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XRF Application Solutions

FXRV-2024-01

Final Proficiency Test Report for lime

FLX-2002

Bedburg-Hau, June 10th 2024

Correction: September 2024
New issue February 2025: Correction of the presentation of summary results.

Coordinator of PT
Charlotte Winkels-Herding

Statistics and Report
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	Al2O3	BaO	CaO	Fe2O3	K2O	MgO	Mn2O3
Unit	%	%	%	%	%	%	%
No. of laboratories	34	14	35	35	31	35	28
Mean m	0,653	0,005	53,461	0,393	0,074	0,593	0,013
Repoducibility standard deviation s_R	0,036	0,004	0,472	0,025	0,015	0,034	0,003
Repeatability standard deviation s_r	0,005	0,002	0,084	0,004	0,002	0,005	0,001
Robust standard deviation s*	0,036	0,003	0,479	0,026	0,015	0,035	0,003
Uncertainty U (s*)	0,016	0,002	0,202	0,011	0,007	0,015	0,002
Uncertainty U (s_R)	0,015	0,003	0,199	0,011	0,007	0,014	0,001
Mean - 2*s_R	0,581	-0,002	52,517	0,343	0,043	0,525	0,006
Mean + 2*s_R	0,725	0,013	54,405	0,442	0,104	0,662	0,019

	Na2O	P2O5	SiO2	SO3	SrO	TiO2	LOI
Unit	%	%	%	%	%	%	%
No. of laboratories	18	27	34	27	27	27	34
Mean m	0,020	0,011	1,735	0,036	0,028	0,028	42,940
Repoducibility standard deviation s_R	0,011	0,003	0,065	0,018	0,003	0,006	0,211
Repeatability standard deviation s_r	0,003	0,001	0,012	0,002	0,001	0,001	0,032
Robust standard deviation s*	0,012	0,003	0,680	0,017	0,003	0,006	0,196
Uncertainty U (s*)	0,007	0,001	0,029	0,008	0,002	0,003	0,084
Uncertainty U (s_R)	0,006	0,001	0,028	0,009	0,001	0,003	0,090
Mean - 2*s_R	-0,002	0,005	1,605	0,000	0,021	0,016	42,519
Mean + 2*s_R	0,042	0,016	1,865	0,073	0,035	0,040	43,361

All values are in mass % and are based on dried sample material

Mean	**calculated from laboratory means using traceable methods only**
s_R	**Reproducibility standard deviation**
s_r	**Repeatability standard deviation**
s*	**Robust standard deviation**
U (s*)	**uncertainty calculated for a confidence interval of P= 95% (k=2)**
U (s_R)	**uncertainty calculated for a confidence interval of P= 95% (k=2)**
Range of tolerance	**Mean ± 2 x s_R ; all labs within this range show satisfactory performance**

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Introduction

FLUXANA GmbH & Co. KG is a company providing services in the field of X-ray fluorescence analysis (XRF).

In 2011, FLUXANA introduced its own quality management.

In 2020 the accreditation of the FLUXANA Laboratory in Bedburg-Hau, Germany, was updated to DIN EN ISO/IEC 17025:2018 and FLUXANA received accreditation as Producer of Reference materials according to DIN EN ISO 17034:2017, as well.

The performance of proficiency tests is not yet accredited. However, the proficiency tests are conducted following the corresponding norms.

Outliers

Outliers in the statistical sense are typically not detected when using robust statistical methods because the robust A+S algorithms were found to work better than the classical approach (which is outlier detection plus arithmetic mean and classical s.d. formula). Obvious blunders are taken out before calculation and will be marked as 'information only'.

Further Information

All laboratory data is listed in the following evaluation report. Additional information about laboratory accreditation and analytical methods used is also provided. Calculation was done only on traceable methods.
Other methods, e.g., XRF using "pressed pellets" as the sample preparation method or XRF with the "standardless analysis" method, which are not traceable can also be used. These values will not be included in the evaluation. They will, however, be shown as 'information only' in the report and laboratory comparison.
The laboratory performance is shown based on z-scores. The diagrams show the laboratory data in comparison with the calculated mean values.

