

TOY SAFETY PROFICIENCY TESTING PROGRAMME

(APLAC – T039)

SUMMARY OF RESULTS

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1. Introduction

- 1.1. This report summarises the results of a proficiency testing programme on the determination of the migration of antimony, barium, cadmium, chromium and lead from paint coating according to the method stipulated in the European Standard EN71 Part 3:1994.
- 1.2. The programme was organised by Hong Kong Government Laboratory and Hong Kong Accreditation Service (HKAS) under the auspices of Asia-Pacific Laboratory Accreditation Co-operation (APLAC).
- 1.3. A total of 71 laboratories participated in this programme. Participants' confidentiality is assured by identifying each laboratory with a uniquely assigned code.

2. Objective

- 2.1. The programme aims at providing a means for participating laboratories to evaluate their performance in the determination of the migration of antimony, barium, cadmium, chromium and lead from paint coating according to EN71 Part 3:1994.
- 2.2. Test results from all participating laboratories are evaluated according to the statistical techniques outlined in ISO5725-2:1994. The statistical value of z-score is provided as a numerical indicator to reveal each participating laboratory's proficiency relative to others.

3. Samples

- 3.1. Metal solution

A bulk volume of acidic aqueous solution (1 M HCl) containing antimony, barium, cadmium, chromium and lead at particular levels was prepared. Aliquots of 50 mL were delivered into plastic bottles which had been acid-washed and verified to be clean for the intended purpose.

Element	Level, µg/ml
Antimony	0.20
Barium	0.50
Cadmium	0.25
Chromium	0.30
Lead	0.45

- 3.2 Aluminium plates each coated with approximately 2 g of paint material were prepared. Five plates were randomly selected for assessing the test material homogeneity. The results of the homogeneity test (Appendix I) confirmed that the material was sufficiently homogenous for the purpose of this proficiency test.
- 3.3 Metal solution and plate samples together with {Instructions to accreditation bodies}, {Receipt form}, {Instructions to participating laboratories} & {Results proforma} were distributed to participating accreditation bodies by HKAS in December 2003. A specimen copy of these instructions was given in Appendix II. Each participating laboratory received a set of metal solution and test samples of coated plates from its accreditation body.
- 3.4 A total of 62 participating laboratories submitted their results.

4. Test procedures

- 4.1. Metal solution
- 4.1.1. Each participating laboratory was required to determine the levels of antimony, barium, cadmium, chromium and lead in the metal solution sample.
- 4.2. Coated plates
- 4.2.1. Each participating laboratory was required to determine the migration of antimony, barium, cadmium, chromium and lead from the paint coating of the two plate samples according to EN71 Part 3:1994.

5. Test results and statistical treatment

- 5.1. Test results
- 5.1.1. Test results and relevant information submitted by the participating laboratories were summarised in Tables 1 to 4 in Appendix III. The original data for metal solution and the two coated plates were tabulated in Tables 1 to 3 respectively. A summary of the test parameters employed by the participating laboratories was presented in Table 4.
- 5.1.2. Calculated means and standard deviations were given in Tables 5 to 10 in Appendix III.

5.2. Scrutiny for consistency and outliers

5.2.1 Graphical consistency technique

Graphs of Mandel's b and k consistency statistics were presented in Figures 1 to 7 to indicate laboratories that exhibited markedly different patterns of results from the others. Horizontal lines and dotted lines were drawn as indicators at 1% and 5% significant levels respectively.

5.2.1.1 The b plot for metal solution (Figure 1) showed that Lab.49 (Ba), Lab.70 (Cd, Cr and Pb) and Lab.76 (Sb) stood out as having exceptionally high b values, giving rise to an unusual pattern that nearly all other b values were of negative sign.

5.2.1.2 On the basis of this finding, the relevant data of Labs. 49, 70 and 76 were removed from the subsequent calculations and the corrected b plot for metal solution was given in Figure 2. The plot indicated the following between-laboratory inconsistency at 1% significant level:

- Lab.6 obtained higher test results when analysing Ba and Cr.
- Lab.7 obtained higher test results when analysing Sb.
- Lab.20 obtained lower test results when analysing Cr.
- Lab.44 obtained higher test results when analysing Cd.
- Lab.49 obtained lower test results when analysing Cr and higher test results when analyzing Pb.
- Lab.65 obtained lower test results when analysing Ba.

5.2.1.3 The b plot for coated plate A (Figure 3) revealed the following between-laboratory inconsistency at 1% significant level:

- Lab.33 obtained higher test results when analysing Cd.
- Lab.43 obtained higher test results when analysing Ba.
- Lab.70 obtained higher test results when analysing Ba & Cr.

5.2.1.4 The b plot for coated plate B (Figure 4) revealed the following between-laboratory inconsistency at 1% significant level:

- Lab.20 obtained higher test results when analysing Cd.
- Lab.67 obtained higher test results when analysing Cr.
- Lab.70 obtained higher test results when analysing Ba.

5.2.1.5 The k plots (Figures 5 to 7) showed that the following laboratories yielded rather large variability between replicate test results at 1% significant level :

For metal solution (Figure 5)

- Lab.76 when analysing Sb.
- Lab.49 when analysing Ba.
- Lab.70 when analysing Cd.
- Lab.70 when analysing Cr.
- Lab.49 & 70 when analysing Pb.

For coated plate A (Figure 6)

- Lab.6, 22, 25 & 43 when analysing Ba.
- Lab.18 & 64 when analysing Cd.
- Lab.18, 64, 70 & 72 when analysing Cr.
- Lab.18, 22, 27 & 60 when analysing Pb.

For coated plate B (Figure 7)

- Lab. 43 when analysing Ba.
- Lab. 19, 43, 60 & 64 when analysing Cd.
- Lab. 18, 43 & 64 when analysing Cr.
- Lab. 70 when analysing Pb.

(Note: Labs. 18, 26, 28, 34, 39 and 40 have reported that the testing procedures employed for examining the coated plates deviated from EN71-3:1994)

5.2.2 Numerical outlier technique

5.2.2.1 Cochran's tests were applied to the standard deviation data. Standard deviation data reported by laboratories which were regarded as statistical outliers were indicated by a double and single asterisk respectively in Tables 5 to 7 in Appendix III. The findings were summarised as follows:

<Cochran's Tests>						
		Sb	Ba	Cd	Cr	Pb
Metal solution	Outlier	3, 5,	3, 6,	2, 19,	3, 5	2, 3,
		10, 48,	20, 38,	20, 28,	6, 38	16, 17,
		70, 76	49, 76	33, 41,	70	20, 28,
				44, 49,		31, 49,
Coated plate A	Outlier			65, 70,		65, 76
				76		
		22, 27,	6, 22	18, 19,	6, 18,	18, 22
		43	25, 43	22, 43,	21, 22,	27, 60
Coated plate B	Outlier			60, 64,	28, 43,	64
				72	53, 60,	
					64, 70,	
					72	
Coated plate B	Outlier	6, 22,	43, 64	19, 43	18, 43	18, 19,
		43, 60,		60, 64	64	43, 48,
		64				60, 64,
						70

5.2.2.2 After excluding outliers identified from Cochran's test, Grubbs' tests were applied to the means of the reported metal concentration data to identify extreme values. Mean data reported by laboratories which were regarded as statistical outliers or stragglers were indicated by a double and single asterisk respectively in Tables 8 to 10 in Appendix III. The findings were summarised as follows:

<Grubbs' Test>						
		Sb	Ba	Cd	Cr	Pb
Metal solution	Straggler	-	-	47	-	-
	Outlier	7, 20,	2, 5,	7, 18	19, 20,	33, 70
		22, 28,	7, 16,		24, 39,	
		40, 49,	28, 65,		49	
Coated plate A	Straggler	-	7, 20	33, 40	-	-
	Outlier	-	21, 65	-	-	-
			70			
Coated plate B	Straggler	-	22, 70	-	-	-
	Outlier	-	-	-	-	-

(Note: Labs. 18, 26, 28, 34, 39 and 40 have reported that the testing procedures employed for examining the coated plates deviated from EN71-3:1994)

5.2.3 Results reported by identified outliers, results received late after submission deadline, and/or results of participants declaring adoption of procedures deviated from EN71 Part 3:1994 were excluded in the computation of the following statistical parameters, whereas data from identified stragglers were retained for the computation:

- General mean (m)
- Repeatability standard deviation (S_r)
- Reproducibility standard deviation (S_R)

The computed values are given in Appendix IV.

5.3. Performance evaluation

5.3.1. The performance of each participating laboratory was evaluated by means of a performance index, z-score which was calculated as follows:

$$z = \frac{x_i - m}{S}$$

where x_i = mean value of test results

m = computed general mean

S = computed reproducibility standard deviation i.e. S_R

5.3.2 The z-scores were tabulated in Tables 11 to 13 in Appendix V and illustrated graphically in Figures 8 to 22. The z-scores are commonly interpreted as follows:

- | | | |
|-----|---------------|----------------|
| (a) | $ z \leq 2$ | Satisfactory |
| (b) | $2 < z < 3$ | Questionable |
| (c) | $ z \geq 3$ | Unsatisfactory |

6. Conclusion

The performance of the majority of participating laboratories was satisfactory. More than 90% of the coated plate test results reported by the participating laboratories achieved satisfactory z-scores.

7. Recommendations

- 7.1. Laboratories with extreme test results or poor repeatability as revealed in Mandel's b and k plots were essentially identified as outliers or stragglers in the subsequent numeric statistical tests. These laboratories should identify the cause of the discrepancies.
- 7.2. Laboratories identified as having large within-laboratory and/or between-laboratory inconsistencies in analysing the provided metal solution sample should review their instrumental operation and analytical procedures.
- 7.3. Laboratories with unsatisfactory z-scores should review their instrumental operation and analytical procedures to investigate the underlying reason for the observed z-scores. It was noted that some laboratories obtained good z-score but failed the Cochran's test. These laboratories need to find out the reason leading to such a within-laboratory inconsistency.

8. References

- 8.1 International Standard ISO 5725-2:1994(E) "Accuracy (trueness and precision) of measurement methods and results – Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method".
- 8.2 European Standard EN 71-3:1994 "Safety of Toys – Part 3: Migration of Certain Elements" with the incorporation of amendment A1:2000.

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Assessing the test materials for homogeneity

1. Five coated plates were randomly selected.
2. The migration of antimony, barium, cadmium, chromium and lead from the paint coating was determined in triplicate according to EN71 Part 3:1994.
3. The sampling variance (S_s^2) and the analytical variance (S_a^2) were estimated by using one-way analysis of variance, without exclusion of outliers.
4. Values of the mean ($\bar{x}$), the sampling standard deviation (S_s), the analytical standard deviation (S_a) and the results of the F-test are given as below:

Element	$\bar{x}$, mg/kg	S_s	S_a	σ	S_s/σ	F	F_{critical}
Sb	191.2	6.297	7.328	76.5	0.082	3.22	
Ba	285.9	13.85	6.630	114.3	0.121	14.1*	
Cd	2731	88.59	82.54	1092	0.081	4.46*	3.48
Cr	668.4	31.81	22.76	267.3	0.119	6.86*	
Pb	8081	461.2	273.6	3232	0.143	9.52*	

* Although there were significant between-sample differences in respect of barium, cadmium, chromium and lead, the material was considered sufficiently homogeneous for the purpose of this proficiency test, as the respective values of S_s/σ was less than the maximum recommended value of 0.3. (σ is the target value for reference standard deviation and is set at the value of 40%R.S.D.).

HONG KONG GOVERNMENT LABORATORY

IN COLLABORATION WITH

HONG KONG ACCREDITATION SERVICE (HKAS)**APLAC T039 TOY SAFETY PROFICIENCY TESTING PROGRAMME****INSTRUCTIONS TO ACCREDITATION BODIES****1. Samples**

Each participating laboratory is given a sample pack containing the following:

- (A) two aluminium sheets coated with approximately 2 g of paint material; and
- (B) one plastic tube with metal solution in 1 M hydrochloric acid.

Upon receipt of the sample pack from HKAS, participating accreditation bodies should check the sample for damage, if any, and acknowledge receipt of the sample by returning the Receipt Form (FORM 02) to HKAS via e-mail or by fax (+852 2824 1302).

2. Tests to be performed

(A) The coated aluminium sheets:

Each participating laboratory is required to determine the migration of antimony, barium, cadmium, chromium, and lead from the paint coating of the aluminium sheets (*marked as SxxxA and SxxxB respectively, where xxx is the serial number*) in accordance with test procedures given in EN 71 Part 3:1994. For both samples, the determination should be conducted in triplicate. (*Precaution: in removing the paint from surface of samples, avoid scraping any of the substratum aluminium material*).

(B) The plastic tube of metal solution in 1 M hydrochloric acid:

Each participating laboratory is required to determine the levels of antimony, barium, cadmium, chromium, and lead in the sample of metal solution using the same instrumentation technique employed for analysis of the coated aluminium sheets. The determination should be conducted in triplicate.

3. Sample distribution

The samples, Instructions to Laboratories (FORM 03), and Results Proforma (FORM 04) should be distributed to participating laboratories as soon as possible.

Laboratories will have about four weeks to analyse the samples.

4. Documents to be submitted

Accreditation bodies should collect the completed Results Proforma (FORM 04) from the participating laboratories on or before **15 March 2004**, and forward the Results Proforma to HKAS before **31 March 2004**.

5. Enquiries

Please contact:- Dr. P. C. Ng (HKAS)

36/F, Immigration Tower, 7 Gloucester Road, Hong Kong

Fax: +852 2824 1302 Tel.: +852 2829 4808

Email: hkas@itc.gov.hk

HONG KONG GOVERNMENT LABORATORY

IN COLLABORATION WITH

HONG KONG ACCREDITATION SERVICE (HKAS)**APLAC T039 TOY SAFETY PROFICIENCY TESTING PROGRAMME****RECEIPT FORM**

<To be completed by Participating Accreditation Body>

From:
Participating Accreditation Body.....
*Contact Person*To: Hong Kong Accreditation Service
36/F Immigration Tower,
7 Gloucester Road,
Hong Kong.

Fax:

Attn.: Dr. P. C. Ng

Tel.:

Fax: +852 2824 1302

Email:

Tel.: +852 2829 4808

Date:

Email: hkas@itc.gov.hk

Please complete the underlined area.

This is to acknowledge the receipt of the APLAC T039 sample.

After inspection, the sample was found (☐damaged / ☐ intact)* and were deemed (☐ suitable / ☐ not suitable)* for testing.

REMARKS :

* Tick as appropriate

HONG KONG GOVERNMENT LABORATORY

IN COLLABORATION WITH

HONG KONG ACCREDITATION SERVICE (HKAS)

APLAC T039 TOY SAFETY PROFICIENCY TESTING PROGRAMME**INSTRUCTIONS TO PARTICIPATING LABORATORIES**Laboratory Code Number[†]:**1. Samples**

Please check whether you are provided with the following:

- (A) two aluminium sheets coated with approximately 2 g of paint material; and
- (B) one plastic tube with metal solution in 1 M hydrochloric acid.

2. Tests to be performed

(A) The coated aluminium sheets:

Each participating laboratory is required to determine the migration of antimony, barium, cadmium, chromium, and lead from the paint coating of the aluminium sheets (*marked as SxxxA and SxxxB respectively, where xxx is the serial number*) in accordance with test procedures given in EN 71 Part 3:1994. For both samples, the determination should be conducted in triplicate. (*Precaution: in removing the paint from surface of samples, avoid scraping any of the substratum aluminium material*).

(B) The plastic tube of metal solution in 1 M hydrochloric acid:

Each participating laboratory is required to determine the levels of antimony, barium, cadmium, chromium, and lead in the sample of metal solution using the same instrumentation technique employed for analysis of the coated aluminium sheets. The determination should be conducted in triplicate.

3. Reporting

Report all the replicate data in the Results Proforma (FORM 04) and complete both Part I and Part II. **DO NOT** adjust the analytical results as described in Clause 4.2 (Interpretation of results) of EN 71 Part 3:1994.

4. Documents to be submitted

Submit the completed Results Proforma to your accreditation body on or before **15 March 2004**.

5. Enquires

Please contact your accreditation body for general enquiry concerning the program.
Detailed information of the program may be obtained from:-

Dr. P. C. Ng (HKAS)
36/F, Immigration Tower, 7 Gloucester Road, Hong Kong
Fax: +852 2824 1302 Tel.: +852 2829 4808
Email: hkas@itc.gov.hk

[†] Assigned by HKAS

HONG KONG GOVERNMENT LABORATORY

IN COLLABORATION WITH

HONG KONG ACCREDITATION SERVICE (HKAS)

APLAC T039 TOY SAFETY PROFICIENCY TESTING PROGRAMME**RESULTS PROFORMA**

<Both Part I & II should be completed>

Laboratory Code Number[†]: Date of Analysis:

Name of Laboratory:

Part I: Analytical Data

(A) The coated aluminium sheets

Sample Number:

Elements	Quantity of Migrated Element, mg/kg [§]				Expanded Uncertainty, U, mg/kg	Coverage Factor, k
	Replicate 1	Replicate 2	Replicate 3	Mean		
Antimony						
Barium						
Cadmium						
Chromium						
Lead						

Sample Number:

Elements	Quantity of Migrated Element, mg/kg [§]				Expanded Uncertainty, U, mg/kg	Coverage Factor, k
	Replicate 1	Replicate 2	Replicate 3	Mean		
Antimony						
Barium						
Cadmium						
Chromium						
Lead						

(B) The metal solution in 1 M hydrochloric acid

Elements	Quantity of Soluble Element, mg/L [§]				Expanded Uncertainty, U, mg/L	Coverage Factor, k
	Replicate 1	Replicate 2	Replicate 3	Mean		
Antimony						
Barium						
Cadmium						
Chromium						
Lead						

[§] Report values to 3 significant Figure or 3 decimal places, whichever is appropriate[†] Assigned by HKAS

HONG KONG GOVERNMENT LABORATORY

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HONG KONG ACCREDITATION SERVICE (HKAS)

APLAC T039 TOY SAFETY PROFICIENCY TESTING PROGRAMME**Part II: Test Parameters**☐ Tick as appropriate

1. Instrumental technique(s): ☐ ICP-OES
☐ ICP-MS
☐ FAAS
☐ Others
(Please specify)
2. Scrapping tool: ☐ Razor blade
☐ Surgical blade
☐ Scalpel blade
☐ Cutter knife
☐ Others
(Please specify)
3. Comminution ☐ Not performed
☐ Performed
(Please specify how it was accomplished)
4. Necessity to adjust pH: ☐ No need to adjust, pH found to be
☐ pH adjusted to
.....
5. Agitation means: ☐ Shaking water bath atrev./min.
☐ Wrist action shaker atrev./min.
☐ Others at rev./min.
6. Centrifugation: ☐ Not performed
☐ Performed
7. Deviation, if any,
from EN 71-3:1994:
.....
.....
.....
8. Other comments:
.....
.....

