO2
TiO2
Al2O3
Fe2O3
MnO
MgO
CaO
Na2O
K2O
P2O5
LOI
Ba
Be
Ce
Co
Cr
Cs
Cu
Dy
Er
Eu
Ga
Gd
Hf
Ho
La
Li
Lu
Mo
Nb
Nd
Ni
Pb
Pr
Rb
Sc
Sm
Sr
Ta
Tb
Th
Tm
U
V
Y
Yb
Zn
Zr
1 1 2 3 4 5 6 7 8 9 9 10 10 11 12 13 14 14 15 16 16 17 18 19 19 20 21 21 22 23 24 25 26 27 28 29 30 31 32 32 33 34 35 36
Laboratory Identity Code
z<-3
-3<z<-2
z OK
2<z<3
z>3

Figure 3

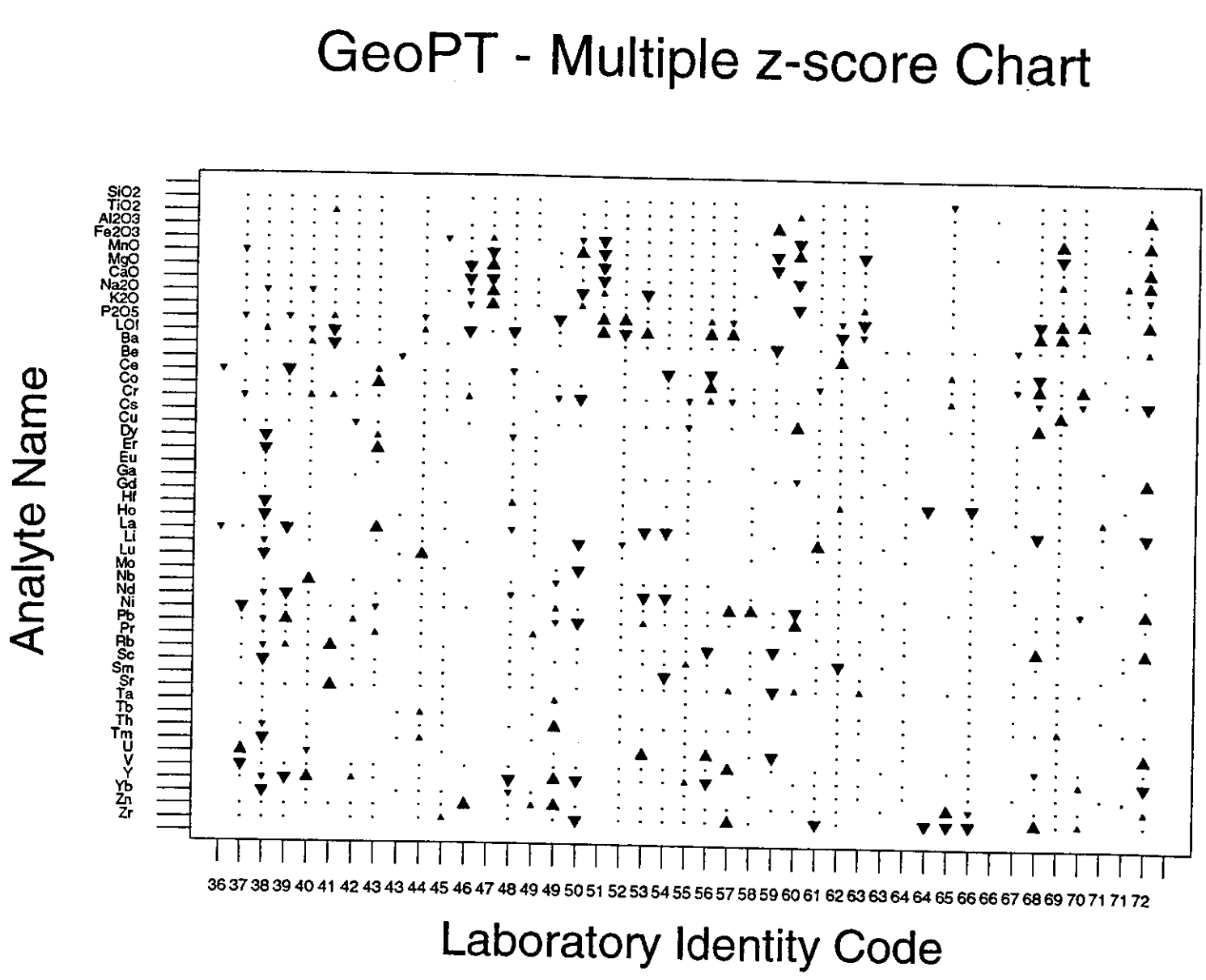


Figure 3 (continued)