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Participants

MFG Mediterranean Float Glass (Cevital Group)	Algeria
Nuclear Engineering Seibersdorf GmbH	Austria
TBS - Technische Behandlungssysteme GmbH / Bernegger GmbH	Austria
Heidelbergmaterials Antoing cement	Belgium
LHOIST RECHERCHE ET DEVELOPPEMENT SA	Belgium
Zibo Refratechnik Refractories Co.,Ltd.	China
IC2MP - UMR CNRS 7285	France
BMI - BRAAS GmbH	Germany
Daimler AG	Germany
Dorfner Analysezentrum und Anlagenplanungsgesellschaft mbH (Anzaplan)	Germany
Euroglas GmbH	Germany
Fels Vertrieb und Service GmbH & Co. KG; Goslar	Germany
Fels Vertrieb und Service GmbH & Co. KG; Kalkwerk Kaltes Tal	Germany
Fels Vertrieb und Service GmbH & Co. KG; Kalkwerk Rüdersdorf	Germany
Fels Vertriebs und Service GmbH & Co. KG; Kalkwerk Saal	Germany
FLUXANA GmbH & Co. KG	Germany
Gebrüder Pfeiffer SE	Germany
Horn & Co. Analytics GmbH (HUK)	Germany
OPTERRA Wössingen GmbH	Germany
Refratechnik Cement GmbH	Germany
Rigaku Europe SE	Germany
Saint-Gobain Sekurit Deutschland GmbH & Co. KG	Germany
Salzgitter Flachstahl GmbH	Germany
Schwenk Zement KG	Germany
Technische Universität München - TUM	Germany
THYSSENKRUPP STEEL EUROPE AG	Germany
THYSSENKRUPP STEEL EUROPE AG, Zeche Katharina	Germany
TATA STEEL BV	Netherlands
CRH Lab SP z o o	Poland
Moravacem d.o.o	Serbia
UIS Analytical Services	South Africa
LKAB	Sweden
Jura-Cement-Fabriken AG	Switzerland
Omya International AG, Egerkingen CH	Switzerland
Maden Tetkik ve Arama Genel Müdürlügü	Turkey
Impac Exploration Services	USA

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Statistical Evaluation used for this PT

Calculation of Mean m

The mean m for all laboratories is calculated using the Hampel estimator (ISO/TS 20612:2007 9.2.3) based on the laboratory means µ using traceable methods only.

Calculation of reproducibility standard deviation s_R

The reproducibility standard deviation s_R is calculated using the Q-method (ISO/TS 20612:2007 9.2.3).

Calculation of repeatability standard deviation s_r

The repeatability standard deviation s_r is also calculated using the Q-method.

Calculation of robust standard deviation s*

The robust standard deviation s* is calculated from the laboratory means µ using the Q-method.

Calculation of uncertainty U_{s_R} (according to Nordtest TR 537 ed 3.1.)

The **uncertainty U_{s_R}** for a confidence interval of P=95% (k=2) can be calculated from the **reproducibility standard deviation** s_R (factor 1.25 for average median, robust statistics) and the number of participating laboratories p:

$$U_{s_R} = 2 * 1.25 * \frac{s_R}{\sqrt{p}}$$

Calculation of uncertainty U_{s^*} (according to ISO 13528:2022)

The **uncertainty U_{s^*}** for a confidence interval of P=95% (k=2) can be calculated from the **robust standard deviation** s* (factor 1.25 for average median, robust statistics)) and the number of participating laboratories p:

$$U_{s^*} = 2 * 1.25 * \frac{s^*}{\sqrt{p}}$$

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The **uncertainty** U_{s^*} only takes the between laboratories uncertainty into account while the **uncertainty** U_{s_R} also includes the within laboratories uncertainty. Therefore U_{s_R} is recommended for use in accredited laboratories.