Submission of this Results Proforma via:

☐ E-mail ☐ FaxCompleted by: /
(Name with signature / Post)

Date:

Summary of test results

Table 1 Original data – Metal solution

Lab. no.	Sb			Ba			Cd			Cr			Pb		
	Unit: µg/ml														
1	0.199	0.190	0.201	0.497	0.506	0.502	0.246	0.246	0.246	0.296	0.297	0.296	0.436	0.439	0.437
2	<1.50	<1.50	<1.50	0.182	0.189	0.188	0.239	0.205	0.219	0.283	0.287	0.304	0.312	0.288	0.369
3	0.316	0.274	0.299	0.554	0.490	0.434	0.258	0.251	0.268	0.231	0.278	0.265	0.438	0.554	0.488
4	0.209	0.218	0.208	0.498	0.497	0.493	0.246	0.246	0.243	0.297	0.297	0.295	0.463	0.462	0.446
5	0.315	0.210	0.263	0.250	0.250	0.250	0.240	0.237	0.240	0.200	0.236	0.236	0.357	0.375	0.375
6	0.155	0.180	0.171	0.848	0.688	0.729	0.240	0.258	0.251	0.791	0.714	0.804	0.524	0.570	0.549
7	1.490	1.500	1.490	0.700	0.710	0.710	0.320	0.320	0.320	0.260	0.250	0.250	0.390	0.400	0.400
8	0.202	0.206	0.207	0.445	0.450	0.450	0.233	0.231	0.231	0.304	0.297	0.288	0.571	0.519	0.534
9	0.210	0.210	0.210	0.490	0.490	0.490	0.260	0.260	0.260	0.290	0.290	0.290	0.470	0.460	0.470
10	0.331	0.288	0.272	0.442	0.440	0.440	0.217	0.229	0.230	0.268	0.269	0.270	0.408	0.411	0.409
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	0.201	0.199	0.195	0.494	0.500	0.501	0.245	0.249	0.249	0.293	0.297	0.298	0.440	0.447	0.445
13	0.207	0.189	0.215	0.475	0.482	0.472	0.239	0.242	0.240	0.290	0.294	0.283	0.435	0.423	0.424
14	0.207	0.207	0.210	0.493	0.496	0.491	0.242	0.244	0.245	0.295	0.297	0.298	0.461	0.468	0.467
15	0.210	-	-	0.490	-	-	0.270	-	-	0.300	-	-	0.440	-	-
16	0.160	0.170	0.180	0.200	0.200	0.200	0.250	0.250	0.250	0.250	0.250	0.250	0.900	1.000	0.900
17	0.245 (<1)	0.242 (<1)	0.230 (<1)	<10	<10	<10	0.257	0.259	0.259	0.294	0.308	0.285	0.411	0.481	0.448
18	-	-	-	-	-	-	0.043	0.045	0.041	0.327	0.328	0.317	0.495	0.493	0.477
19	0.215	0.218	0.221	0.517	0.531	0.530	0.223	0.257	0.252	0.373	0.388	0.386	0.446	0.454	0.441
20	0.008	-0.028	-0.008	-0.950	-1.330	-0.1	0.350	0.250	0.250	0.020	0.019	0.019	0.800	1.030	0.850
21	0.210	0.207	0.208	0.472	0.473	0.462	0.237	0.237	0.233	0.268	0.274	0.272	0.426	0.421	0.437
22	0.340	0.343	0.333	0.435	0.438	0.433	0.247	0.247	0.246	0.293	0.292	0.292	0.455	0.455	0.452
23	0.508	0.519	-	0.369	-	-	0.272	0.280	-	0.336	-	-	0.419	0.435	-
24	0.210	0.206	0.206	0.518	0.504	0.506	0.260	0.254	0.250	0.385	0.371	0.368	0.467	0.441	0.437
25	-	-	-	-	-	-	0.222	0.224	0.219	-	-	-	0.546	0.537	0.559
26	0.209	0.202	0.203	0.502	0.506	0.512	0.265	0.272	0.27	0.305	0.309	0.312	0.471	0.472	0.478
27	0.230	0.238	0.223	0.514	0.523	0.539	0.286	0.291	0.280	0.316	0.327	0.329	0.540	0.590	0.562
28	0.036	0.030	0.024	0.192	0.198	0.218	0.316	0.278	0.270	0.304	0.289	0.288	0.514	0.664	0.695
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	0.190	0.195	0.199	0.449	0.469	0.473	0.238	0.244	0.245	0.312	0.317	0.327	0.415	0.425	0.435
31	<0.4 (LD)	<0.4 (LD)	<0.4 (LD)	<0.4 (LD)	<0.4 (LD)	<0.4 (LD)	0.279	0.283	0.275	0.296	0.296	0.306	0.585	0.549	0.512
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	-	-	-	-	-	-	0.450	0.410	0.430	0.260	0.260	0.260	0.260	0.260	0.260
34	0.238	0.211	0.226	0.504	0.490	0.489	0.243	0.241	0.255	0.294	0.292	0.286	0.447	0.439	0.443
35	-	-	-	-	-	-	0.246	0.250	0.253	0.246	0.254	0.255	0.445	0.447	0.433
36	0.192	0.188	0.196	0.496	0.494	0.492	0.257	0.255	0.256	0.254	0.253	0.251	0.470	0.470	0.480
37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	0.219	0.210	0.198	0.475	0.506	0.535	0.247	0.242	0.245	0.331	0.314	0.294	0.461	0.456	0.436
39	-	-	-	-	-	-	0.255	0.254	0.255	0.391	0.396	0.396	0.480	0.480	0.480
40	0.315	0.305	0.311	0.481	0.475	0.480	0.281	0.282	0.285	0.301	0.296	0.292	0.562	0.569	0.554
41	0.242	0.249	0.237	0.453	0.437	0.451	0.233	0.254	0.230	0.276	0.283	0.272	0.432	0.439	0.426
42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	0.216	0.214	0.213	0.469	0.482	0.490	0.221	0.208	0.202	0.275	0.282	0.283	0.484	0.460	0.446
44	0.230	0.230	0.240	0.430	0.420	0.410	1.620	1.640	1.660	0.280	0.280	0.280	0.470	0.470	0.460
45^	0.199	0.186	0.194	0.507	0.512	0.526	0.224	0.208	0.211	0.312	0.303	0.324	0.436	0.406	0.399

i. Symbol “-” denotes that laboratory did not submit data.

ii. Symbol “^” denotes that the laboratory results were received after the submission deadline.

Table 1(cont.)

Original data – Metal solution

Lab. no.	Sb			Ba			Cd			Cr			Unit: µg/ml Pb		
46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	0.236	0.239	0.231	0.453	0.464	0.449	0.189	0.190	0.189	0.285	0.289	0.285	0.380	0.385	0.393
48	0.420	0.400	0.370	0.490	0.480	0.480	0.250	0.240	0.250	0.290	0.280	0.290	0.430	0.420	0.430
49	0.075	0.074	0.085	6.520	5.310	4.180	0.250	0.390	0.000	0	0	0	2.960	1.970	0
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51	0.220	0.210	0.190	0.410	0.430	0.440	0.250	0.250	0.260	0.300	0.310	0.310	0.520	0.520	0.530
52	0.211	0.210	0.211	0.533	0.534	0.539	0.267	0.271	0.269	0.268	0.267	0.266	0.469	0.478	0.471
53	0.185	0.174	0.176	0.415	0.408	0.424	0.231	0.224	0.225	0.292	0.298	0.295	0.470	0.455	0.465
54	0.224	0.218	0.207	0.492	0.495	0.491	0.250	0.251	0.249	0.278	0.282	0.278	0.432	0.436	0.436
55	0.219	0.220	0.217	0.498	0.501	0.499	0.258	0.256	0.259	0.290	0.291	0.289	0.469	0.466	0.463
56	0.289	0.291	0.285	0.493	0.492	0.490	0.245	0.247	0.249	0.296	0.292	0.291	0.508	0.494	0.492
57	0.190	0.195	0.199	0.449	0.469	0.473	0.238	0.244	0.245	0.312	0.317	0.327	0.415	0.425	0.435
58	0.201	0.200	0.203	0.502	0.515	0.524	0.235	0.241	0.246	0.294	0.297	0.292	0.460	0.467	0.478
59	0.222	0.226	0.237	0.493	0.494	0.496	0.248	0.245	0.248	0.295	0.292	0.301	0.444	0.447	0.460
60	0.213	0.210	0.200	0.471	0.468	0.463	0.244	0.243	0.241	0.305	0.304	0.299	0.421	0.410	0.392
61	0.212	0.212	0.211	0.483	0.491	0.481	0.238	0.240	0.236	0.290	0.296	0.285	0.438	0.433	0.426
62	0.215	0.212	0.210	0.511	0.514	0.512	0.256	0.253	0.256	0.305	0.309	0.305	0.461	0.462	0.467
63	0.216	0.227	0.213	0.502	0.500	0.487	0.237	0.251	0.241	0.293	0.301	0.310	0.451	0.472	0.453
64	0.191	0.191	0.190	0.491	0.488	0.484	0.250	0.250	0.250	0.297	0.297	0.298	0.439	0.449	0.444
65	0.029	0.031	0.032	0.100	0.080	0.090	0.250	0.300	0.280	0.290	0.280	0.300	0.350	0.370	0.310
67	0.189	0.2	0.189	0.505	0.506	0.505	0.264	0.268	0.267	0.297	0.299	0.299	0.508	0.511	0.511
69	0.209	0.202	0.204	0.497	0.500	0.501	0.234	0.232	0.233	0.309	0.309	0.310	0.419	0.418	0.415
70	0.01	0.11	0.11	0	0	0	28	25	26	21	23	20	40	38	39
72	0.202	0.201	0.205	0.440	0.450	0.460	0.270	0.270	0.270	0.300	0.310	0.300	0.480	0.480	0.490
74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
76	26	24	26	0.24	0.2	0.18	0.2	0.22	0.2	0.28	0.28	0.26	0.44	0.48	0.52

i. Symbol “-” denotes that laboratory did not submit data.

ii. Symbol “^” denotes that the laboratory results were received after the submission deadline.

Table 2 Original data – Coated plate A

Unit: mg/kg

Lab. no.	Sb			Ba			Cd			Cr			Pb		
1	160	165	169	256	268	266	2250	2440	2420	536	605	594	6340	7360	7290
2	122.08	122.08	122.08	313.54	318.53	313.53	595.45	605.4	592.96	513.17	520.63	513.16	195.27	202.1	202.23
3	168	178	182	241	249	274	1913	1992	2021	498	483	487	6405	6441	6422
4	197.82	195.1	198.84	301.4	291.73	296.96	2730.64	2625.77	2643.15	730.12	706.74	714.16	8738.91	8471.52	8655.53
5	164.5	164.5	159	300	306	303	1164.5	1160.5	1151.5	459.5	463	458	486.5	482	484
6	215	219	219	428	436	532	2108	2143	2243	543	559	633	3612	4396	3582
7	174.9	174.9	174.8	461.3	461.3	461.1	1808.2	1808.1	1808.2	645.1	645.1	645.3	2542.2	2542.2	2542.2
8	134.1	135.1	133.8	176.3	177.5	176.5	1144	1153	1132	558	558	554	425	427	427
9	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	24.5	25.5	24
10	167.8	164.4	-	249.7	266.1	-	3197.9	3234.6	-	570	581	-	7337	7606	-
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	177	178	179	298	296	299	2190	2310	2280	581	585	588	7300	7290	7360
13	161	160	163	307	311	300	2000	2030	2020	536	547	545	6990	7110	7010
14	212	231	225	334	346	339	3017	2871	2931	787	775	807	9079	9331	9360
15	298	-	-	261	-	-	2014	-	-	610	-	-	3052	-	-
16	114	110	109	230	240	210	1505	1445	1445	440	420	425	873	828	837
17	193 (157)	196 (153)	195 (141)	294	289	276	1990	2090	1950	522	536	536	3460	3850	3120
18	-	-	-	-	-	-	3570	4310	2310	505	694	216	10700	7810	8840
19	246	247	244	371	361	351	3848	4163	4305	1044	1050	1069	11251	10188	10314
20	160	152	169	555	544	548	588	588	573	528	526	520	14619	14822	14579
21	173	170	161	594	596	611	2780	2870	3010	646	662	730	6650	6480	6930
22	329.5	371.7	308.3	687.5	752.8	638.2	2177	2879	2361	622	706.2	569	3720	5967	4520
23	139.5	151.35	-	-	-	-	1569.2	1693	-	-	-	-	1972	2160.4	-
24	104	103	98	288	293	295	1280	1210	1230	450	461	444	519	463	457
25	175	167	163	531	489	614	1850	1782	1818	385	378	390	6849	6661	6693
26	106.5	102	105.1	230.1	221.4	233.5	1979.1	1839.9	2000.3	592.8	606.5	597.3	1557.8	1654	1514.4
27	172.5	190.6	154.4	266.7	267.3	243.4	2904	2929	2793	617.1	600.1	627.3	10028	11844	10059
28	68	70	66	279	280	276	2560	2530	2590	590	650	710	7940	8270	8360
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	156	161	168	284	294	306	2010	2080	2170	515	537	551	6720	6920	7150
31	88.7	109	103	262	263	262	1374	1366	1363	548	553	556	4516	4516	4516
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	297.030	294.490	284.381	-	-	-	5599.090	5595.870	5597.480	451.930	431.241	441.586	5283.770	5213.350	5335.060
34	16.04	15.44	15.67	115.6	113	117.1	323.1	327.6	330.9	78.36	78.96	82.18	856.6	900.2	908.8
35	-	-	-	-	-	-	1992	1863	1911	500	456	477	4272	3676	3858
36	124	128	128	252	252	249	1182	1180	1157	552	551	555	607	604	604
37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	139	149	160	450	470	444	1500	1480	1460	490	486	472	343	334	332
39	-	-	-	-	-	-	527.92	534.97	536.39	135.22	135	135.79	1050.19	1055.83	1055.83
40	206.5	205.3	202.6	219.1	222.1	224.3	4576	4566	4597	1065	1076	1086	13240	13360	13620
41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	161	203	204	838	706	653	1693	2265	2205	436	639	624	3138	3986	3887
44	78.9	85.5	80.9	377	398.3	378.2	2160	2090	2176	389.6	385.3	383.9	4380	4563	4382
45 [^]	171.5	177.6	181.3	296.2	274.3	287.5	2224.2	2314.5	2430	633.4	588.7	658.1	3974.7	3654.3	3820.6

i. Symbol “-” denotes that laboratory did not submit data.

ii. Symbol “[^]” denotes that the laboratory results were received after the submission deadline.

Table 2(cont.)

Original data – Coated plate A

Unit: mg/kg

Lab. no.	Sb			Ba			Cd			Cr			Pb		
46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	167	173	166	260	255	258	1940	1930	2020	628	633	626	3470	3550	3430
48	304.1	284.9	294.9	405	407.2	415.2	3947.1	3855.4	4159.2	1021.3	973.5	997.2	11721.9	10814.8	11279.4
49	273.76	258.13	252.98	427.74	384.2	395.83	3891.05	3886.2	3900.05	931.07	962.64	970.36	11346.58	11066.74	11126.61
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51	228	222	222	308	313.5	313.5	2675	2725	2725	880	885.5	896.5	10500	10800	10600
52	39.3	43.2	30.3	107	123	92.5	617	799	471	129	171	108	1950	2510	1710
53	143	158	154	248	244	268	1980	2057	1760	661	609	580	7640	7636	7500
54	152	161	162	256	272	277	1790	1930	1870	441	471	468	5670	6040	5890
55	222	230	220	321	318	310	3220	3180	3230	865	863	853	9870	9840	10300
56	144.3	151.4	155.2	259.6	263.2	268.9	2348	2319.5	2261	585	581.1	573.5	5935	6194.5	6210
57	127	131	135	268	278	286	1550	1600	1650	383	390	411	4610	4730	4920
58	239	234	236	347	378	379	3530	3650	3550	1060	1050	1110	11100	10900	11800
59	184	192	186	323	341	329	2600	2730	2690	721	741	724	8800	9120	8760
60	205	205	221	361	371	398	3170	3630	3860	858	893	961	10300	11500	12400
61	197	200	192	314	313	312	2410	2580	2440	744	743	732	9960	9820	9960
62	201	200	192	270	275	275	2930	2970	2970	768	779	779	9890	9990	9960
63	177	187	180	311	311	338	2634	2635	2716	619	628	622	7602	7708	7558
64	142	161	169	284	338	317	3720	2920	3790	1060	801	1050	12100	10600	10900
65	38	41	39	585	610	598	2200	2150	2050	689	650	685	7480	7210	6990
67	210.552	210.061	211.575	288.409	290.904	290.405	1041.718	1045.358	1040.9	1331.697	1335.264	1332.27	224.95	224.049	224.54
69	220	217	222	328	323	324	3470	3530	3560	884	902	918	11000	11200	11200
70	0.27	0.25	0.28	780	750	760	3300	3500	3400	7500	7200	7800	10100	10200	10300
72	222	249	229	316	330	352	2740	3100	3210	816	1170	1180	9360	9340	8890
74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
76	12	12	12	234	222	221	1375	1350	1325	532	533	532	3980	3500	3575

i. Symbol “-” denotes that laboratory did not submit data.

ii. Symbol “^” denotes that the laboratory results were received after the submission deadline.

Table 3 Original data – Coated plate B

Unit: mg/kg

Lab. no.	Sb			Ba			Cd			Cr			Pb		
1	123	127	126	247	245	245	1870	1850	1880	464	450	450	5300	5540	5610
2	148.46	152.95	154.44	286.58	293.05	291.05	1320.23	1345.12	1330.18	508.09	523.02	518.04	742.26	757.06	747.22
3	196	186	188	239	259	272	2259	2151	2019	475	522	503	6691	6532	6501
4	231.93	230.93	238.55	323.61	322.06	328.14	3408.45	3250.92	3422.03	921.2	893	921.49	11032.61	10803.21	11100.59
5	150.5	153.5	148	290.5	296.5	296.5	668	661	670	398.5	399	402	214.5	216.5	212.5
6	216	250	267	471	449	474	2280	2387	2435	411	450	487	4923	5555	4730
7	183.4	183.4	183.4	434.7	434.8	434.5	1932.2	1932.2	1932.2	721.1	721	721.1	3624.3	3624.2	3624.1
8	138	141	138	148	149	147	560	560	561	643	642	659	183	181	182
9	<5	<5	<5	8	<5	<5	5.5	<5	<5	6	<5	<5	70	30	26.5
10	167.6	158.9	-	293.3	263.3	-	3128.8	3094.4	-	674.6	678.1	-	9537	9438	-
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	178	177	172	296	285	287	2610	2490	2340	650	631	611	8180	7830	7480
13	148	151	148	269	306	263	1800	1900	1790	508	510	493	6550	6600	6450
14	204	208	221	339	333	342	3301	3051	3085	805	765	791	8928	9300	9129
15	306	-	-	272	-	-	1872	-	-	570	-	-	2638	-	-
16	114	113	107	240	250	235	1370	1325	1300	465	445	390	805	788	768
17	188 (153)	186 (139)	203 (148)	276	268	284	2010	2060	2080	524	525	549	2490	2200	1710
18	-	-	-	-	-	-	1860	1910	1980	416	513	620	7760	5890	6570
19	244	226	223	356	328	330	2590	3548	3406	933	951	935	4735	3268	5560
20	136	133	143	486	496	513	5290	5340	5239	546	542	553	12141	11788	11587
21	167	170	173	575	596	590	2580	2590	2820	580	617	624	6530	6840	6950
22	308.3	339.4	348.7	686.5	693.2	669.4	2478	2542	2461	629.8	670.9	588.8	4709	4160	4699
23	131.6	133.25	-	-	-	-	1414.2	1366.7	-	-	-	-	1917.7	1862.7	-
24	102	102	98	279	291	278	1380	1470	1540	409	414	390	803	905	983
25	151	158	155	553	560	568	1780	1746	1792	359	362	360	6481	6371	6324
26	104.4	109.2	107.6	234.2	239.9	237	1800.4	1925.4	1823.2	659.9	679.5	671.5	1386.1	1407.6	1325.6
27	135.2	131.6	132	225.0	207.3	218.4	2354	2565	2467	526.8	506.5	569.7	8547	9006	8621
28	40	34	20	247	254	249	2060	2070	2050	460	580	500	7100	7100	7210
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	159	164	168	286	298	309	2160	2230	2280	548	562	583	7640	7880	8050
31	101	125	118	247	245	238	1008	997	990	480	433	471	2902	2850	2692
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	299.700	299.700	299.700	-	-	-	4738.680	4556.690	4647.685	438.860	445.781	442.325	5904.010	5678.790	5678.790
34	18.52	18.17	17.84	126.6	130.6	132	360.6	358.6	362.8	87.88	94.7	91.13	914.8	959.7	943.6
35	-	-	-	-	-	-	2178	1785	1932	515	441	454	3912	3528	3828
36	99.5	98.2	97.9	271	272	267	659	659	646	474	473	478	223	222	224
37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	163	164	169	551	534	555	2430	2390	2410	560	548	566	626	619	610
39	-	-	-	-	-	-	369.35	371.37	369.35	123.94	124	124.18	817.41	817.41	817.41
40	197.2	197	195.4	229.3	225.2	225.0	3837	3842	3817	953.4	948.0	938.2	9994	10160	10320
41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	153	215	215	534	621	718	1587	2174	2193	403	640	651	1955	3701	3884
44	96.9	105.7	88.6	463.1	452.8	422.9	2679	3008	2621	545.4	503.2	451.7	5618	5617	5018
45 [^]	190	168.1	176.3	303.1	286.6	312.5	2532.9	2265.3	2650	712.5	638.4	686.8	2842.7	2670.6	2950

i. Symbol “-” denotes that laboratory did not submit data.

ii. Symbol “[^]” denotes that the laboratory results were received after the submission deadline.

Table 3(cont.)

Original data – Coated plate B

Unit: mg/kg

Lat no.	Sb			Ba			Cd			Cr			Pb		
46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	164	161	159	246	244	244	2120	2080	2160	632	656	652	4600	4720	4740
48	274.1	254.2	285.2	385.4	376.9	404.5	3635.6	3610.7	3628.4	923.9	893.7	1029.3	10250.6	9908.9	11023.9
49	277.24	266.14	257.94	464.42	466.11	431.97	3625.8	3348.79	3331.34	933.49	863.17	930.43	10156.25	9854.54	9743.4
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51	135	132	135	412.5	407	396	1375	1350	1325	544.5	528	506	4600	4600	4600
52	29.2	34.8	38.3	90	95.3	105	574	695	757	117	148	184	1810	2330	2840
53	165	157	-	258	260	-	2448	2482	-	652	650	-	7746	8076	-
54	180	152	162	287	275	282	1980	1800	1880	528	457	466	6160	5930	5680
55	226	229	234	312	327	323	2960	2990	2880	813	814	809	9490	9520	9510
56	136.9	138.8	144.4	248.4	253.2	258.9	2004.5	2025.2	2059.5	501	514.4	527	5617.6	5826.5	5818.4
57	204	212	224	332	337	352	2870	3040	3100	770	785	811	8560	8740	8890
58	275	265	260	358	360	367	3850	3940	3990	1150	1150	1170	11200	10900	11400
59	203	214	208	324	342	350	3150	3330	3280	830	872	860	9330	9630	9570
60	226	193	229	389	387	385	3400	2910	3520	897	808	889	11700	9880	11500
61	164	170	183	285	291	281	2270	2320	2226	589	608	580	7517	7796	7424
62	210	211	207	347	352	351	3250	3260	3230	834	838	845	9680	9700	9640
63	185	184	192	314	316	317	2320	2335	2334	609	608	605	6827	6732	6645
64	157	128	188	286	289	347	3090	3410	4290	834	984	1210	11200	11900	12900
65	38	32	36	610	589	618	2300	2290	2150	638	630	680	7600	7450	7790
67	189.725	190.728	188.219	330.763	330.261	330.261	1398.843	1399.847	1399.177	1269.85	1272.862	1271.336	1188.54	1189.543	1188.038
69	236	235	234	327	329	325	4080	4130	4170	1060	1070	1070	12700	12900	13000
70	0.27	0.26	0.27	710	750	700	3000	3400	3300	730	650	680	9800	1020	1000
72	263	244	266	316	322	351	3190	3170	3470	895	875	989	10100	10500	10400
74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
76	11	11	11	231	203	193	1350	1425	1250	642	633	653	4365	4355	4445

i. Symbol “-” denotes that laboratory did not submit data.

ii. Symbol “^” denotes that the laboratory results were received after the submission deadline.

Table 4 Summary of test parameters

Lab. no.	Analytical technique	Scraping tool	Comminution / pH adjustment / pH	Agitation means / Speed (rev. per min)	Centrifugation/ Solution stabilisation	Deviation, if any
1	ICP	Cutter knife	NP/NP/1.0	WAS/100	NP/-	-
2	ICP	Razor blade	NP/NP/-	SWB/-	NP/-	-
3	FAAS	Surgical blade	P/NP/<1.5	WAS/130	NP	-
4	ICP	Scalpel blade	P/NP/1.1-1.5	SWB/145	NP/NP	-
5	AAS	Razor blade	NP/P/1.47	SWB/140	NP/-	-
6	FAAS	Surgical blade	NP/NP/1.3	WAS/100	NP/-	-
7	FAAS	Cutter knife	P/NP/1.446	SWB/2	NP	-
8	FAAS	Cutter knife	NP/NP/~2	SWB/120	NP/-	-
9	FAAS	Steel blade	NP/-/1.22	-/-	NP/NP	-
10	ICP	Surgical blade	NP/NP/1-1.5	SWB/100	NP/-	-
11	ICP	Blade	NP/NP/1.2	SWB/200&WAS/135	NP/NP	-
12	ICP	Surgical blade	P/NP/1.2	SWB/180	NP/NP	-
13	ICP	Scalpel blade	P/NP/<1.5	-	NP/-	-
14	ICP	Razor blade	P/NP/1.19	SWB/110	NP/-	-
15	FAAS	Surgical blade	NP/NP/<1.5	SWB/190	NP/-	-
16	ICP	Razor blade	NP/P/1.5	SWB/80	P/-	-
17	FAAS/ETAAS	-	NP/NP/1	SWB/100	NP/NP	-
18	ETAAS	Cutter knife	P/NP/1.19-1.38	WAS/400	NP/-	✓ Notes
19	ICP-MS/FAAS	Ceramic blade	NP/NP/0.5	SWB/400	NP/-	-
20	FAAS	Cutter knife	NP/NP/-	SWB/57	-/-	-
21	ICP	Stainless blade	NP/NP/1.0	SWB/75	NP	-
22	ICP	Cutter knife	NP/NP/1.45	Shaken incubator/30	NP	-
23	FAAS	Cutter knife	NP/P/>1.00<1.50	SWB/-	P/-	-
24	ICP-MS	Cutter knife	NP/NP/1	SWB/100	NP/-	-
25	FAAS	Cutter knife	NP/NP/<1.5	SWB/25	NP/NP	-
26	ICP/ICP-MS	Surgical blade	P/NP/1.27	Rotate/75	NP/-	✓ Notes
27	AAS	Glass sheet	NP/P/1.5	SWB/-	NP/-	-
28	FAAS/hydride generation	Scalpel blade	P/NP/1.3	SWB/100	NP/P	✓ Notes
29	ICP	Cutter	NP/NP/1.0	SWB/100	NP/NP	-
30	ICP-MS	Cutter knife	P/P/1.2	SWB/150	NP/-	-
31	FAAS	Razor blade	NP/NP/1.43	SWB/100	NP/-	-
32	-	-	-	-	-	-
33	FAAS	Razor blade	NP/NP/<2	SWB/150	NP/-	-
34	ICP/ ICP-MS	Scalpel blade	NP/NP/~1.2	SWB/-	NP/-	✓ Notes
35	FAAS	Scalpel blade	NP/P/1.0-1.5	Excentric shaker + isothermic box/120	NP/-	-
36	ICP	Surgical blade	-/NP/1.4	SWB/50	NP/-	-
37	-	-	-	-	-	-
38	FAAS/ETAAAS	Ceramic knife	-/NP/1.1	WAS/180-240	NP/-	-
39	Spectra 220FS Varian	Cutter knife	NP/P/1.3	Stirring magnetic/150	NP	✓ Notes
40	ICP	Razor blade	NP/NP/1.5	SWB/175	NP	✓ Notes
41	ICP	-	-	-	-	-
42	-	-	-	-	-	-

Table 4 Cont'd

Lab. no.	Analytical technique	Scraping tool	Comminution / pH adjustment / pH	Agitation means / Speed (rev. per min)	Centrifugation/ Solution stabilisation	Deviation, if any
43	ICP	scissors	NP/P/1.5	SWB/160	NP/-	-
44	Furnace/Flame AAS	Scalpel blade	P/NP/1	Vortexed for 1 min	NP/P	-
45	ICP/AAS	Scalpel blade	NP/NP/1.18	Laborshaker/110	NP/-	-
46	ICP	Blade	NP/NP/1.42	SWB/144	NP/NP	-
47	ICP	Blade	NP/NP/1.3	SWB/90	P/NP	-
48	ICP	Razor blade	NP/NP/1.3	WAS/-	NP/-	-
49	ICP/FAAS	Razor blade	-/P/1.5	SWB/-	NP/-	-
50	ICP-MS	Scalpel	NP/NP/-	By hand/-	NP/NP	-
51	ICP	Razor blade	P/NP/1.0	SWB/140	NP/-	-
52	ICP	Razor Blade	P/NP/1.5	SWB/120	NP/-	-
53	ICP	Surgical blade	P/NP/1.3-1.4	SWB/-	NP/-	-
54	ICP	Surgical blade	P/NP/1.0	WAS/120	NP/-	-
55	ICP	Razor blade	P/NP/1.2	SWB/140	NP	-
56	ICP	Surgical blade	P/NP/1.3	SWB/100	NP/-	-
57	ICP-MS	Cutter knife	P/P/1.2	SWB/150	NP	-
58	ICP	Razor blade	P/NP/1.3	SWB/120	NP/-	-
59	ICP	Razor blade	P/NP/1.0-1.5	SWB/140	NP/-	-
60	ICP	Razor blade	P/NP/1.2	SWB/135	NP/-	-
61	ICP	Surgical blade	P/NP/1.3	SWB/170	NP/-	-
62	ICP	Razor blade	P/NP/1.3	SWB/140	NP/-	-
63	ICP	Razor blade	P/NP/1.0~1.5	SWB/140	NP/-	-
64	ICP	Razor Blade	P/NP/1.12 & 1.08	SWB/170	NP/-	-
65	FAAS	Cutter knife	P/NP/1.3	SWB/100	NP/-	-
67	AES ISP	Razor blade	P/NP/1.0	SWB/40	NP/-	-
69	ICP	Razor Blade	P/NP/1.2	SWB/120	NP/-	-
70	FAAS	Cutter knife	NP/NP/1.0	SWB/100	NP/-	-
72	FAAS	Razor Blade	P/NP/1.2	SWB/140	NP	-
74	FAAS	Blade	NP/NP/1.3	SWB/150	NP/NP	-
76	AAS880	Cutter knife	P/NP/-	SWB/100	NP/-	-

Abbreviations: NP = Not performed SWB = Shaking water bath M = Magnetic
P = Performed WAS = Wrist action shaker OM = Orbital mixer

Notes:

Lab. 18: Sieving not performed.

Lab. 26: Extraction carried out at 25 °C.

Lab. 28: KCl added to hydrochloric acid solution.

Lab. 34: The reported results are adjusted by subtracting the analytical correction listed in EN71-3.

Lab. 39: Extraction carried out at 21 °C.

Lab. 40: 0.45 um membrane filter not used and sieving not performed.

Table 5 Standard deviations – Metal solution

Unit: µg/ml

Lab. no.	Sb	Ba	Cd	Cr	Pb
1	0.0059	0.0045	0.0000	0.0006	0.0015
2	--	0.0038	0.0171**	0.0112	0.0416**
3	0.0211**	0.0600**	0.0085	0.0243**	0.0582**
4	0.0056	0.0025	0.0016	0.0010	0.0092
5	0.0525**	0.0000	0.0017	0.0208**	0.0104
6	0.0127	0.0831**	0.0091	0.0486**	0.0230
7	0.0058	0.0058	0.0000	0.0058	0.0058
8	0.0026	0.0029	0.0012	0.0080	0.0268
9	0.0000	0.0000	0.0000	0.0000	0.0058
10	0.0305**	0.0012	0.0072	0.0010	0.0015
11	--	--	--	--	--
12	0.0031	0.0038	0.0023	0.0026	0.0036
13	0.0133	0.0051	0.0015	0.0056	0.0067
14	0.0017	0.0025	0.0015	0.0015	0.0038
15	--	--	--	--	--
16	0.0100	0.0000	0.0000	0.0000	0.0577**
17	-/-	--	0.0012	0.0116	0.0350**
18	--	--	0.0020	0.0061	0.0099
19	0.0030	0.0078	0.0184**	0.0081	0.0066
20	0.0180	0.6298**	0.0577**	0.0006	0.1210**
21	0.0015	0.0061	0.0023	0.0031	0.0082
22	0.0053	0.0030	0.0007	0.0004	0.0018
23	0.2965	--	0.0057	--	0.0113
24	0.0023	0.0076	0.0050	0.0091	0.0163
25	--	--	0.0025	--	0.0111
26	0.0038	0.0050	0.0036	0.0035	0.0038
27	0.0075	0.0127	0.0055	0.0070	0.0251
28	0.0060	0.0136	0.0246**	0.0090	0.0968**
29	--	--	--	--	--
30	0.0045	0.0129	0.0038	0.0076	0.0100
31	--	--	0.0040	0.0058	0.0365**
32	--	--	--	--	--
33	--	--	0.0200**	0.0000	0.0000
34	0.0137	0.0085	0.0079	0.0037	0.0044
35	--	--	0.0035	0.0049	0.0076
36	0.0040	0.0020	0.0010	0.0015	0.0058
37	--	--	--	--	--
38	0.0105	0.0300**	0.0025	0.0185**	0.0132
39	--	--	0.0006	0.0029	0.0000
40	0.0050	0.0032	0.0021	0.0045	0.0075
41	0.0060	0.0087	0.0131**	0.0056	0.0065
42	--	--	--	--	--
43	0.0015	0.0106	0.0097	0.0044	0.0192
44	0.0058	0.0100	0.0200**	0.0000	0.0058
45^	0.0066	0.0098	0.0085	0.0105	0.0197

Notes:

- Symbol "--" denotes that the laboratory did not submit triplicate data.
- Symbol "-/-" denotes that the laboratory submitted two sets of triplicate data.
- Symbol "^" denotes that the laboratory results were received after submission deadline.
- Symbol "**" denotes that result is regarded as **statistical outlier** according to Cochran's test.

Table 5(cont.)

Standard deviations – Metal solution

Unit: µg/ml

Lab. no.	Sb	Ba	Cd	Cr	Pb
46	--	--	--	--	--
47	0.0040	0.0078	0.0006	0.0023	0.0066
48	0.0252**	0.0058	0.0058	0.0058	0.0058
49	0.0061	1.1702**	0.1976**	0.0000	1.5068**
50	--	--	--	--	--
51	0.0153	0.0153	0.0058	0.0058	0.0058
52	0.0006	0.0032	0.0020	0.0010	0.0047
53	0.0059	0.0080	0.0038	0.0030	0.0076
54	0.0086	0.0021	0.0010	0.0023	0.0023
55	0.0015	0.0015	0.0015	0.0010	0.0030
56	0.0031	0.0015	0.0020	0.0026	0.0087
57	0.0045	0.0129	0.0038	0.0076	0.0100
58	0.0015	0.0111	0.0055	0.0025	0.0091
59	0.0078	0.0015	0.0017	0.0046	0.0085
60	0.0068	0.0040	0.0015	0.0032	0.0146
61	0.0006	0.0053	0.0020	0.0055	0.0060
62	0.0025	0.0015	0.0017	0.0023	0.0032
63	0.0074	0.0081	0.0072	0.0085	0.0116
64	0.0006	0.0035	0.0000	0.0006	0.0050
65	0.0015	0.0100	0.0252**	0.0100	0.0306**
67	0.0064	0.0006	0.0021	0.0012	0.0017
69	0.0036	0.0021	0.0010	0.0006	0.0021
70	0.0577**	0.0000	1.5275**	1.5275**	1.000088
72	0.0021	0.0100	0.0000	0.0058	0.0058
74	--	--	--	--	--
76	1.1547**	0.0306**	0.0115**	0.0115	0.0400**

Notes:

- i. Symbol "--" denotes that the laboratory did not submit triplicate data.
- ii. Symbol "-/-" denotes that the laboratory submitted two sets of triplicate data.
- iii. Symbol "^" denotes that the laboratory results were received after submission deadline.
- iv. Symbol "**" denotes that result is regarded as **statistical outlier** according to Cochran's test.

Table 6 Standard deviations – Coated plate A

Unit: mg/kg

Lab. no.	Sb	Ba	Cd	Cr	Pb
1	4.509	6.429	104.403	37.072	569.766
2	0.000	2.884	6.582	4.310	3.981
3	7.211	17.214	55.896	7.767	18.009
4	1.933	4.840	56.205	11.947	136.815
5	3.175	3.000	6.658	2.566	2.255
6	2.309	57.873**	70.059	48.014**	461.547
7	0.058	0.115	0.058	0.115	0.000
8	0.681	0.643	10.536	2.309	1.155
9	--	--	--	--	0.764
10	2.404	11.597	25.951	7.778	190.212
11	--	--	--	--	--
12	1.000	1.528	62.450	3.512	37.859
13	1.528	5.568	15.275	5.859	64.291
14	9.713	6.028	73.385	16.166	154.546
15	--	--	--	--	--
16	2.646	15.275	34.641	10.408	23.812
17	-/-	9.292	72.111	8.083	365.285
18	--	--	1011.2**	240.74**	1464.7**
19	1.528	10.000	233.89**	13.051	580.777
20	8.505	5.568	8.660	4.163	130.293
21	6.245	9.292	115.902	44.602**	227.230
22	32.274**	57.486**	364.00**	69.189**	1138.9**
23	8.379	--	87.540	--	133.219
24	3.215	3.606	36.056	8.622	34.196
25	6.110	63.611**	34.020	6.028	100.585
26	2.303	6.240	87.134	6.983	71.445
27	18.100**	13.629	72.390	13.741	1039.6**
28	2.000	2.082	30.000	60.000**	221.133
29	--	--	--	--	--
30	6.028	11.015	80.208	18.148	215.174
31	10.429	0.577	5.686	4.041	0.000
32	--	--	--	--	--
33	6.691	--	1.610	10.345	61.105
34	0.303	2.074	3.915	2.054	27.987
35	--	--	65.200	22.008	305.433
36	2.309	1.732	13.892	2.082	1.732
37	--	--	--	--	--
38	10.504	13.614	20.000	9.452	5.859
39	--	--	4.536	0.408	3.256
40	1.997	2.610	15.822	10.504	194.251
41	--	--	--	--	--
42	--	--	--	--	--
43	24.542**	95.270**	314.36**	113.12**	463.664
44	3.384	11.966	45.738	2.970	105.083
45^	4.949	11.027	103.16	35.177	160.24

Notes:

- i. Symbol "--" denotes that the laboratory did not submit triplicate data.
- ii. Symbol "-/-" denotes that the laboratory submitted two sets of triplicate data.
- iii. Symbol "^" denotes that the laboratory results were received after submission deadline.
- iv. Symbol "**" denotes that result is regarded as **statistical outlier** according to Cochran's test.

Table 6(cont.)

Standard deviations – Coated plate A

Unit: mg/kg

Lab. no.	Sb	Ba	Cd	Cr	Pb
46	--	--	--	--	--
47	3.786	2.517	49.329	3.606	61.101
48	9.603	5.368	155.826	23.900	453.595
49	10.821	22.543	7.028	20.817	147.355
50	--	--	--	--	--
51	3.464	3.175	28.868	8.401	152.753
52	6.616	15.256	164.329	32.078	410.528
53	7.767	12.858	154.131	41.041**	79.699
54	5.508	10.970	70.238	16.523	186.100
55	5.292	5.686	26.458	6.429	257.358
56	5.533	4.689	44.354	5.848	154.491
57	4.000	9.018	50.000	14.572	156.312
58	2.517	18.193	64.291	32.146	472.582
59	4.163	9.165	66.583	10.786	197.315
60	9.238	19.140	351.33**	52.374**	1053.6**
61	4.041	1.000	90.738	6.658	80.829
62	4.933	2.887	23.094	6.351	51.316
63	5.132	15.588	47.057	4.583	77.106
64	13.868	27.221	483.36**	146.73**	793.73**
65	1.528	12.503	76.376	21.455	245.425
67	0.772	1.320	2.373	1.916	0.451
69	2.517	2.646	45.826	17.010	115.470
70	0.015	15.275	100.000	300.00**	100.000
72	14.012	18.148	245.83**	207.33**	265.769
74	--	--	--	--	--
76	0.000	7.234	25.000	0.577	258.215

Notes:

- i. Symbol "--" denotes that the laboratory did not submit triplicate data.
- ii. Symbol "-/-" denotes that the laboratory submitted two sets of triplicate data.
- iii. Symbol "^" denotes that the laboratory results were received after submission deadline.
- iv. Symbol "**" denotes that result is regarded as **statistical outlier** according to Cochran's test.

Table 7 Standard deviations – Coated plate B

Unit: mg/kg

Lab. no.	Sb	Ba	Cd	Cr	Pb
1	2.082	1.155	15.275	8.083	162.583
2	3.113	3.313	12.528	7.602	7.533
3	5.292	16.623	120.200	23.643	101.933
4	4.141	3.159	95.113	16.366	155.821
5	2.754	3.464	4.726	1.893	2.000
6	25.968**	13.650	79.349	38.004	431.528
7	0.000	0.153	0.000	0.058	0.100
8	1.732	1.000	0.577	9.539	1.000
9	--	--	--	--	24.168
10	6.152	21.213	24.324	2.475	70.004
11	--	--	--	--	--
12	3.215	5.859	135.277	19.502	350.00
13	1.732	23.288	60.828	9.292	76.376
14	8.888	4.583	135.593	20.298	186.202
15	--	--	--	--	--
16	3.786	7.638	35.473	38.837	18.520
17	-/-	8.000	36.056	14.154	394.25
18	--	--	60.277	102.04**	946.52**
19	11.358	15.620	517.01**	9.866	1160.9**
20	5.132	13.650	50.501	5.568	280.454
21	3.000	10.817	135.769	23.643	217.792
22	21.158**	12.273	42.712	41.050	314.118
23	1.167	--	33.588	--	38.891
24	2.309	7.234	80.208	12.662	90.266
25	3.512	7.506	23.861	1.528	80.579
26	2.444	2.850	66.570	9.855	42.518
27	1.973	8.945	105.589	32.266	246.435
28	10.263	3.606	10.000	61.101	63.509
29	--	--	--	--	--
30	4.509	11.504	60.277	17.616	205.994
31	12.342	4.726	9.074	24.947	109.368
32	--	--	--	--	--
33	0.000	--	90.995	3.461	130.031
34	0.340	2.802	2.101	3.411	22.747
35	--	--	198.567	39.509	201.871
36	0.850	2.646	7.506	2.646	1.000
37	--	--	--	--	--
38	3.215	11.150	20.000	9.165	8.021
39	--	--	1.166	0.125	0.000
40	0.987	2.427	13.229	7.705	163.009
41	--	--	--	--	--
42	--	--	--	--	--
43	35.796**	92.045**	344.52**	140.12**	1064.8**
44	8.551	20.881	208.716	46.927	346.122
45^	11.065	13.111	197.195	37.625	140.947

Notes:

- i. Symbol "--" denotes that the laboratory did not submit triplicate data.
- ii. Symbol "-/-" denotes that the laboratory submitted two sets of triplicate data.
- iii. Symbol "^" denotes that the laboratory results were received after submission deadline.
- iv. Symbol "**" denotes that result is regarded as **statistical outlier** according to Cochran's test.