Laboratory performance

Laboratory proficiency assessment is based on z-scores.
The **z-score** z is calculated from all laboratory means μ:

$$z = \frac{m - \mu}{s_R}$$

m	Mean value for all laboratories (assigned value)
μ	Mean value of individual laboratory
s_R	Reproducibility standard deviation

Assessment on z-scores:

$\|z\|$ <= 2.0	indicates “satisfactory” performance = generates no signal
2.0 < $\|z\|$ < 3.0	indicates “questionable” performance = generates a warning signal
$\|z\|$ >= 3.0	indicates “unsatisfactory” performance = generates an action signal

Z-scores with 3 >= $|z|$ >= 2 are highlighted with a yellow color, z-scores with $|z|$ >= 3 are highlighted with a red color.

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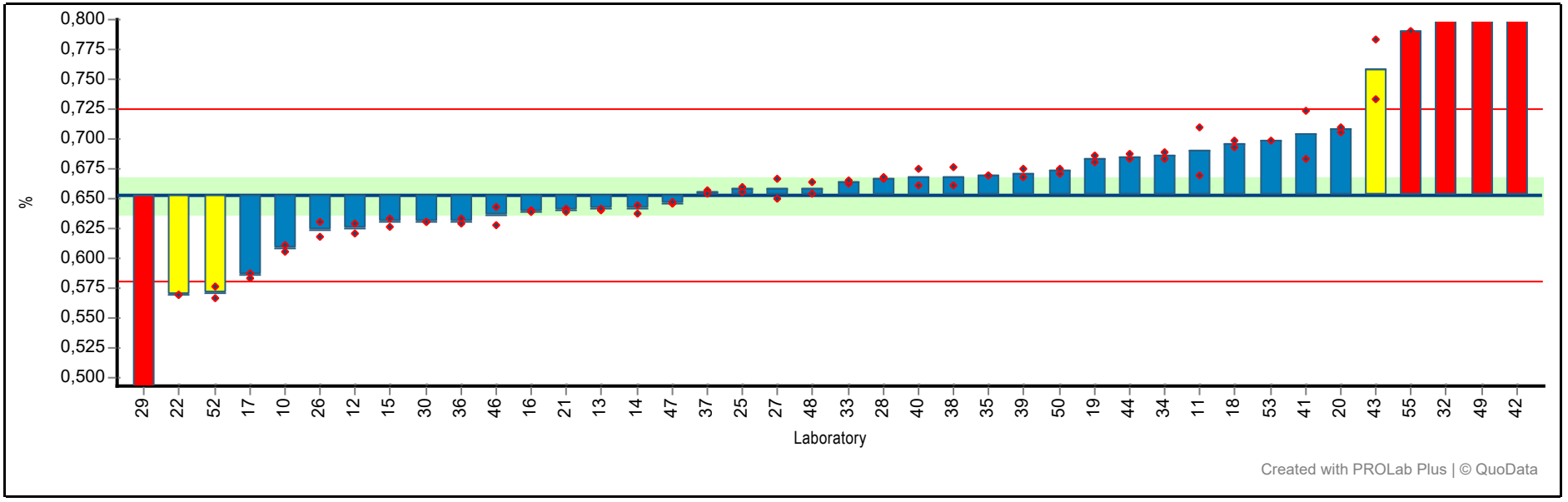
RV_2024_01_Lime

Summary results

Sample:	**FLX-2002**	**Reprod. s.d.:**	**0,036 %**
Measurand:	**Al2O3**	**Repeat. s.d:**	**0,005 %**
Mean ± U(Mean):	**0,653 ± 0,016 %**	**Range of tolerance:**	**0,581 - 0,725 % (|z-score| <= 2,0)**
Number of laboratories in calculation:	**34**	**Statistical method:**	**Q/Hampel**



Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
10	0,611	0,606	0,609	0,004	-1,2	Other Method	ISO 17025	ICP-OES, DIN EN 11885
11	0,710	0,670	0,690	0,028	1,0	XRF (fusion)	ISO 17025	
12	0,621	0,629	0,625	0,006	-0,8	XRF (fusion)	no accredition	ISO 12677
13	0,640	0,642	0,641	0,001	-0,3	XRF (fusion)	no accredition	
14	0,644	0,638	0,641	0,004	-0,3	XRF (fusion)	no accredition	
15	0,633	0,627	0,630	0,004	-0,6	XRF (fusion)	no accredition	

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Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
16	0,640	0,639	0,639	0,001	-0,4	XRF (fusion)	no accredition	DIN EN ISO 12677
17	0,587	0,584	0,585	0,002	-1,9	XRF (fusion)	no accredition	
18	0,699	0,693	0,696	0,004	1,2	Other Method	no accredition	ICP-OES, DIN EN ISO 16976
19	0,681	0,686	0,683	0,004	0,8	XRF (fusion)	no accredition	
20	0,706	0,710	0,708	0,003	1,5	XRF (fusion)	ISO 17025	
21	0,641	0,639	0,640	0,001	-0,4	Other Method	ISO 17025	ICP-OES
22	0,570	0,570	0,570	0,000	-2,3	XRF (fusion)	no accredition	
25	0,660	0,656	0,658	0,003	0,1	XRF (fusion)	no accredition	
26	0,618	0,630	0,624	0,008	-0,8	XRF (fusion)	no accredition	
27	0,650	0,667	0,659	0,012	0,1	XRF (fusion)	ISO 17025	
28	0,666	0,668	0,667	0,001	0,4	XRF (fusion)	no accredition	
29	0,468	0,431	0,450	0,026	-5,6	XRF (fusion)	ISO 17025	
30	0,630	0,630	0,630	0,000	-0,6	XRF (fusion)	no accredition	
32	0,850	0,850	0,850	0,000	5,5	XRF (pressed pellet)	no accredition	EN 459-2; Info only
33	0,663	0,665	0,664	0,001	0,3	XRF (fusion)	no accredition	
34	0,684	0,689	0,686	0,004	0,9	XRF (fusion)	no accredition	
35	0,670	0,670	0,670	0,000	0,5	XRF (fusion)	no accredition	
36	0,629	0,633	0,631	0,003	-0,6	XRF (fusion)	ISO 17025	
37	0,657	0,654	0,655	0,002	0,1	XRF (fusion)	ISO 17025	
38	0,676	0,661	0,669	0,011	0,4	Other Method	no accredition	ICP-OES
39	0,668	0,675	0,671	0,005	0,5	XRF (fusion)	no accredition	
40	0,661	0,675	0,668	0,010	0,4	XRF (fusion)	no accredition	
41	0,724	0,683	0,704	0,029	1,4	XRF (fusion)	no accredition	
42	1,464	1,438	1,451	0,018	22,1	XRF (pressed pellet)	no accredition	Info only
43	0,783	0,733	0,758	0,035	2,9	XRF (pressed pellet)	no accredition	Info only
44	0,683	0,687	0,685	0,003	0,9	XRF (fusion)	no accredition	
46	0,628	0,643	0,635	0,011	-0,5	XRF (fusion)	no accredition	
47	0,646	0,647	0,647	0,001	-0,2	XRF (fusion)	no accredition	
48	0,654	0,664	0,659	0,007	0,2	XRF (fusion)	ISO 17025	
49	0,866	0,874	0,870	0,006	6,0	XRF (pressed pellet)	no accredition	Info only
50	0,671	0,675	0,673	0,003	0,6	Other Method	no accredition	ICP-OES
52	0,566	0,577	0,571	0,008	-2,3	Other Method	no accredition	ICP-OES
53	0,699		0,699		1,3	XRF (pressed pellet)	no accredition	Info only