Table 7(cont.)

Standard deviations – Coated plate B

Unit: mg/kg

Lab. no.	Sb	Ba	Cd	Cr	Pb
46	--	--	--	--	--
47	2.517	1.155	40.000	12.858	75.719
48	15.707	14.135	12.814	71.191	571.25**
49	9.686	19.241	165.200	39.745	213.630
50	--	--	--	--	--
51	1.732	8.401	25.000	19.315	0.000
52	4.590	7.607	93.072	33.531	515.008
53	5.657	1.414	24.042	1.414	233.345
54	14.189	6.028	90.185	38.657	240.069
55	4.041	7.767	56.862	2.646	15.275
56	3.899	5.256	27.779	13.002	118.340
57	10.066	10.408	119.304	20.744	165.227
58	7.638	4.726	70.946	11.547	251.661
59	5.508	13.317	92.916	21.633	158.745
60	19.975**	2.000	323.16**	49.238	998.06**
61	9.713	5.033	47.032	14.295	193.595
62	2.082	2.646	15.275	5.568	30.551
63	4.359	1.528	8.386	2.082	91.029
64	30.006**	34.385**	621.40**	189.28**	854.40**
65	3.055	14.978	83.865	26.858	170.392
67	1.263	0.290	0.511	1.506	0.766
69	1.000	2.000	45.092	5.774	152.753
70	0.006	26.458	208.167	40.415	5074.9**
72	11.930	18.717	167.730	60.871	208.167
74	--	--	--	--	--
76	0.000	19.698	87.797	10.017	49.329

Notes:

- i. Symbol "--" denotes that the laboratory did not submit triplicate data.
- ii. Symbol "-/-" denotes that the laboratory submitted two sets of triplicate data.
- iii. Symbol "^" denotes that the laboratory results were received after submission deadline.
- iv. Symbol "**" denotes that result is regarded as **statistical outlier** according to Cochran's test.

Table 8 Cell means – Metal solution

Unit: µg/ml

Lab. no.	Sb	Ba	Cd	Cr	Pb
1	0.197	0.502	0.246	0.296	0.437
2	--	0.186**	0.221 x x	0.291	0.323 x x
3	0.296 x x	0.493 x x	0.259	0.258 x x	0.493 x x
4	0.211	0.496	0.245	0.296	0.457
5	0.263 x x	0.250**	0.239	0.224 x x	0.369
6	0.169	0.755 x x	0.250	0.770 x x	0.548
7	1.493**	0.707**	0.320**	0.253	0.397
8	0.205	0.448	0.232	0.296	0.541
9	0.210	0.490	0.260	0.290	0.467
10	0.297 x x	0.441	0.225	0.269	0.409
11	--	--	--	--	--
12	0.198	0.498	0.248	0.296	0.444
13	0.204	0.476	0.240	0.289	0.427
14	0.208	0.493	0.244	0.297	0.465
15	--	--	--	--	--
16	0.170	0.200**	0.250	0.250	0.933 x x
17	-/-	--	0.258	0.296	0.447 x x
18	--	--	0.043**	0.324	0.488
19	0.218	0.526	0.244 x x	0.382**	0.447
20	-0.009**	-0.793 x x	0.283 x x	0.019**	0.893 x x
21	0.208	0.469	0.236	0.271	0.428
22	0.338**	0.435	0.247	0.292	0.454
23	--	--	--	--	--
24	0.207	0.509	0.255	0.375**	0.448
25	--	--	0.222	--	0.547
26	0.205	0.507	0.269	0.309	0.474
27	0.230	0.525	0.286	0.324	0.564
28	0.030**	0.203**	0.288 x x	0.294	0.624 x x
29	--	--	--	--	--
30	0.195	0.464	0.242	0.319	0.425
31	--	--	0.279	0.299	0.549 x x
32	--	--	--	--	--
33	--	--	0.430 x x	0.260	0.260**
34	0.225	0.494	0.246	0.291	0.443
35	--	--	0.250	0.252	0.442
36	0.192	0.494	0.256	0.253	0.473
37	--	--	--	--	--
38	0.209	0.505 x x	0.245	0.313 x x	0.451
39	--	--	0.255	0.394**	0.480
40	0.310**	0.479	0.283	0.296	0.562
41	0.243	0.447	0.239 x x	0.277	0.432
42	--	--	--	--	--
43	0.214	0.480	0.210	0.280	0.463
44	0.233	0.420	1.640 x x	0.280	0.467
45^	0.193	0.515	0.214	0.313	0.414

Notes:

- Symbol "--" denotes that laboratory did not submit triplicate data.
- Symbol "-/-" denotes that the laboratory submitted two sets of triplicate data.
- Symbol "^" denotes that the laboratory results were received after submission deadline.
- Symbol "x x" denotes that result is regarded as **statistical outlier** according to Cochran's test.
- Symbol "**" denotes that result is regarded as **statistical outlier** according to Grubb's test.
- Symbol "*" denotes that result is regarded as **statistical straggler** according to Grubb's test.

Table 8(cont.)

Cell means – Metal solution

Unit: µg/ml

Lab. no.	Sb	Ba	Cd	Cr	Pb
46	--	--	--	--	--
47	0.235	0.455	0.189*	0.286	0.386
48	0.397**	0.483	0.247	0.287	0.427
49	0.078**	5.337**	0.213**	0**	1.643**
50	--	--	--	--	--
51	0.207	0.427	0.253	0.307	0.523
52	0.211	0.535	0.269	0.267	0.473
53	0.178	0.416	0.227	0.295	0.463
54	0.216	0.493	0.250	0.279	0.435
55	0.219	0.499	0.258	0.290	0.466
56	0.288**	0.492	0.247	0.293	0.498
57	0.195	0.464	0.242	0.319	0.425
58	0.201	0.514	0.241	0.294	0.468
59	0.228	0.494	0.247	0.296	0.450
60	0.208	0.467	0.243	0.303	0.408
61	0.212	0.485	0.238	0.290	0.432
62	0.212	0.512	0.255	0.306	0.463
63	0.219	0.496	0.243	0.301	0.459
64	0.191	0.488	0.250	0.297	0.444
65	0.031**	0.090**	0.277**	0.290	0.343**
67	0.193	0.505	0.266	0.298	0.510
69	0.205	0.499	0.233	0.309	0.417
70	0.077**	0**	26.3**	21.3**	39.0**
72	0.203	0.450	0.270	0.303	0.483
74	--	--	--	--	--
76	25.3**	0.207**	0.207**	0.273	0.480**

Notes:

- i. Symbol "--" denotes that laboratory did not submit triplicate data.
- ii. Symbol "-/-" denotes that the laboratory submitted two sets of triplicate data.
- iii. Symbol "^" denotes that the laboratory results were received after submission deadline.
- iv. Symbol "**" denotes that result is regarded as **statistical outlier** according to Cochran's test.
- v. Symbol "***" denotes that result is regarded as **statistical outlier** according to Grubb's test.
- vi. Symbol "*" denotes that result is regarded as **statistical straggler** according to Grubb's test.

Table 9 Cell means – Coated plate A

Unit: mg/kg

Lab. no.	Sb	Ba	Cd	Cr	Pb
1	165	263	2370	578	6997
2	122	315	598	516	200
3	176	255	1975	489	6423
4	197	297	2667	717	8622
5	163	303	1159	460	484
6	218	465✖✖	2165	578✖✖	3863
7	175	461*	1808	645	2542
8	134	177	1143	557	426
9	--	--	--	--	24.7
10	--	--	--	--	--
11	--	--	--	--	--
12	178	298	2260	585	7317
13	161	306	2017	543	7037
14	223	340	2940	790	9257
15	--	--	--	--	--
16	111	227	1465	428	846
17	-/-	286	2010	531	3477
18	--	--	3397✖✖	472✖✖	9117✖✖
19	246	361	4105✖✖	1054	10584
20	160	549*	583	525	14673
21	168	600**	2887	679✖✖	6687
22	337✖✖	693✖✖	2472✖✖	632✖✖	4736✖✖
23	--	--	--	--	--
24	102	292	1240	452	480
25	168	545✖✖	1817	384	6734
26	105	228	1940	599	1575
27	173✖✖	259	2875	615	10644✖✖
28	68	278	2560	650✖✖	8190
29	--	--	--	--	--
30	162	295	2087	534	6930
31	100	262	1368	552	4516
32	--	--	--	--	--
33	292	--	5597*	442	5277
34	16	115	327	80	889
35	--	--	1922	478	3935
36	127	251	1173	553	605
37	--	--	--	--	--
38	149	455	1480	483	336
39	--	--	533	135	1054
40	205	222	4580*	1076	13407
41	--	--	--	--	--
42	--	--	--	--	--
43	189✖✖	732✖✖	2054✖✖	566✖✖	3670
44	81.8	385	2142	386	4442
45^	176.8	286.0	2322.9	626.7	3816.5

Notes:

- Symbol "--" denotes that laboratory did not submit triplicate data.
- Symbol "-/-" denotes that the laboratory submitted two sets of triplicate data.
- Symbol "^" denotes that the laboratory results were received after submission deadline.
- Symbol "✖✖" denotes that result is regarded as **statistical outlier** according to Cochran's test.
- Symbol "**" denotes that result is regarded as **statistical outlier** according to Grubb's test.
- Symbol "*" denotes that result is regarded as **statistical straggler** according to Grubb's test.

Table 9(cont.)

Cell means – Coated plate A

Unit: mg/kg

Lab. no.	Sb	Ba	Cd	Cr	Pb
46	--	--	--	--	--
47	169	258	1963	629	3483
48	295	409	3987	997	11272
49	262	403	3892	955	11180
50	--	--	--	--	--
51	224	312	2708	887	10633
52	38	108	629	136	2057
53	152	253	1932	617* ^x	7592
54	158	268	1863	460	5867
55	224	316	3210	860	10003
56	150	264	2310	580	6113
57	131	277	1600	395	4753
58	236	368	3577	1073	11267
59	187	331	2673	729	8893
60	210	377	3553* ^x	904* ^x	11400* ^x
61	196	313	2477	740	9913
62	198	273	2957	775	9947
63	181	320	2662	623	7623
64	157	313	3477* ^x	970* ^x	11200* ^x
65	39	598**	2133	675	7227
67	211	290	1043	1333	225
69	220	325	3520	901	11133
70	0.267	763**	3400	7500* ^x	10200
72	233	333	3017* ^x	1055* ^x	9197
74	--	--	--	--	--
76	12	226	1350	532	3685

Notes:

- i. Symbol "--" denotes that laboratory did not submit triplicate data.
- ii. Symbol "-/-" denotes that the laboratory submitted two sets of triplicate data.
- iii. Symbol "^" denotes that the laboratory results were received after submission deadline.
- iv. Symbol "*^x" denotes that result is regarded as **statistical outlier** according to Cochran's test.
- v. Symbol "**" denotes that result is regarded as **statistical outlier** according to Grubb's test.
- vi. Symbol "*^y" denotes that result is regarded as **statistical straggler** according to Grubb's test.

Table 10 Cell means – Coated plate B

Unit: mg/kg

Lab. no.	Sb	Ba	Cd	Cr	Pb
1	125	246	1867	455	5483
2	152	290	1332	516	749
3	190	257	2143	500	6575
4	234	325	3360	912	10979
5	151	295	666	400	215
6	244**	465	2367	449	5069
7	183	435	1932	721	3624
8	139	148	560	648	182
9	--	--	--	--	42.2
10	--	--	--	--	--
11	--	--	--	--	--
12	176	289	2480	631	7830
13	149	279	1830	504	6533
14	211	338	3146	787	9119
15	306	272	1872	570	2638
16	111	242	1332	433	787
17	-/-	276	2050	533	2133
18	--	--	1917	516**	6740**
19	231	338	3181**	940	4521**
20	137	498	5290	547	11839
21	170	587	2663	607	6773
22	332**	683*	2494	630	4523
23	--	--	--	--	--
24	101	283	1463	404	897
25	155	560	1773	360	6392
26	107	237	1850	670	1373
27	133	217	2462	534	8725
28	31.3	250	2060	513	7137
29	--	--	--	--	--
30	164	298	2223	564	7857
31	115	243	998	461	2815
32	--	--	--	--	--
33	300	--	4648	442	5754
34	18.2	130	361	91	939
35	--	--	1965	470	3756
36	98.5	270	655	475	223
37	--	--	--	--	--
38	165	547	2410	558	618
39	--	--	370	124	817
40	197	227	3832	947	10158
41	--	--	--	--	--
42	--	--	--	--	--
43	194**	624**	1985**	565**	3180**
44	97.1	446	2769	500	5418
45^	178	301	2483	679	2821

Notes:

- Symbol "--" denotes that laboratory did not submit triplicate data.
- Symbol "-/-" denotes that the laboratory submitted two sets of triplicate data.
- Symbol "^" denotes that the laboratory results were received after submission deadline.
- Symbol "**" denotes that result is regarded as **statistical outlier** according to Cochran's test.
- Symbol "***" denotes that result is regarded as **statistical outlier** according to Grubb's test.
- Symbol "*" denotes that result is regarded as **statistical straggler** according to Grubb's test.

Table 10(cont.)

Cell means – Coated plate B

Unit: mg/kg

Lab. no.	Sb	Ba	Cd	Cr	Pb
46	--	--	--	--	--
47	161	245	2120	647	4687
48	271	389	3625	949	10394**
49	267	454	3435	909	9918
50	--	--	--	--	--
51	134	405	1350	526	4600
52	34.1	96.8	675	150	2327
53	--	--	--	--	--
54	165	281	1887	484	5923
55	230	321	2943	812	9507
56	140	254	2030	514	5754
57	213	340	3003	789	8730
58	267	362	3927	1157	11167
59	208	339	3253	854	9510
60	216**	387	3277**	865	11027**
61	172	286	2272	592	7579
62	209	350	3247	839	9673
63	187	316	2330	607	6735
64	158**	307**	3597**	1009**	12000**
65	35.3	606	2247	649	7613
67	190	330	1399	1271	1189
69	235	327	4127	1067	12867
70	0.267	720*	3233	687	3940**
72	258	330	3277	920	10333
74	--	--	--	--	--
76	11	209	1342	643	4388

Notes:

- Symbol "--" denotes that laboratory did not submit triplicate data.
- Symbol "-/-" denotes that the laboratory submitted two sets of triplicate data.
- Symbol "^" denotes that the laboratory results were received after submission deadline.
- Symbol "**" denotes that result is regarded as **statistical outlier** according to Cochran's test.
- Symbol "***" denotes that result is regarded as **statistical outlier** according to Grubb's test.
- Symbol "*" denotes that result is regarded as **statistical straggler** according to Grubb's test.

Computed values of general mean, repeatability standard deviation and reproducibility standard deviation

	Element	General mean (m)	Repeatability standard deviation (S_r)	%CV _r	Reproducibility standard deviation (S_R)	%CV _R
Metal solution	Sb	0.207	0.0065	3.2	0.0170	8.2
	Ba	0.482	0.0069	1.4	0.030	6.2
	Cd	0.248	0.0039	1.6	0.0175	7.1
	Cr	0.290	0.0053	1.8	0.0182	6.3
	Pb	0.460	0.0099	2.2	0.0441	9.6
		Unit: µg/ml				
Coated plate A	Sb	167	6.07	3.6	65.1	39
	Ba	309	10.8	3.5	76.7	25
	Cd	2265	65.9	2.9	1045	46
	Cr	633	14.1	2.2	228	36
	Pb	6058	232	3.8	3805	63
		Unit: mg/kg				
Coated plate B	Sb	165	6.26	3.8	68.7	42
	Ba	352	11.1	3.2	131	37
	Cd	2361	90.7	3.8	1050	44
	Cr	644	26.4	4.1	223	35
	Pb	5797	184	3.2	3601	62
		Unit: mg/kg				

Table 11 z-scores – Metal solution

Lab. no.	Sb	Ba	Cd	Cr	Pb
1	-0.6	0.7	-0.1	0.3	-0.5
2	-	-9.9**	-1.5**	0.1	-3.1**
3	5.2**	0.4**	0.6	-1.8**	0.8**
4	0.2	0.5	-0.2	0.3	-0.1
5	3.2**	-7.8**	-0.5	-3.6**	-2.1
6	-2.3	9.2**	0.1	26**	2.0
7	76**	7.5**	4.1**	-2.0	-1.4
8	-0.1	-1.1	-0.9	0.3	1.8
9	0.1	0.3	0.7	0.0	0.2
10	5.3**	-1.4	-1.3	-1.2	-1.1
11	-	-	-	-	-
12	-0.5	0.6	0.0	0.3	-0.4
13	-0.2	-0.2	-0.4	-0.1	-0.7
14	0.0	0.4	-0.2	0.3	0.1
15	-	-	-	-	-
16	-2.2	-9.4**	0.1	-2.2	11**
17	-/-	-	0.6	0.3	-0.3**
18#	-	-	-12**	1.8	0.6
19	0.6	1.5	-0.2**	5.0**	-0.3
20	-13**	-43**	2.0**	-15**	9.8**
21	0.1	-0.4	-0.7	-1.0	-0.7
22	7.7**	-1.6	0.0	0.1	-0.1
23	-	-	-	-	-
24	0.0	0.9	0.4	4.6**	-0.3
25	-	-	-1.5	-	2.0
26#	-0.2	0.8	1.2	1.0	0.3
27	1.3	1.5	2.2	1.8	2.4
28#	-10**	-9.4**	2.3**	0.2	3.7**
29	-	-	-	-	-
30	-0.8	-0.6	-0.3	1.6	-0.8
31	-	-	1.8	0.5	2.0**
32	-	-	-	-	-
33	-	-	10**	-1.7	-4.5**
34#	1.0	0.4	-0.1	0.0	-0.4
35	--	--	0.1	-2.1	-0.4
36	-0.9	0.4	0.5	-2.1	0.3
37	-	-	-	-	-
38	0.1	0.8**	-0.2	1.2**	-0.2
39#	-	-	0.4	5.7**	0.5
40#	6.1**	-0.1	2.0	0.3	2.3
41	2.1	-1.2	-0.5	-0.7	-0.6
42	-	-	-	-	-
43	0.4	0.0	-2.1	-0.6	0.1
44	1.5	-2.1	80**	-0.6	0.2
45^	-0.9	1.1	-1.9	1.2	-1.1

Notes:

- Symbol “-” denotes that laboratory did not submit triplicate data.
- Symbol “-/-” denotes that the laboratory submitted two sets of triplicate data.
- Symbol “^” denotes that the laboratory results were received after submission deadline.
- Symbol “**” denotes that result is regarded as **statistical outlier** according to Cochran’s test or Grubb’s test.
- Symbol “*” denotes that result is regarded as **statistical straggler** according to Grubb’s test.
- Symbol “#” denotes that the laboratory results were obtained with procedures deviated from EN71-3:1994.

Table 11(cont.)

 $\bar{x}$ -scores – Metal solution

Lab. no.	Sb	Ba	Cd	Cr	Pb
46	-	-	-	-	-
47	1.6	-0.9	-3.3*	-0.2	-1.7
48	11**	0.1	-0.1	-0.2	-0.8
49	-7.6**	163**	-2.0**	-16**	27**
50	-	-	-	-	-
51	0.0	-1.8	0.3	0.9	1.4
52	0.2	1.8	1.2	-1.3	0.3
53	-1.7	-2.2	-1.2	0.3	0.1
54	0.5	0.4	0.1	-0.6	-0.6
55	0.7	0.6	0.6	0.0	0.1
56	4.8**	0.3	0.0	0.1	0.9
57	-0.8	-0.6	-0.3	1.6	-0.8
58	-0.4	1.1	-0.4	0.2	0.2
59	1.2	0.4	0.0	0.3	-0.2
60	0.0	-0.5	-0.3	0.7	-1.2
61	0.2	0.1	-0.6	0.0	-0.6
62	0.3	1.0	0.4	0.9	0.1
63	0.7	0.5	-0.3	0.6	0.0
64	-1.0	0.2	0.1	0.4	-0.4
65	-10**	-13**	1.7**	0.0	-2.6**
67	-0.9	0.8	1.1	0.4	1.1
69	-0.1	0.6	-0.8	1.0	-1.0
70	-7.7**	-16**	1490**	1154**	873**
72	-0.3	-1.1	1.3	0.7	0.5
74	-	-	-	-	-
76	1478**	-9.2**	-2.3**	-0.9	0.5**

Notes:

- i. Symbol “-“ denotes that laboratory did not submit triplicate data.
- ii. Symbol “-/-“ denotes that the laboratory submitted two sets of triplicate data.
- iii. Symbol “^>” denotes that the laboratory results were received after submission deadline.
- iv. Symbol “**” denotes that result is regarded as **statistical outlier** according to Cochran’s test or Grubb’s test.
- v. Symbol “*?” denotes that result is regarded as **statistical straggler** according to Grubb’s test.
- vi. Symbol “#” denotes that the laboratory results were obtained with procedures deviated from EN71-3:1994.