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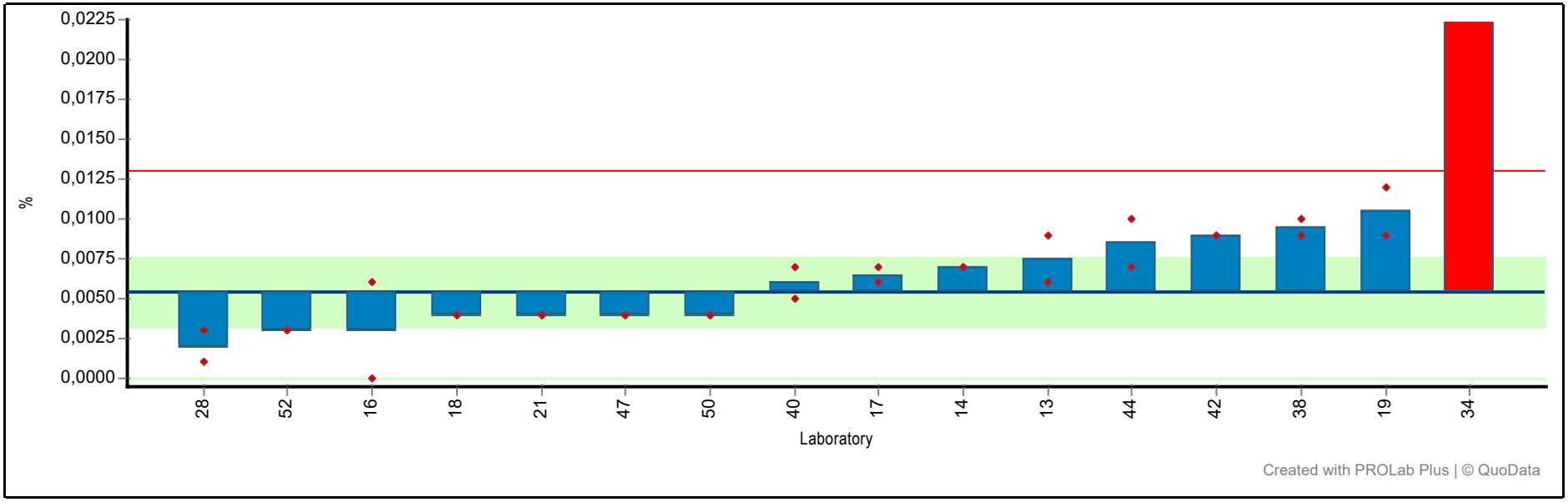
Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
55	0,790	0,790	0,790	0,000	3,8	XRF (pressed pellet)	ISO 17025	Info only

RV_2024_01_Lime

Sample:	**FLX-2002**	**Reprod. s.d.:**	**0,004 %**
Measurand:	**BaO**	**Repeat. s.d:**	**0,002 %**
Mean ± U(Mean):	**0,005 ± 0,002 %**	**Range of tolerance:**	**-0,002 - 0,013 % (|z-score| <= 2,0)**
Number of laboratories in calculation:	**14**	**Statistical method:**	**Q/Hampel**