Table 12 z-scores – Coated plate A

Lab. no.	Sb	Ba	Cd	Cr	Pb
1	0.0	-0.6	0.1	-0.2	0.2
2	-0.7	0.1	-1.6	-0.5	-1.5
3	0.1	-0.7	-0.3	-0.6	0.1
4	0.5	-0.2	0.4	0.4	0.7
5	-0.1	-0.1	-1.1	-0.8	-1.5
6	0.8	2.0**	-0.1	-0.2**	-0.6
7	0.1	2.0	-0.4	0.1	-0.9
8	-0.5	-1.7*	-1.1	-0.3	-1.5
9	-	-	-	-	-1.6
10	-	-	-	-	-
11	-	-	-	-	-
12	0.2	-0.1	0.0	-0.2	0.3
13	-0.1	0.0	-0.2	-0.4	0.3
14	0.9	0.4	0.6	0.7	0.8
15	-	-	-	-	-
16	-0.9	-1.1	-0.8	-0.9	-1.4
17	-/-	-0.3	-0.2	-0.4	-0.7
18#	-	-	1.1**	-0.7**	0.8**
19	1.2	0.7	1.8**	1.9	1.2
20	-0.1	3.1	-1.6*	-0.5	2.3
21	0.0	3.8**	0.6	0.2**	0.2
22	2.6**	5.0**	0.2**	0.0**	-0.3**
23	-	-	-	-	-
24	-1.0	-0.2	-1.0	-0.8	-1.5
25	0.0	3.1**	-0.4	-1.1	0.2
26#	-1.0	-1.0	-0.3	-0.1	-1.2
27	0.1**	-0.6	0.6	-0.1	1.2**
28#	-1.5	-0.4	0.3	0.1**	0.6
29	-	-	-	-	-
30	-0.1	-0.2	-0.2	-0.4	0.2
31	-1.0	-0.6	-0.9	-0.4	-0.4
32	-	-	-	-	-
33	1.9	-	3.2*	-0.8	-0.2
34#	-2.3	-2.5	-1.9	-2.4	-1.4
35	-	-	-0.3	-0.7	-0.6
36	-0.6	-0.8	-1.0	-0.4	-1.4
37	-	-	-	-	-
38	-0.3	1.9	-0.8	-0.7	-1.5
39#	-	-	-1.7	-2.2	-1.3
40#	0.6	-1.1	2.2*	1.9	1.9
41	-	-	-	-	-
42	-	-	-	-	-
43	0.3**	5.5**	-0.2**	-0.3**	-0.6
44	-1.3	1.0	-0.1	-1.1	-0.4
45^	0.2	-0.3	0.1	0.0	-0.6

Notes:

- Symbol “-“ denotes that laboratory did not submit triplicate data.
- Symbol “-/-“ denotes that the laboratory submitted two sets of triplicate data.
- Symbol “^” denotes that the laboratory results were received after submission deadline.
- Symbol “**” denotes that result is regarded as **statistical outlier** according to Cochran’s test or Grubb’s test.
- Symbol “*” denotes that result is regarded as **statistical straggler** according to Grubb’s test.
- Symbol “#” denotes that the laboratory results were obtained with procedures deviated from EN71-3:1994.

Table 12(cont.)

 $\bar{x}$ -scores – Coated plate A

Lab. no.	Sb	Ba	Cd	Cr	Pb
46	-	-	-	-	-
47	0.0	-0.7	-0.3	0.0	-0.7
48	2.0	1.3	1.6	1.6	1.4
49	1.5	1.2	1.6	1.4	1.3
50	-	-	-	-	-
51	0.9	0.0	0.4	1.1	1.2
52	-2.0	-2.6	-1.6	-2.2	-1.1
53	-0.2	-0.7	-0.3	-0.1**	0.4
54	-0.1	-0.5	-0.4	-0.8	-0.1
55	0.9	0.1	0.9	1.0	1.0
56	-0.2	-0.6	0.0	-0.2	0.0
57	-0.5	-0.4	-0.6	-1.0	-0.3
58	1.1	0.8	1.3	1.9	1.4
59	0.3	0.3	0.4	0.4	0.7
60	0.7	0.9	1.2**	1.2**	1.4**
61	0.5	0.1	0.2	0.5	1.0
62	0.5	-0.5	0.7	0.6	1.0
63	0.2	0.1	0.4	0.0	0.4
64	-0.1	0.1	1.2**	1.5**	1.4**
65	-2.0	3.8**	-0.1	0.2	0.3
67	0.7	-0.2	-1.2	3.1	-1.5
69	0.8	0.2	1.2	1.2	1.3
70	-2.6	5.9**	1.1	30**	1.1
72	1.0	0.3	0.7**	1.9**	0.8
74	-	-	-	-	-
76	-2.4	-1.1	-0.9	-0.4	-0.6

Notes:

- i. Symbol “-” denotes that laboratory did not submit triplicate data.
- ii. Symbol “-/-” denotes that the laboratory submitted two sets of triplicate data.
- iii. Symbol “^>” denotes that the laboratory results were received after submission deadline.
- iv. Symbol “**” denotes that result is regarded as **statistical outlier** according to Cochran’s test or Grubb’s test.
- v. Symbol “*?” denotes that result is regarded as **statistical straggler** according to Grubb’s test.
- vi. Symbol “#” denotes that the laboratory results were obtained with procedures deviated from EN71-3:1994.

Table 13 z-scores – Coated plate B

Lab. no.	Sb	Ba	Cd	Cr	Pb
1	-0.6	-0.8	-0.5	-0.8	-0.1
2	-0.2	-0.5	-1.0	-0.6	-1.4
3	0.4	-0.7	-0.2	-0.6	0.2
4	1.0	-0.2	1.0	1.2	1.4
5	-0.2	-0.4	-1.6	-1.1	-1.6
6	1.2**	0.9	0.0	-0.9	-0.2
7	0.3	0.6	-0.4	0.3	-0.6
8	-0.4	-1.6	-1.7	0.0	-1.6
9	-	-	-	-	-1.6
10	-	-	-	-	-
11	-	-	-	-	-
12	0.2	-0.5	0.1	-0.1	0.6
13	-0.2	-0.6	-0.5	-0.6	0.2
14	0.7	-0.1	0.7	0.6	0.9
15	-	-	-	-	-
16	-0.8	-0.8	-1.0	-0.9	-1.4
17	-/-	-0.6	-0.3	-0.5	-1.0
18#	-	-	-0.4	-0.6**	0.3**
19	1.0	-0.1	0.8**	1.3	-0.4**
20	-0.4	1.1	2.8	-0.4	1.7
21	0.1	1.8	0.3	-0.2	0.3
22	2.4**	2.5**	0.1	-0.1	-0.4
23	-	-	-	-	-
24	-0.9	-0.5	-0.9	-1.1	-1.4
25	-0.1	1.6	-0.6	-1.3	0.2
26#	-0.8	-0.9	-0.5	0.1	-1.2
27	-0.5	-1.0	0.1	-0.5	0.8
28#	-1.9	-0.8	-0.3	-0.6	0.4
29	-	-	-	-	-
30	0.0	-0.4	-0.1	-0.4	0.6
31	-0.7	-0.8	-1.3	-0.8	-0.8
32	-	-	-	-	-
33	2.0	-	2.2	-0.9	0.0
34#	-2.1	-1.7	-1.9	-2.5	-1.3
35	-	-	-0.4	-0.8	-0.6
36	-1.0	-0.6	-1.6	-0.8	-1.5
37	-	-	-	-	-
38	0.0	1.5	0.0	-0.4	-1.4
39#	-	-	-1.9	-2.3	-1.4
40#	0.5	-1.0	1.4	1.4	1.2
41	-	-	-	-	-
42	-	-	-	-	-
43	0.4**	2.1**	-0.4**	-0.4**	-0.7**
44	-1.0	0.7	0.4	-0.6	-0.1
45^	0.2	-0.4	0.1	0.2	-0.8

Notes:

- Symbol “-” denotes that laboratory did not submit triplicate data.
- Symbol “-/-” denotes that the laboratory submitted two sets of triplicate data.
- Symbol “^” denotes that the laboratory results were received after submission deadline.
- Symbol “**” denotes that result is regarded as **statistical outlier** according to Cochran’s test or Grubb’s test.
- Symbol “*” denotes that result is regarded as **statistical straggler** according to Grubb’s test.
- Symbol “#” denotes that the laboratory results were obtained with procedures deviated from EN71-3:1994.

Table 13(cont.)

 $\bar{x}$ -scores – Coated plate B

Lab. no.	Sb	Ba	Cd	Cr	Pb
46	-	-	-	-	-
47	0.0	-0.8	-0.2	0.0	-0.3
48	1.6	0.3	1.2	1.4	1.3**
49	1.5	0.8	1.0	1.2	1.1
50	-	-	-	-	-
51	-0.4	0.4	-1.0	-0.5	-0.3
52	-1.9	-1.9	-1.6	-2.2	-1.0
53	-0.1	-0.7	0.1	0.0	0.6
54	0.0	-0.5	-0.5	-0.7	0.0
55	0.9	-0.2	0.6	0.8	1.0
56	-0.4	-0.8	-0.3	-0.6	0.0
57	0.7	-0.1	0.6	0.6	0.8
58	1.5	0.1	1.5	2.3	1.5
59	0.6	-0.1	0.8	0.9	1.0
60	0.7**	0.3	0.9**	1.0	1.5**
61	0.1	-0.5	-0.1	-0.2	0.5
62	0.7	0.0	0.8	0.9	1.1
63	0.3	-0.3	0.0	-0.2	0.3
64	-0.1**	-0.3**	1.2**	1.6**	1.7**
65	-1.9	1.9	-0.1	0.0	0.5
67	0.4	-0.2	-0.9	2.8	-1.3
69	1.0	-0.2	1.7	1.9	2.0
70	-2.4	2.8*	0.8	0.2	-0.5**
72	1.4	-0.2	0.9	1.2	1.3
74	-	-	-	-	-
76	-2.2	-1.1	-1.0	0.0	-0.4

Notes:

- i. Symbol “-” denotes that laboratory did not submit triplicate data.
- ii. Symbol “-/-” denotes that the laboratory submitted two sets of triplicate data.
- iii. Symbol “^” denotes that the laboratory results were received after submission deadline.
- iv. Symbol “**” denotes that result is regarded as **statistical outlier** according to Cochran’s test or Grubb’s test.
- v. Symbol “*” denotes that result is regarded as **statistical straggler** according to Grubb’s test.
- vi. Symbol “#” denotes that the laboratory results were obtained with procedures deviated from EN71-3:1994.

Figure 1 Mandel's between-laboratory consistency statistic, h
(Metal solution)

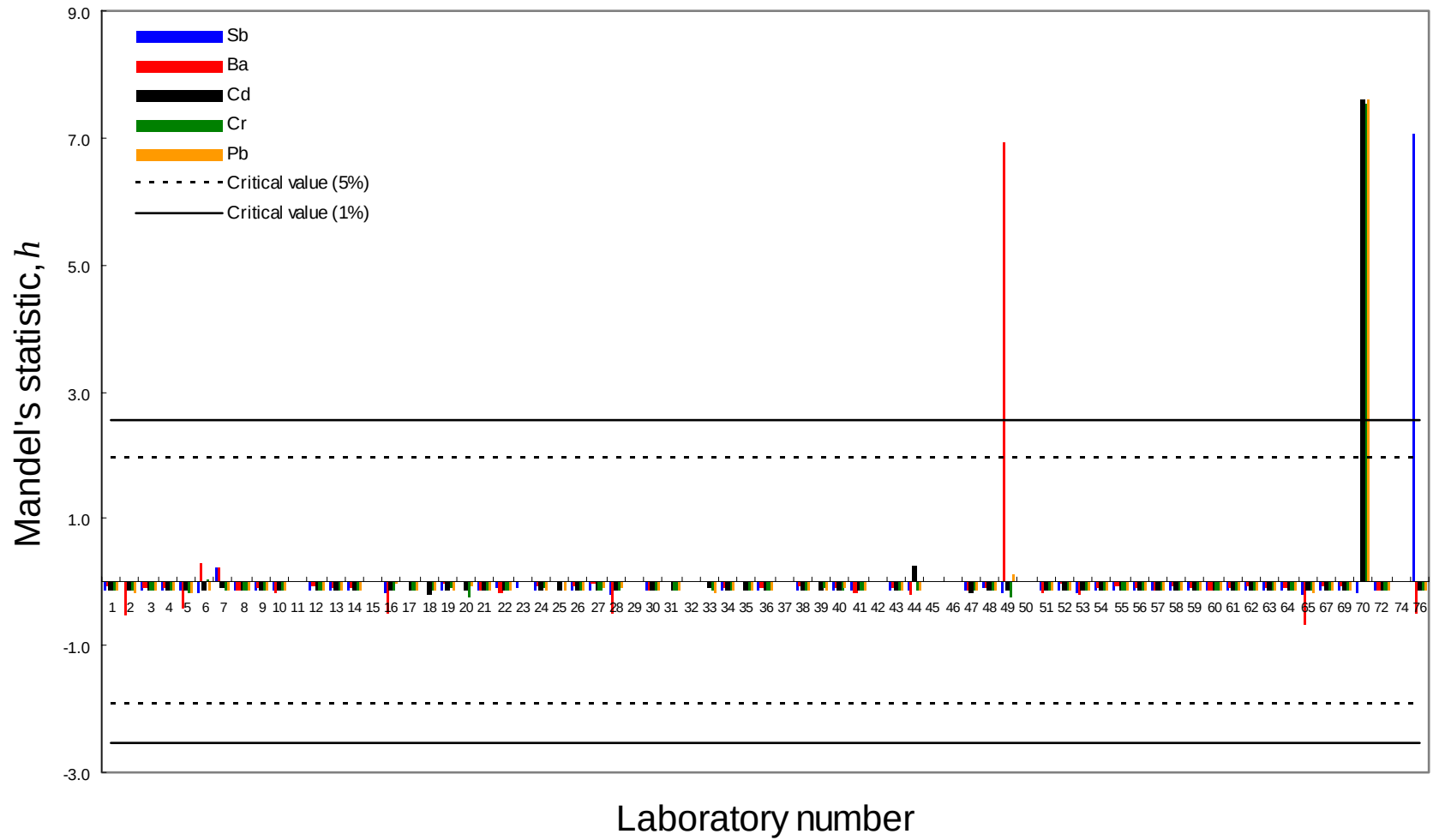


Figure 2 Mandel's between-laboratory consistency statistic, h
(Metal solution, extreme outlier rejected)

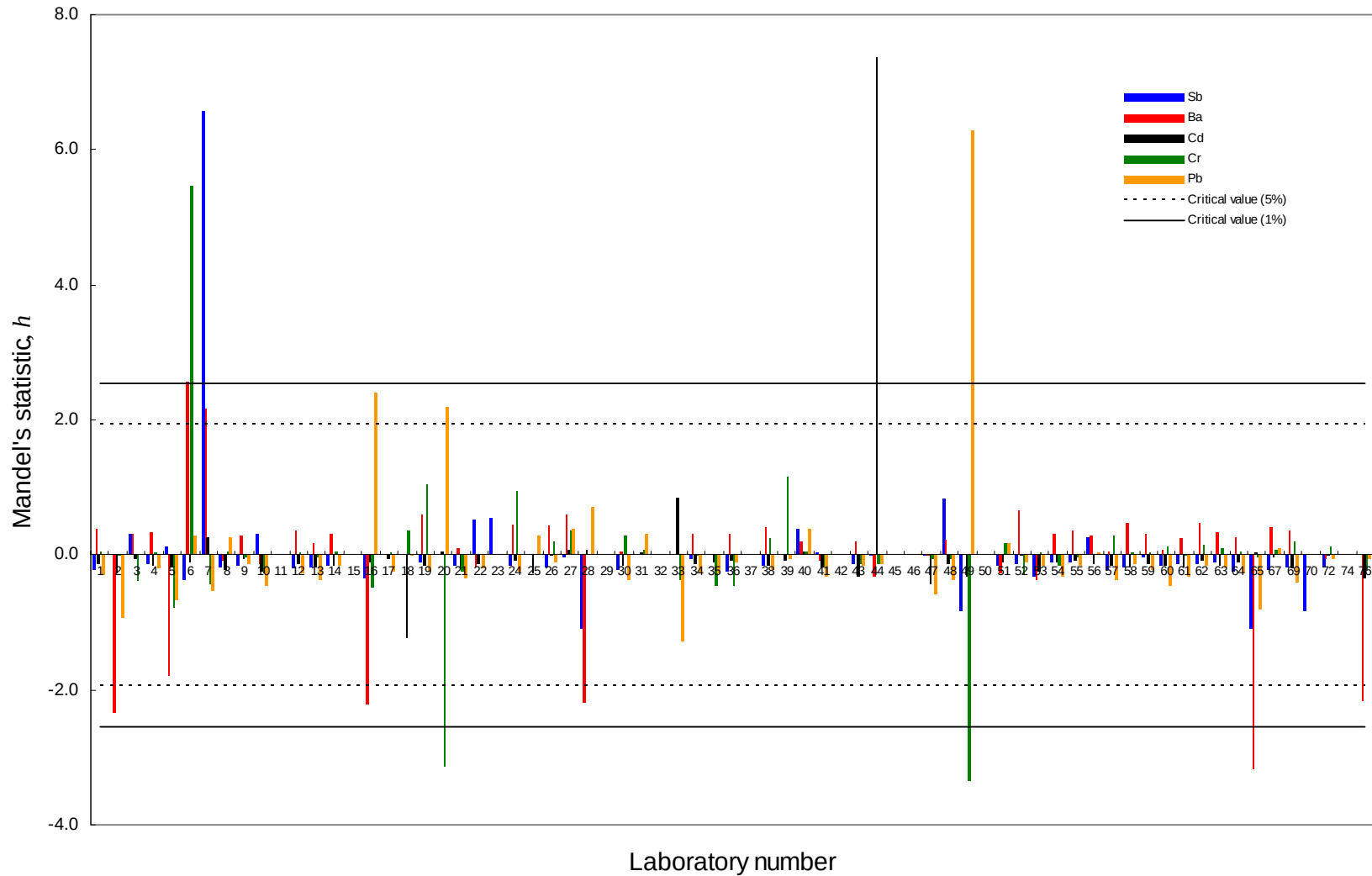


Figure 3 Mandel's between-laboratory consistency statistic, h
(Sample A)

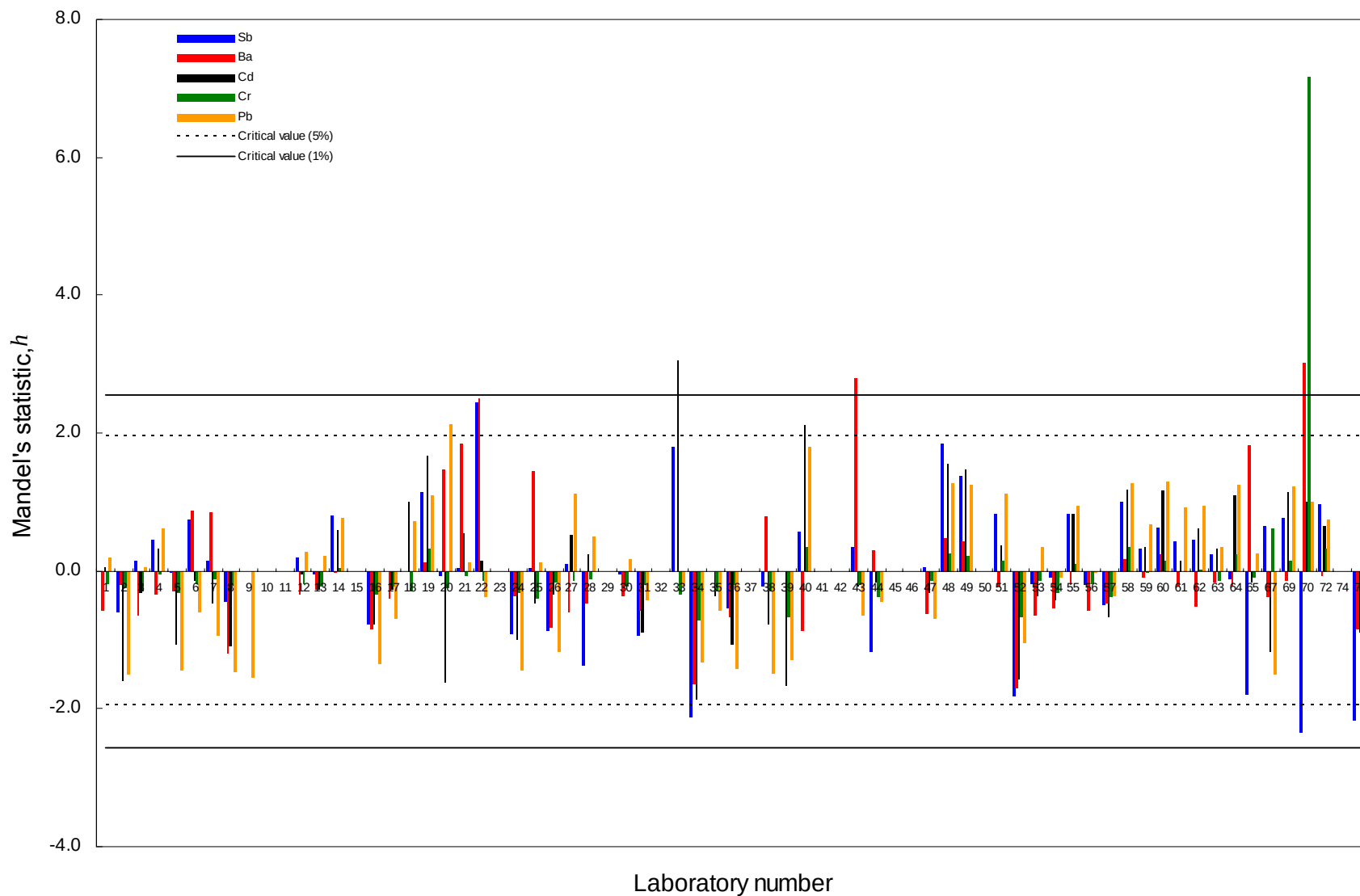


Figure 4 Mandel's between-laboratory consistency statistic, h
(Sample B)

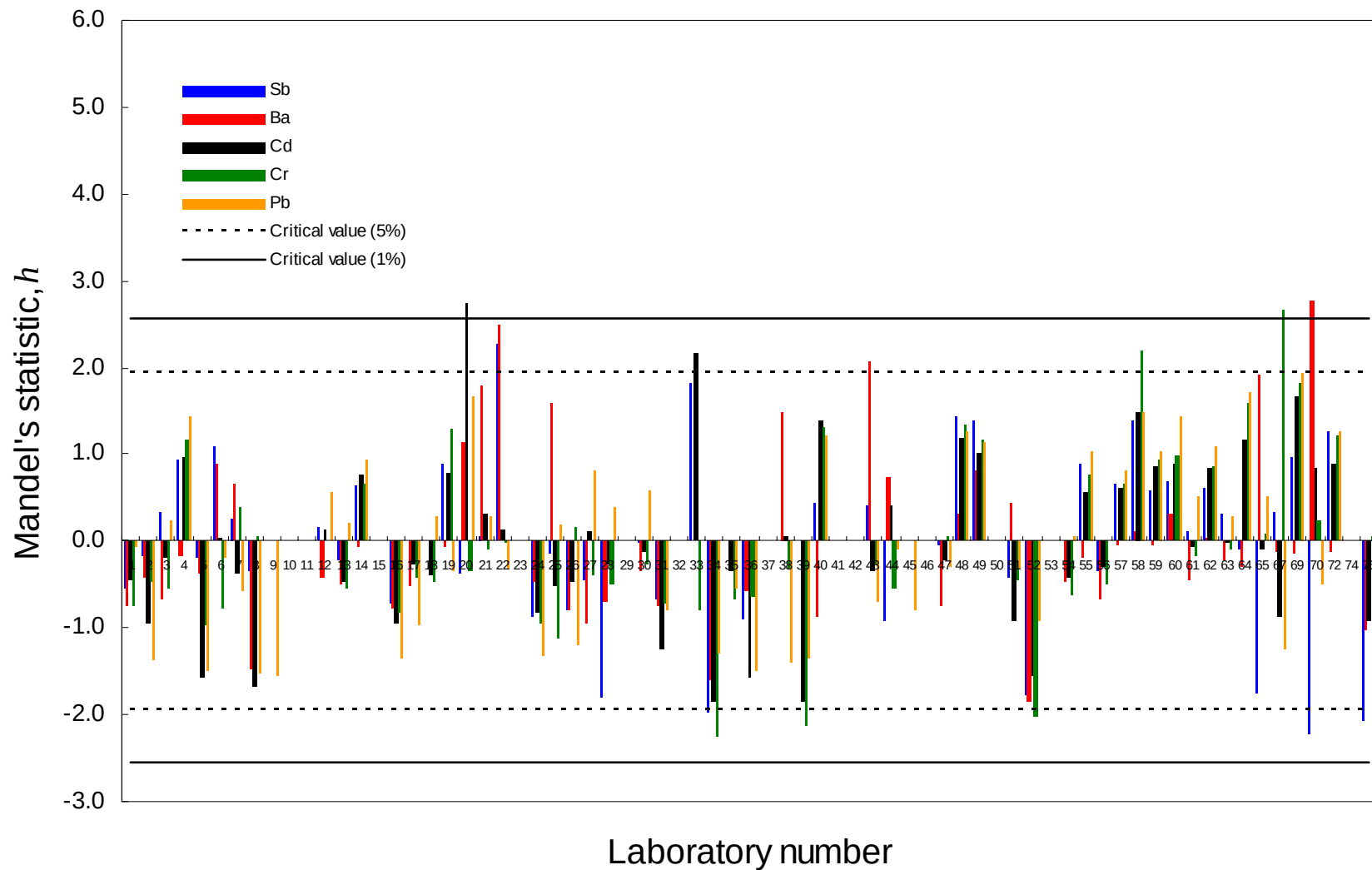


Figure 5 Mandel's within-laboratory consistency statistic, k
(Metal solution)

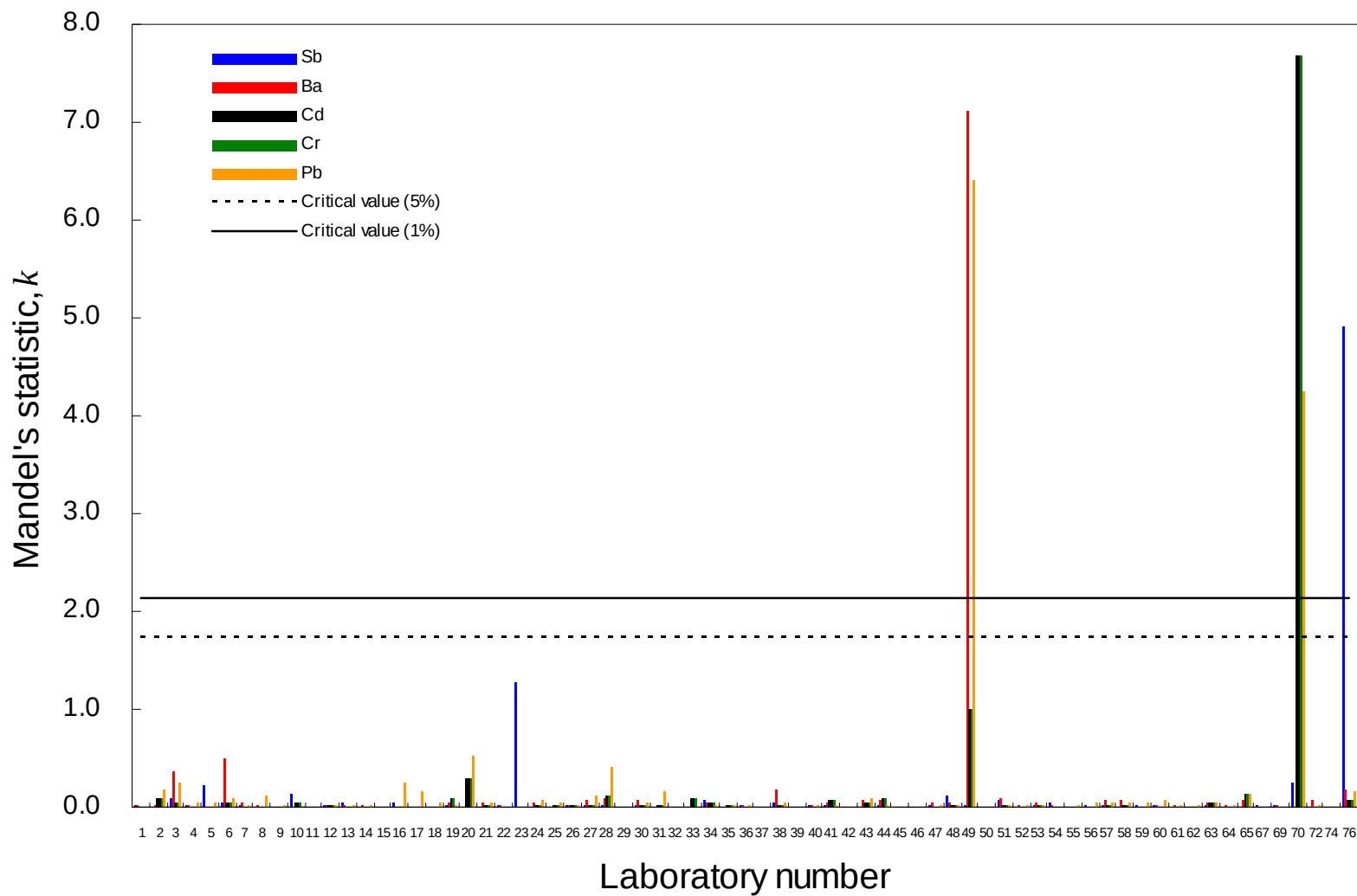


Figure 6 Mandel's within-laboratory consistency statistic, k
(Sample A)

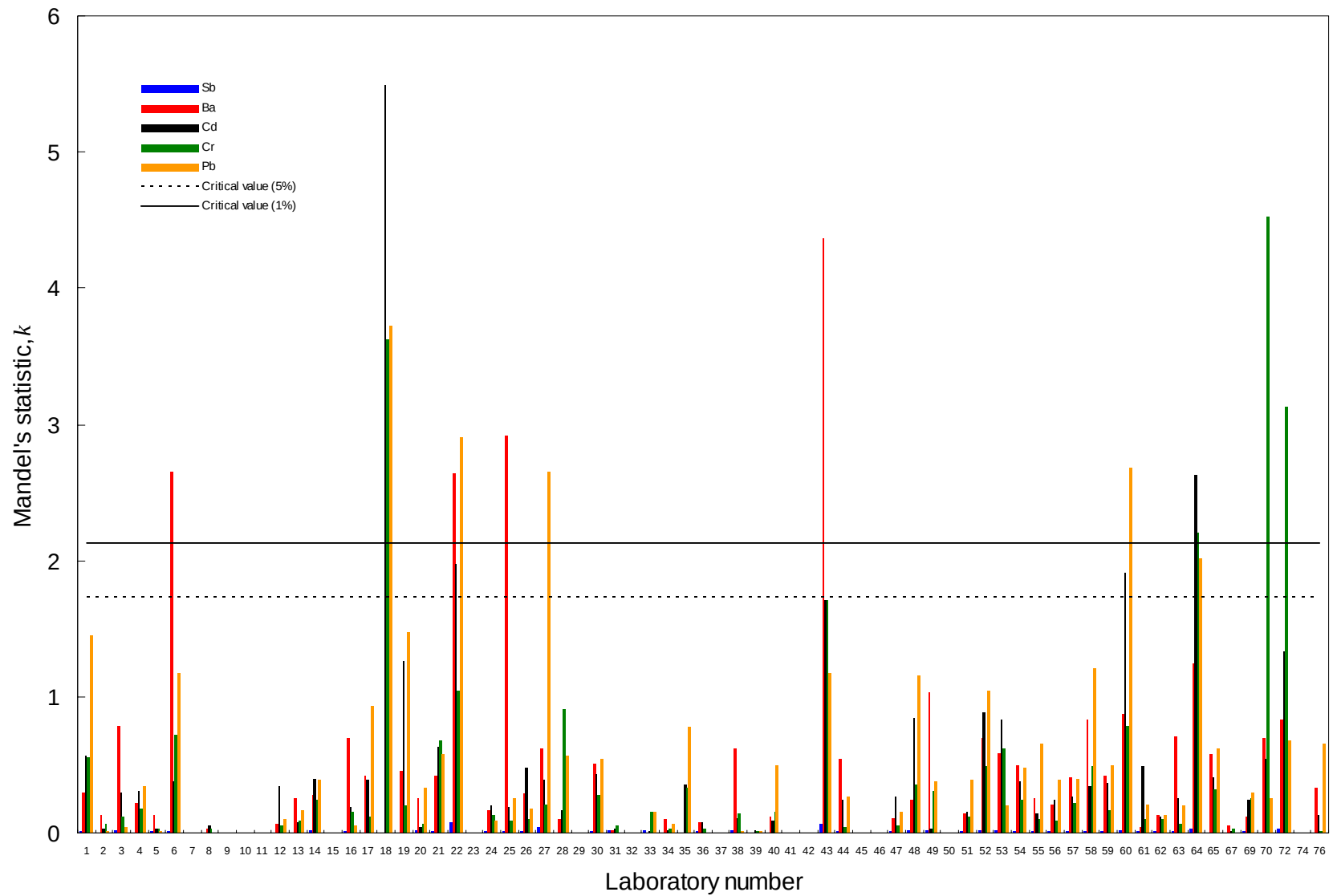


Figure 7 Mandel's within-laboratory consistency statistic, k
(Sample B)

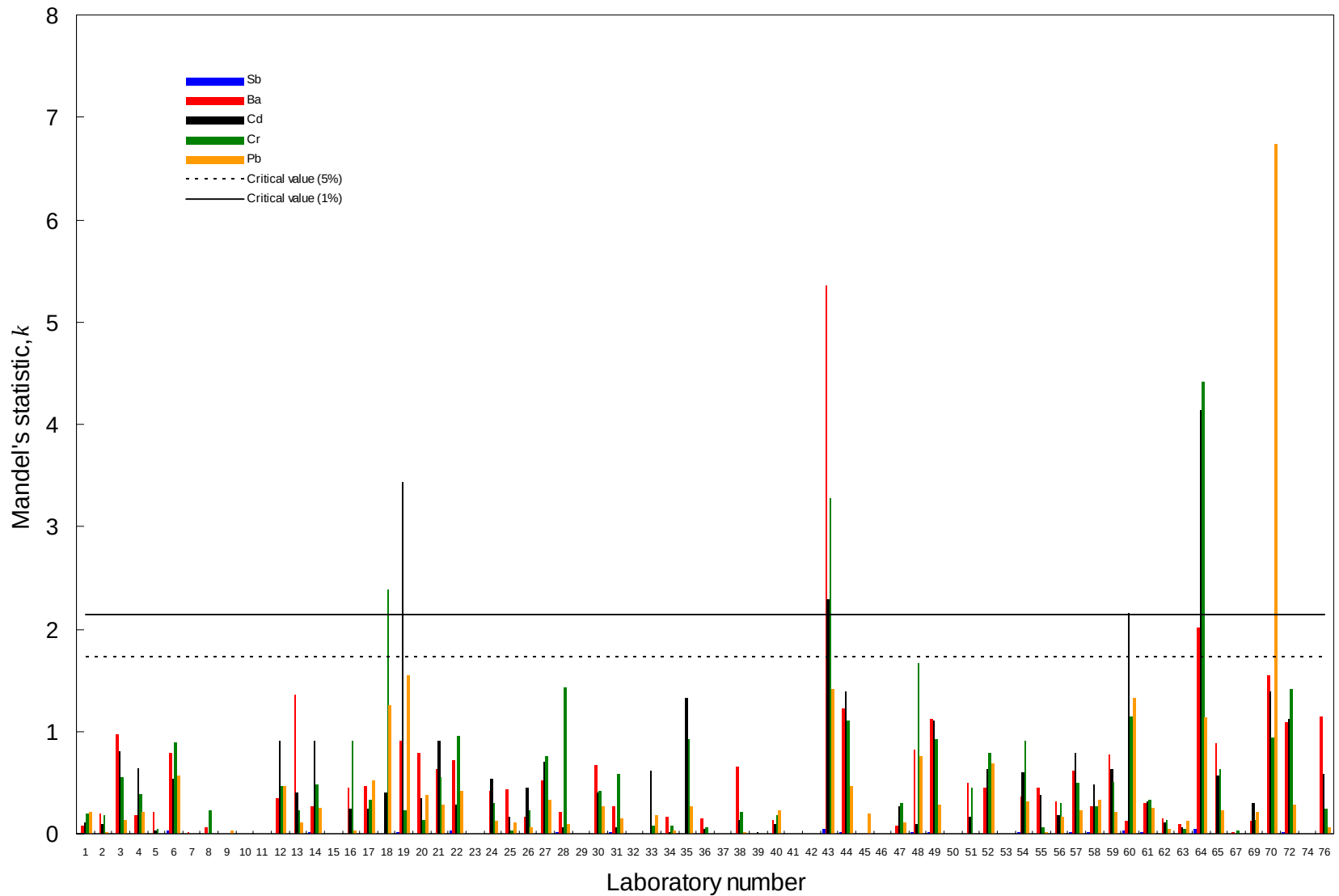


Figure 8 z-score - Antimony (Metal solution)

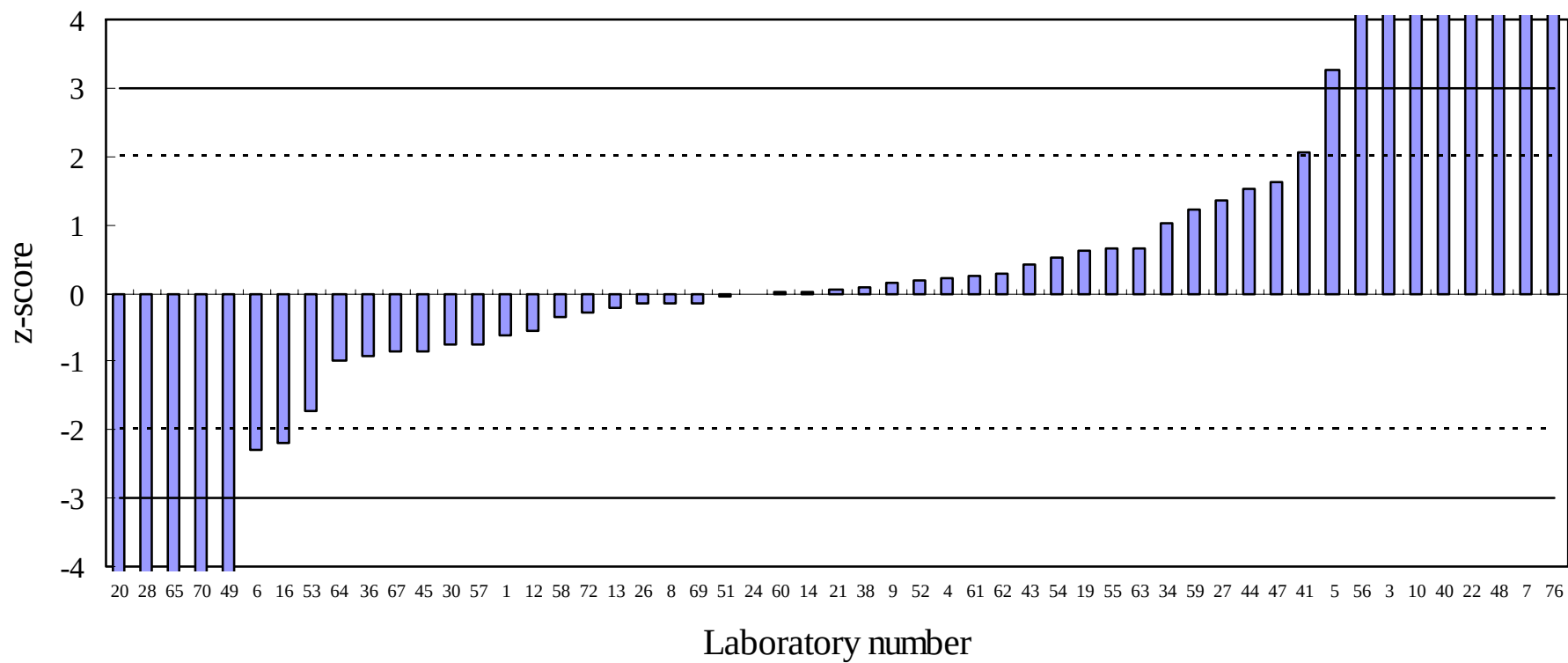


Figure 9 z-score - Barium (Metal solution)

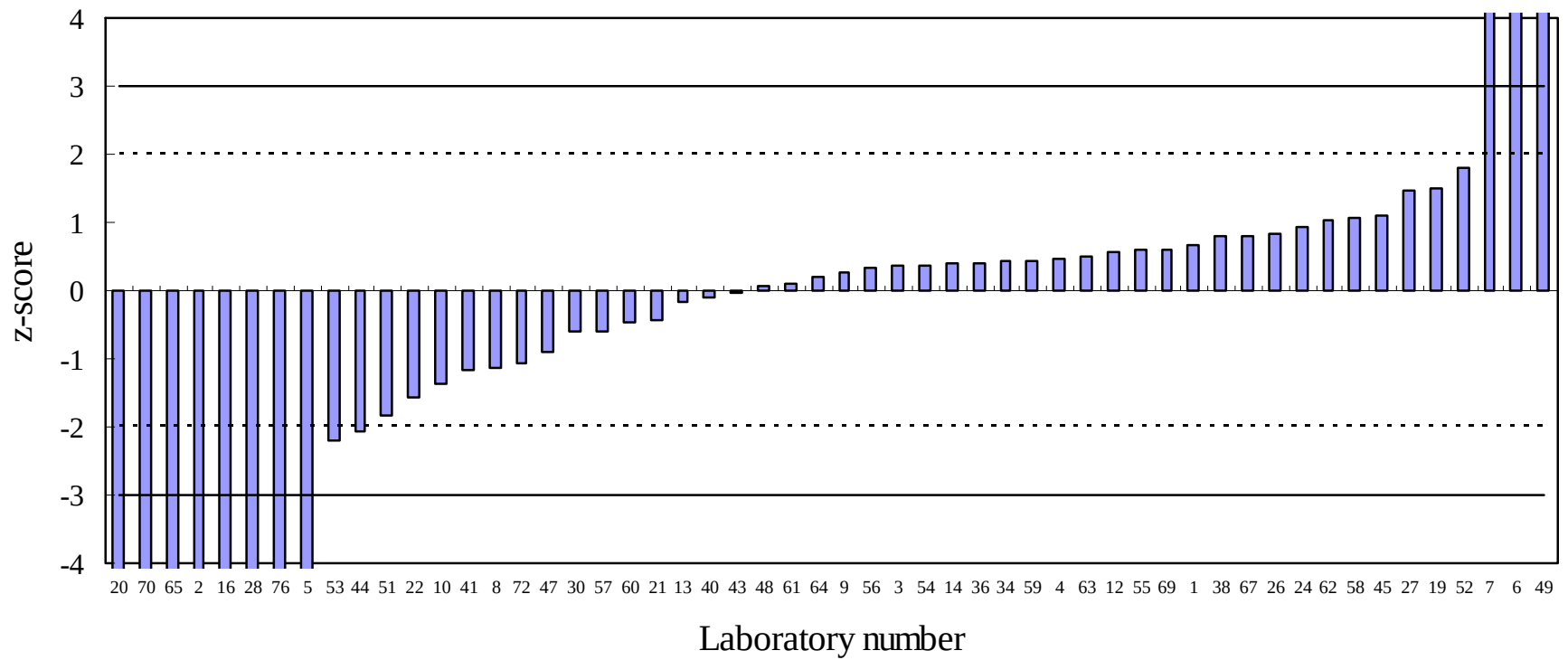


Figure 10 z-score - Cadmium (Metal solution)

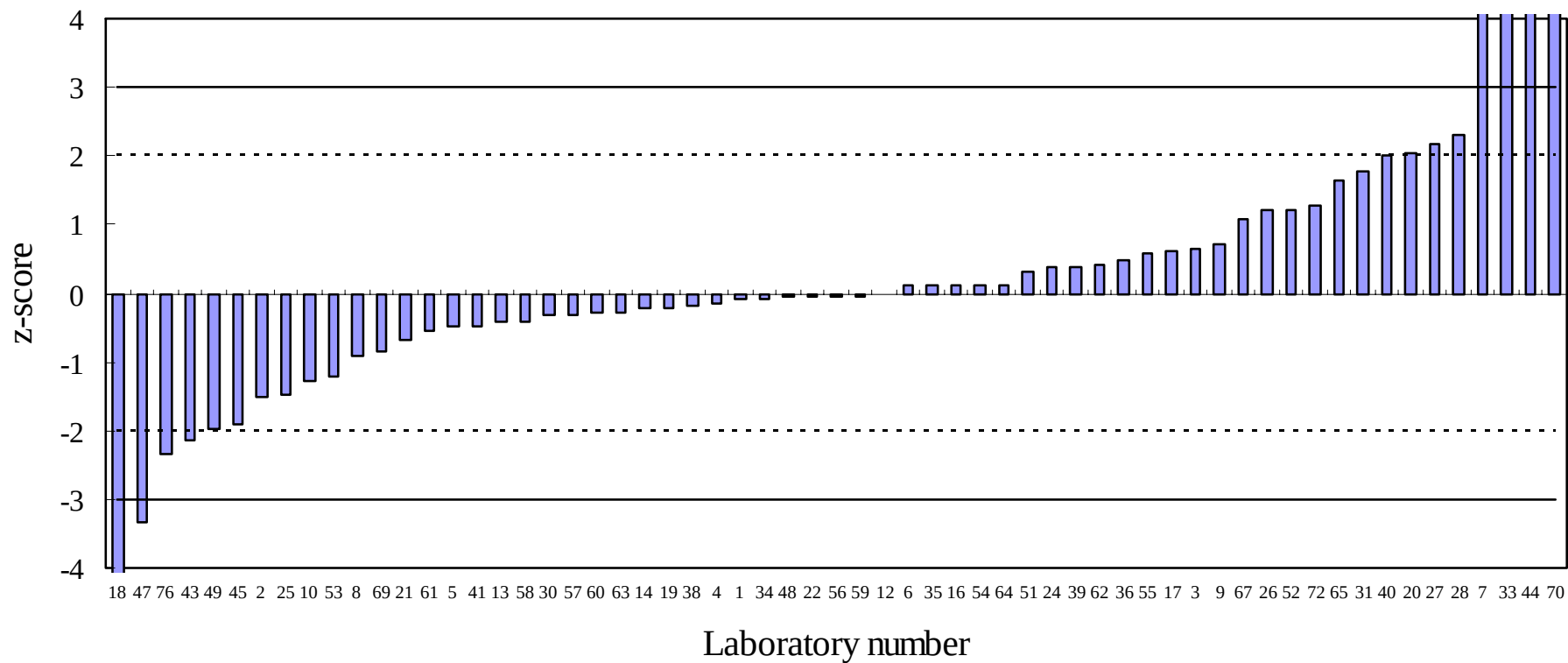


Figure 11 z-score - Chromium (Metal solution)

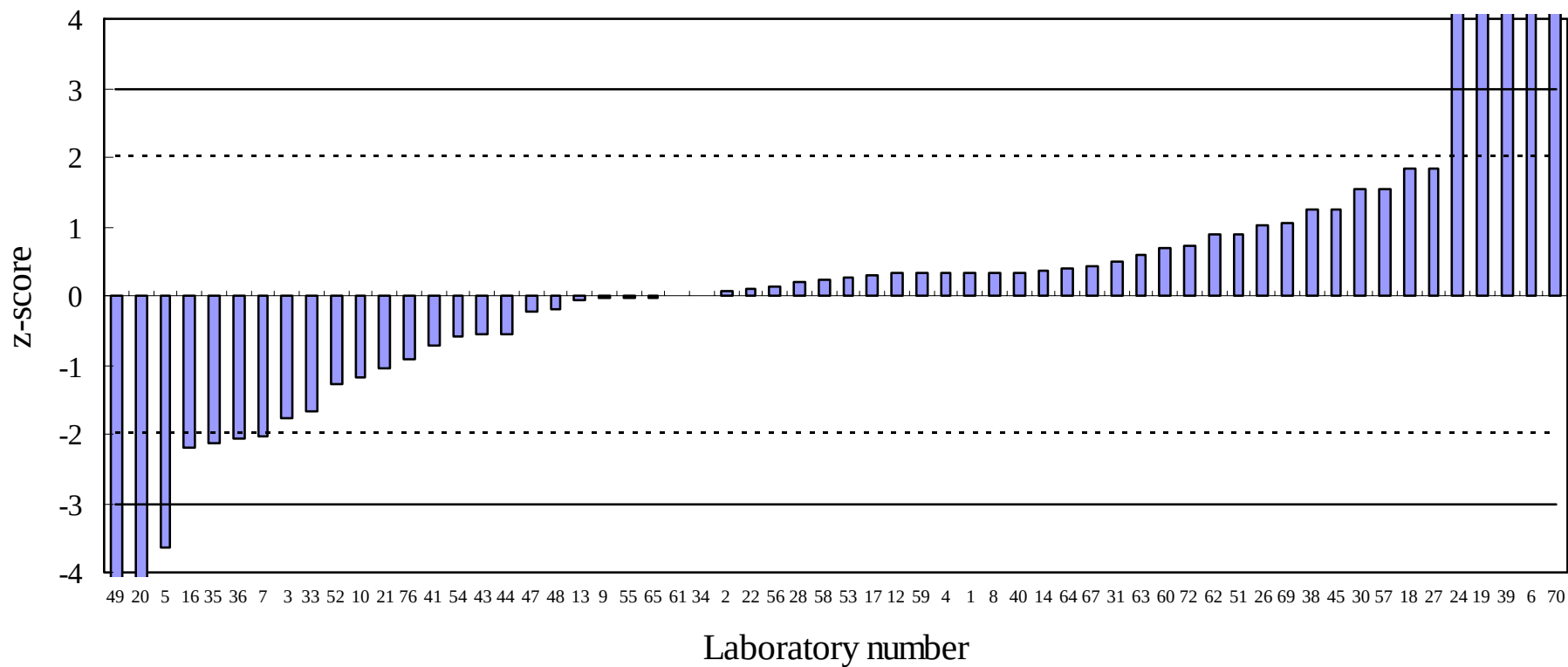


Figure 12 z-score - Lead (Metal solution)

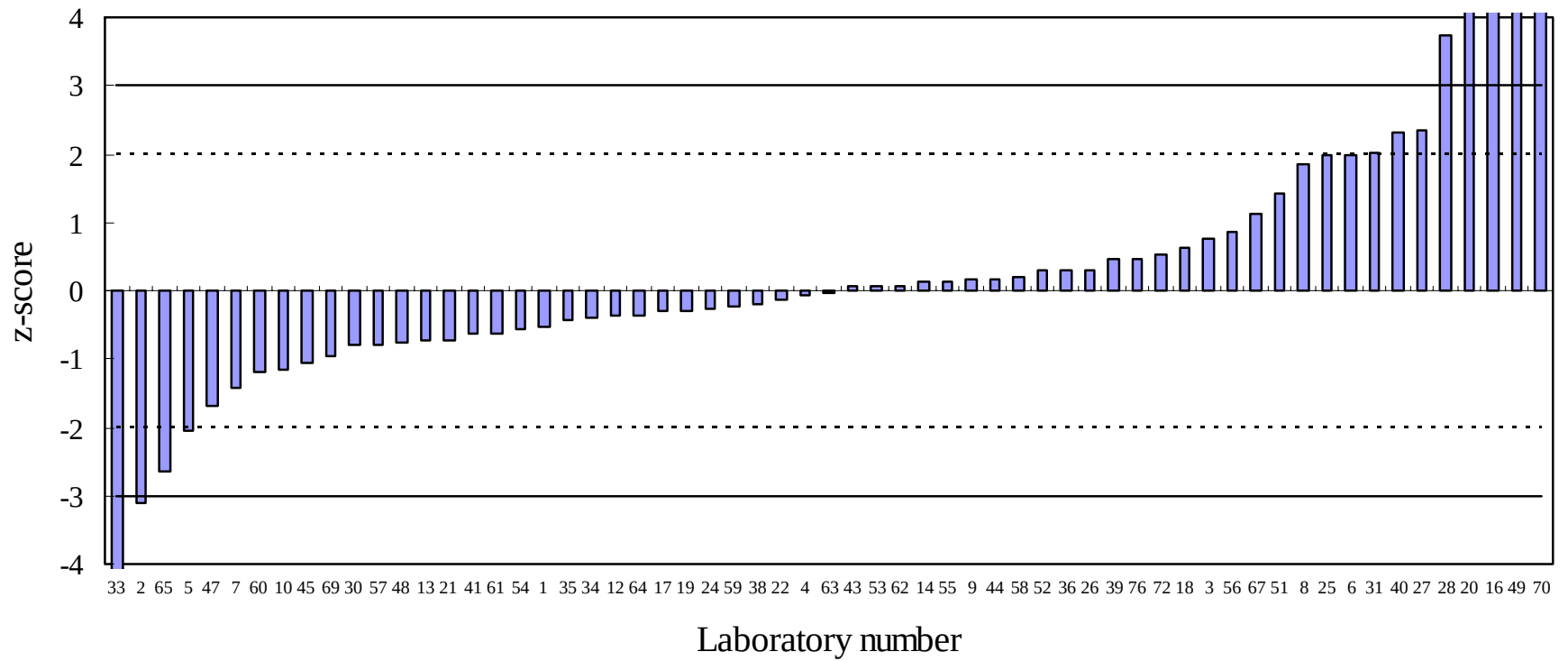


Figure 13 z-score - Antimony (Sample A)

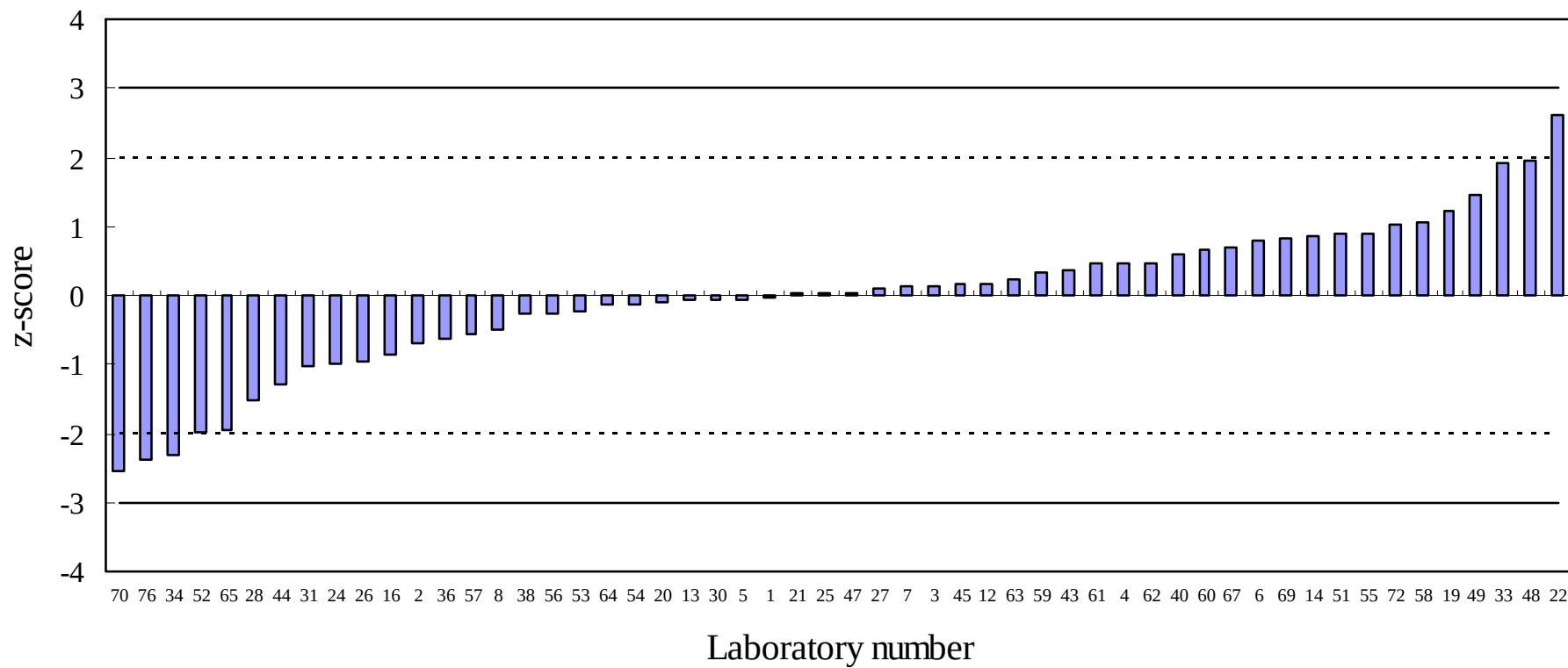


Figure 14 z-score - Barium (Sample A)

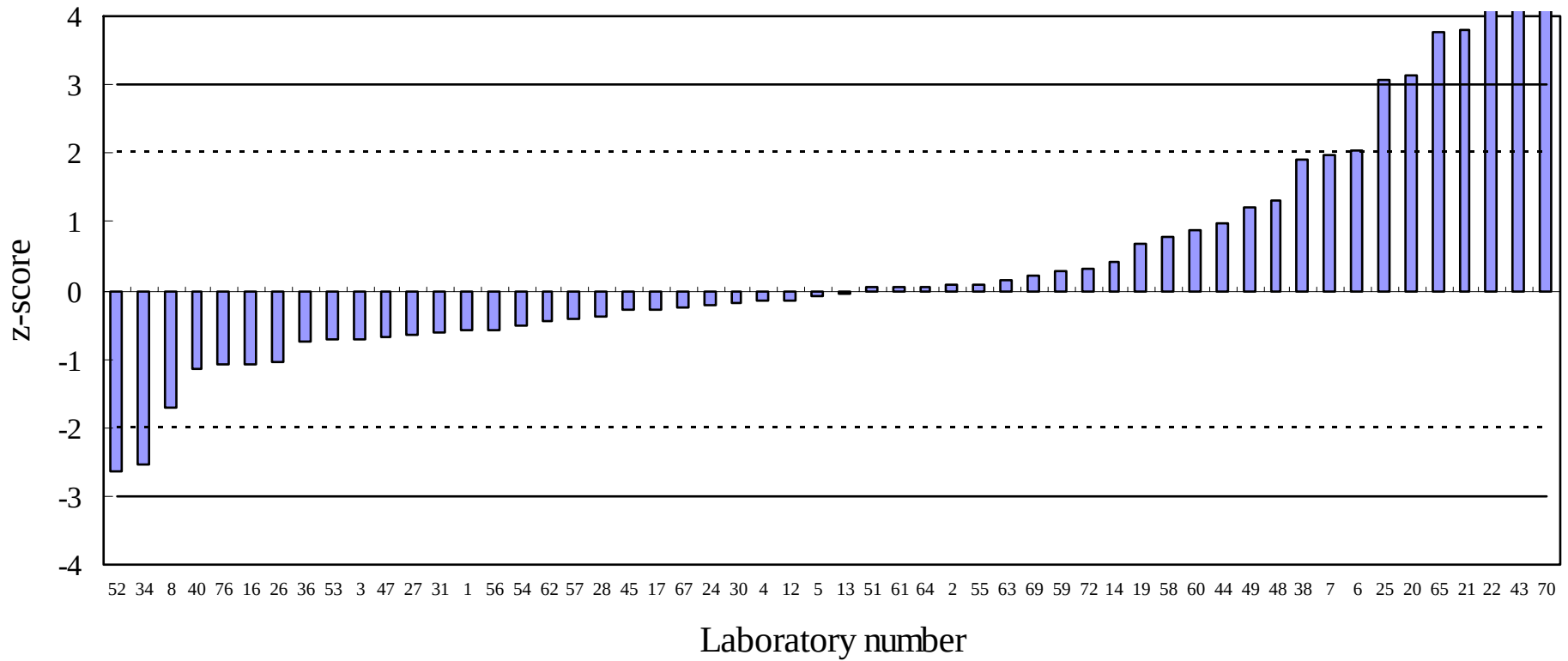


Figure 15 z-score - Cadmium (Sample A)

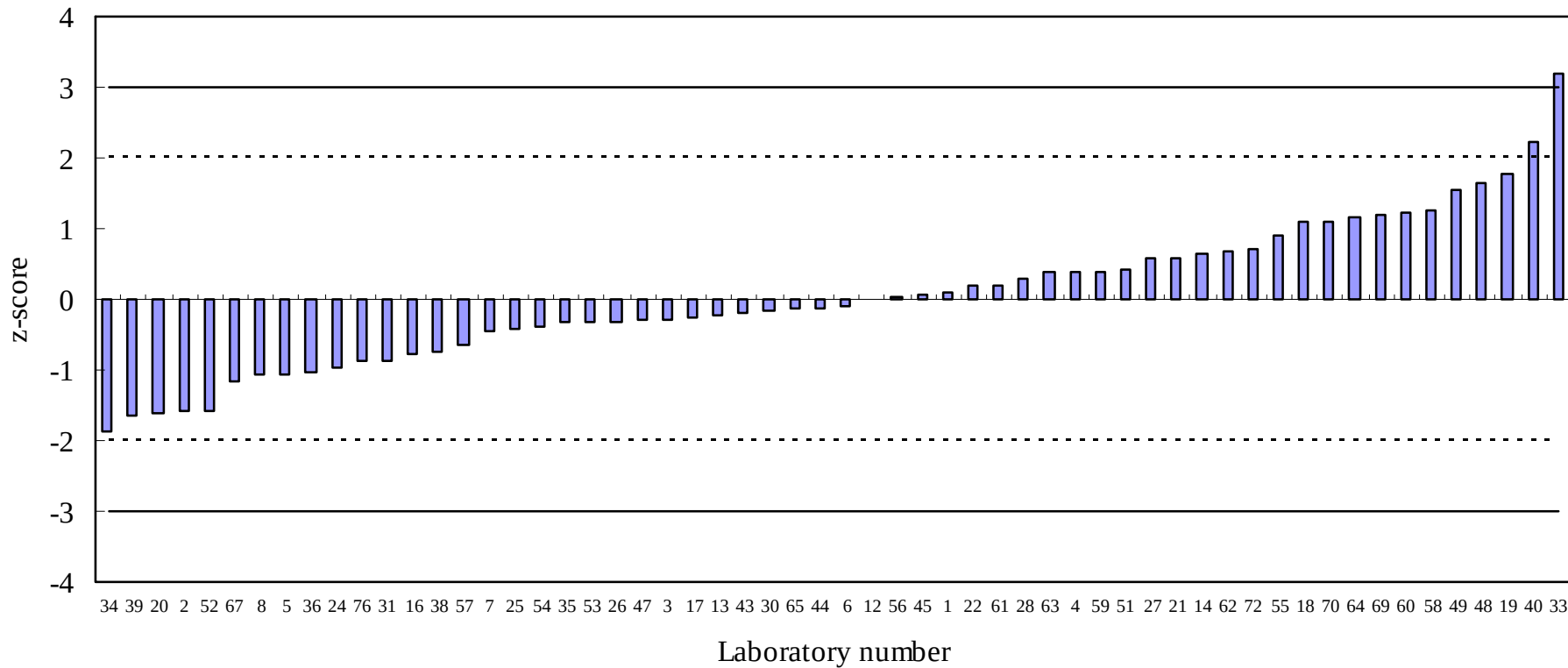


Figure 16 z-score - Chromium (Sample A)

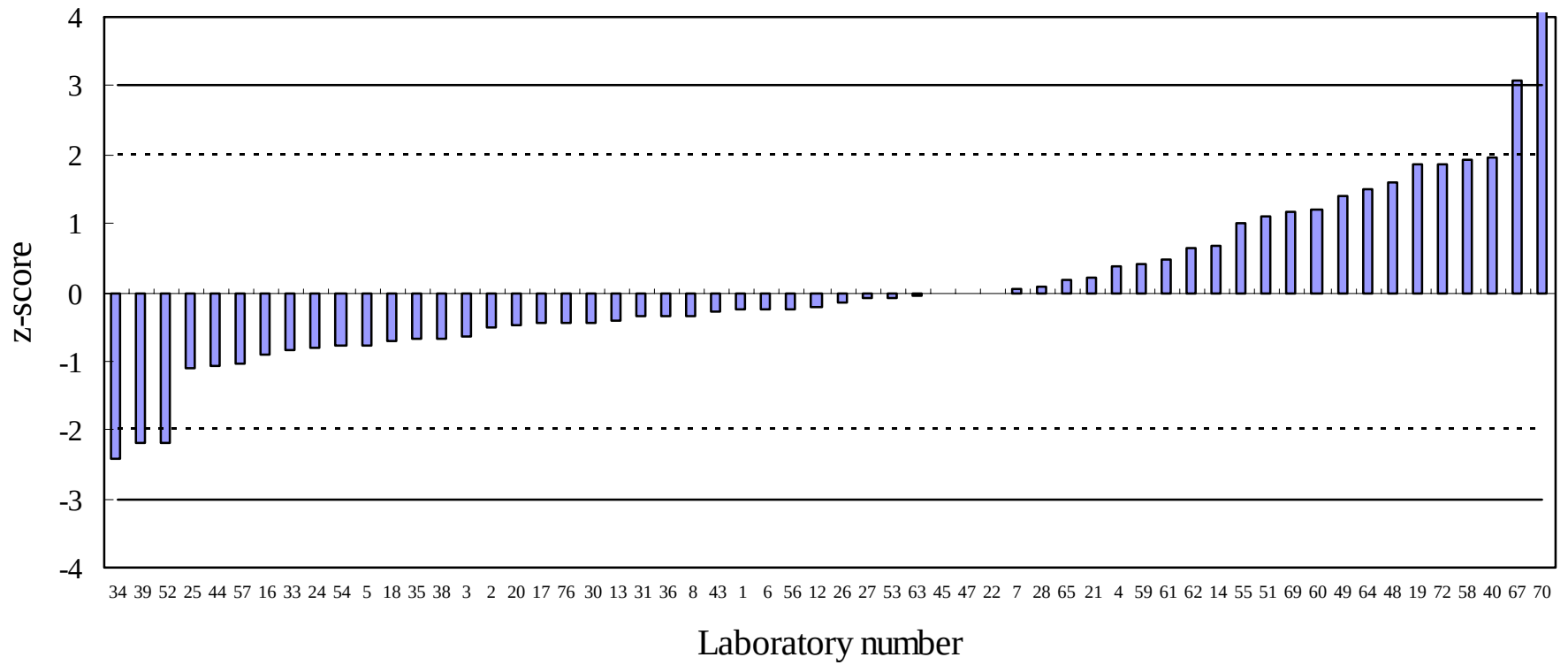


Figure 17 z-score - Lead (Sample A)

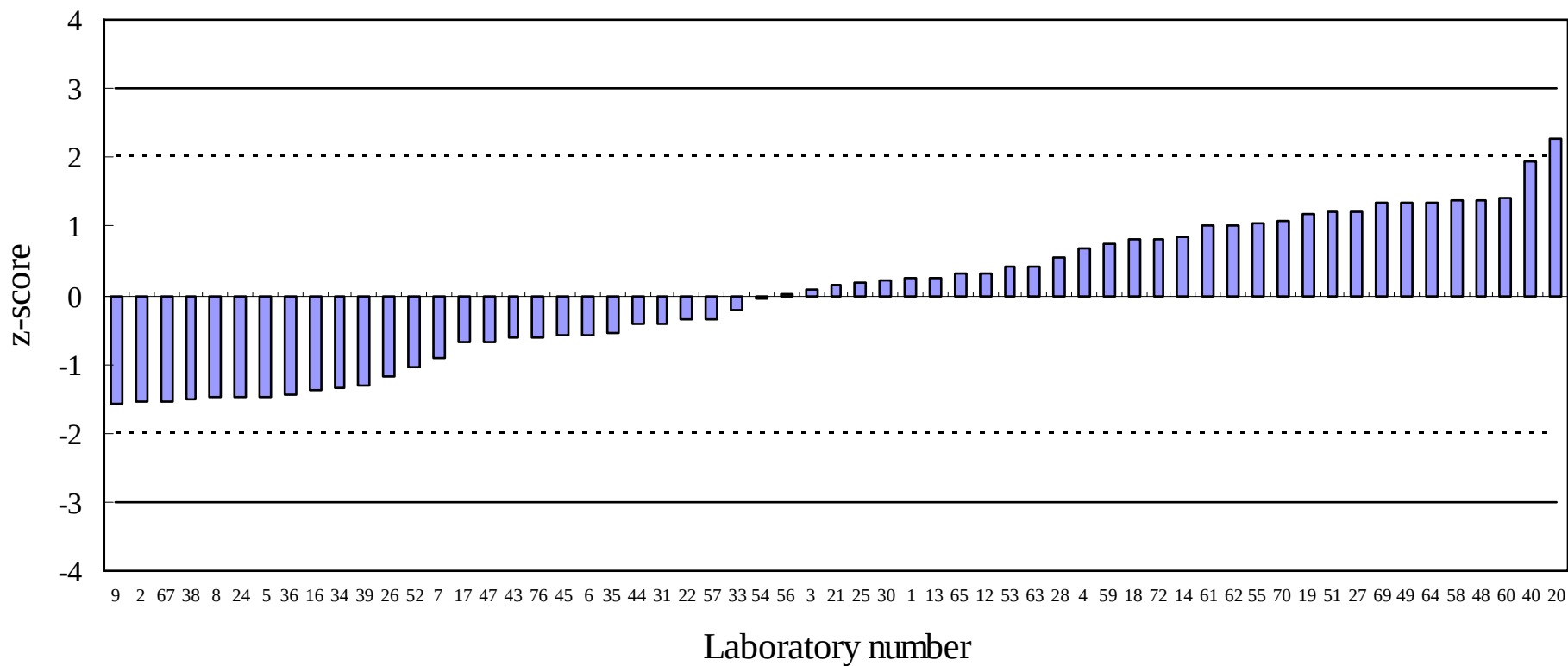


Figure 18 z-score - Antimony (Sample B)

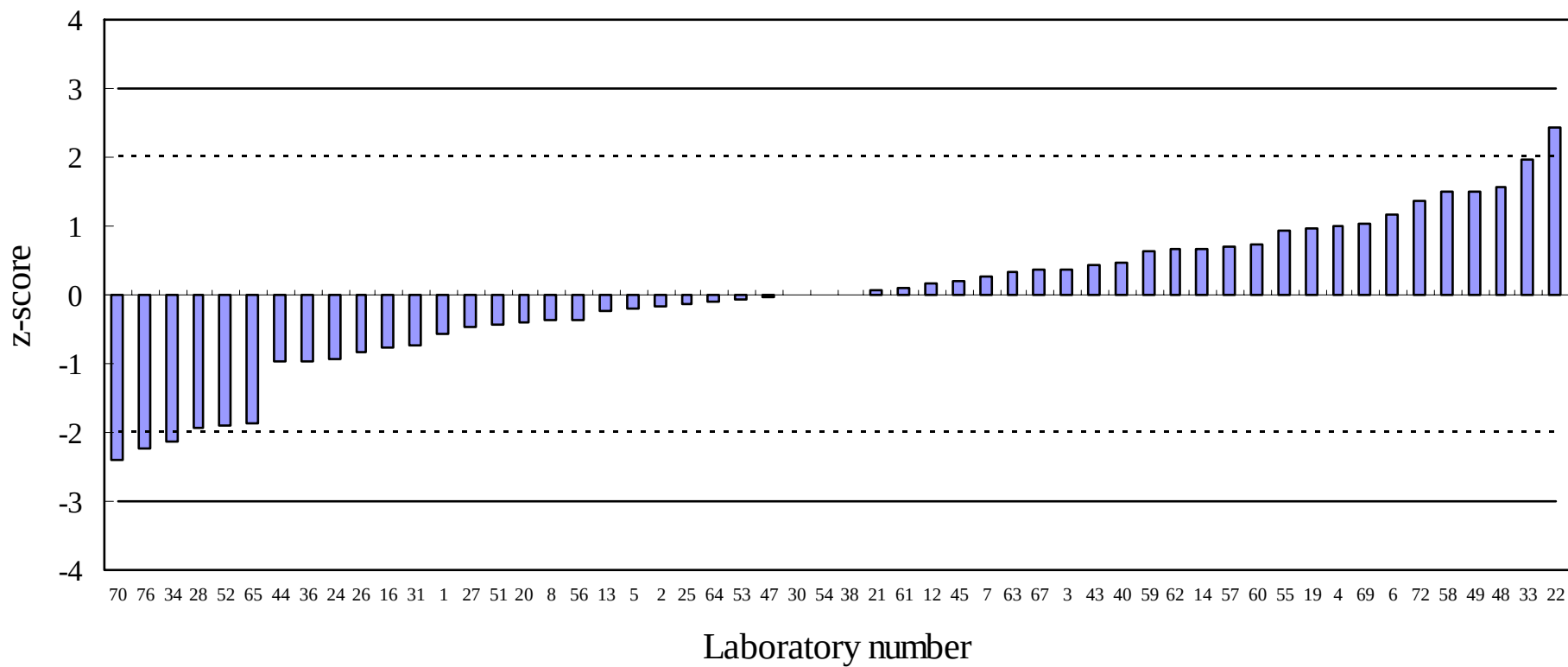


Figure 19 z-score - Barium (Sample B)

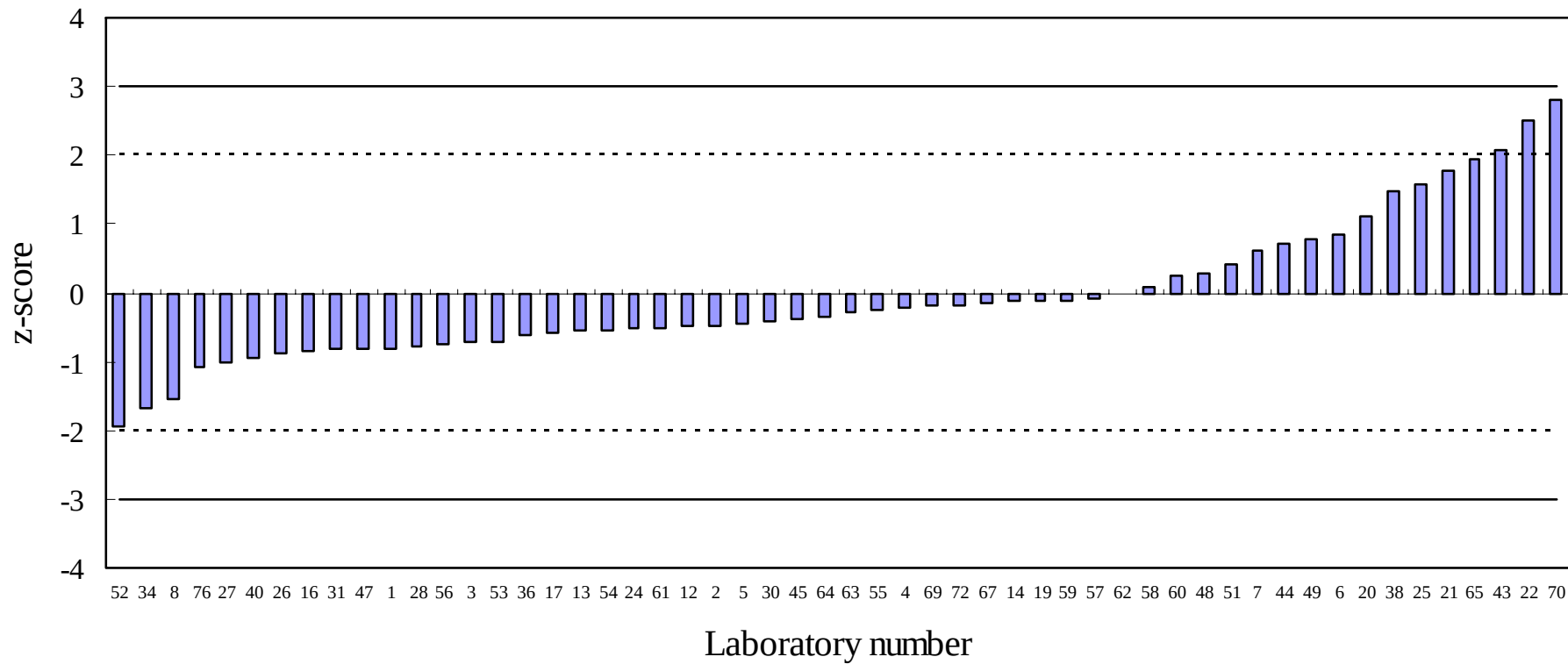


Figure 20 z-score - Cadmium (Sample B)

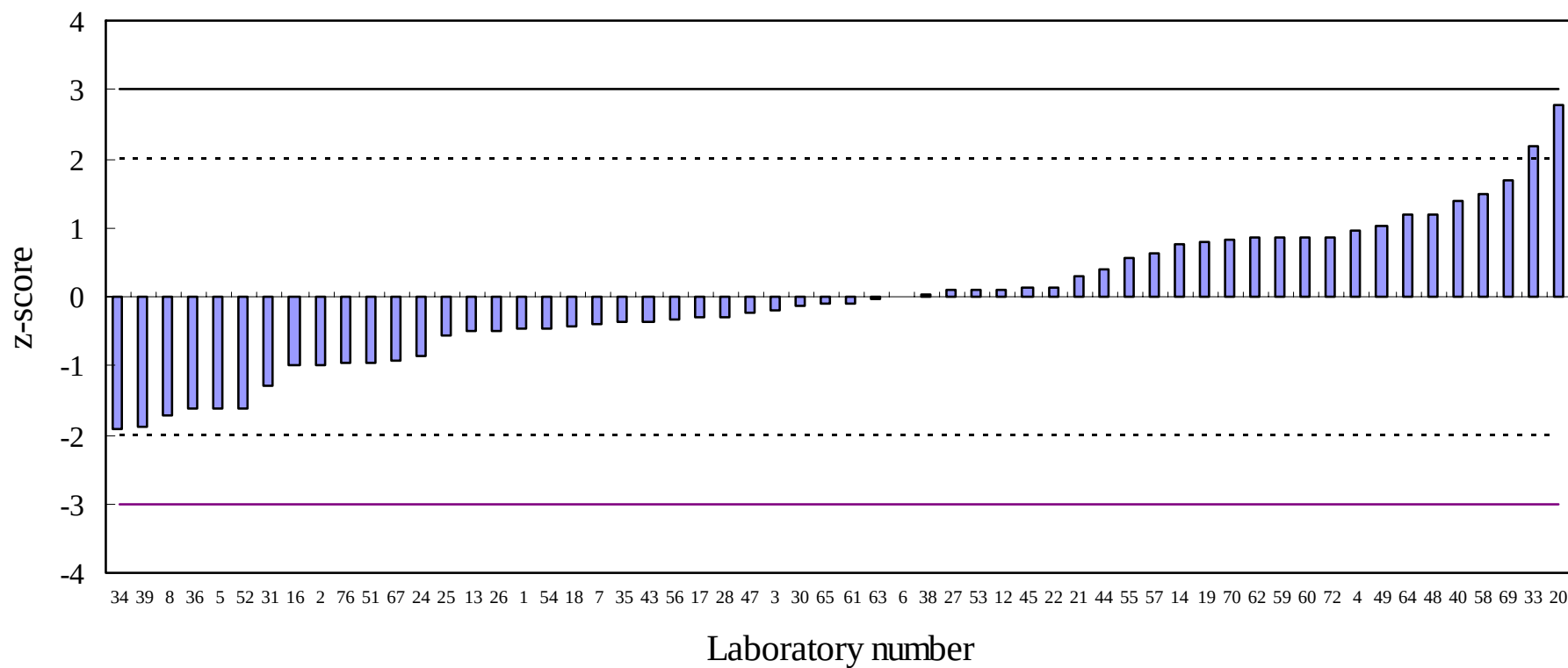


Figure 21 z-score - Chromium (Sample B)

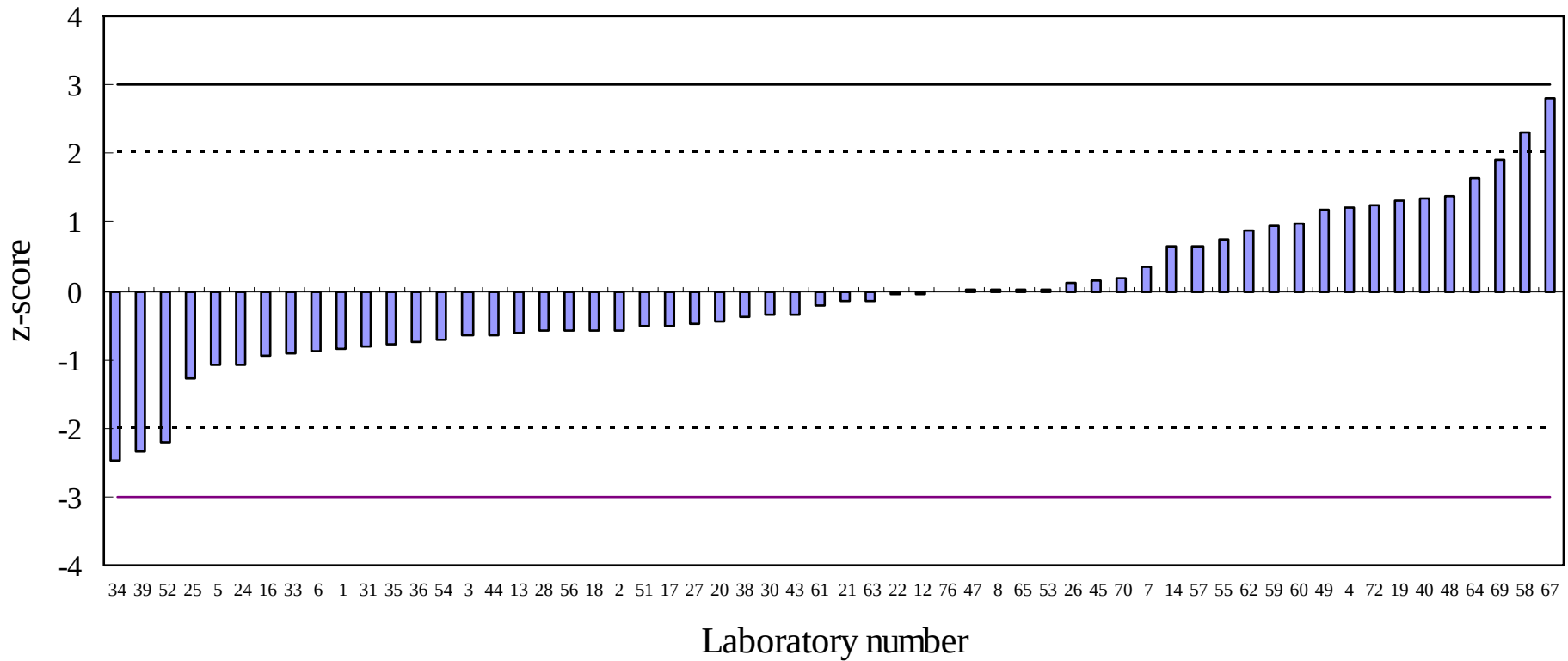


Figure 22 z-score - Lead (Sample B)