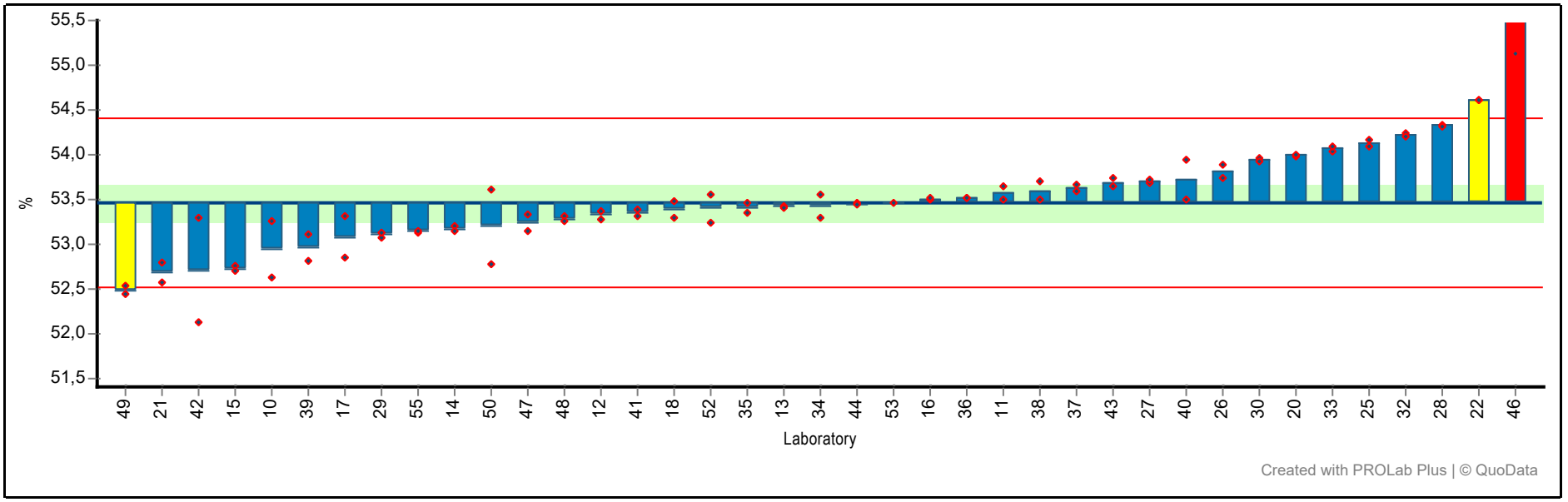
Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
11	<0,010	<0,010	<0,010			XRF (fusion)	ISO 17025	Info only
13	0,009	0,006	0,007	0,002	0,6	XRF (fusion)	no accredition	
14	0,007	0,007	0,007	0,000	0,4	XRF (fusion)	no accredition	
16	0,006	0,000	0,003	0,004	-0,6	XRF (fusion)	no accredition	DIN EN ISO 12677
17	0,006	0,007	0,007	0,001	0,3	XRF (fusion)	no accredition	
18	0,004	0,004	0,004	0,000	-0,4	Other Method	no accredition	ICP-OES, DIN EN ISO 16976
19	0,009	0,012	0,010	0,002	1,3	XRF (fusion)	no accredition	
21	0,004	0,004	0,004	0,000	-0,4	Other Method	ISO 17025	ICP-OES

RV_2024_01_Lime

Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
26	<0,010	<0,010	<0,010			XRF (fusion)	no accredition	Info only
27	<0,010	<0,010	<0,010			XRF (fusion)	ISO 17025	Info only
28	0,001	0,003	0,002	0,001	-0,9	XRF (fusion)	no accredition	
34	0,087	0,087	0,087	0,000	21,3	XRF (fusion)	no accredition	
36	<0,010	<0,010	<0,010			XRF (fusion)	ISO 17025	Info only
38	0,010	0,009	0,009	0,001	1,1	XRF (pressed pellet)	no accredition	Info only
40	0,005	0,007	0,006	0,001	0,2	XRF (fusion)	no accredition	
42	0,009	0,009	0,009	0,000	0,9	XRF (pressed pellet)	no accredition	Info only
44	0,007	0,010	0,009	0,002	0,8	XRF (fusion)	no accredition	
47	0,004	0,004	0,004	0,000	-0,4	Other Method	no accredition	ICP-OES
49	<0,030	<0,030	<0,030			XRF (fusion)	no accredition	Info only
50	0,004	0,004	0,004	0,000	-0,4	Other Method	no accredition	ICP-OES
52	0,003	0,003	0,003	0,000	-0,6	Other Method	no accredition	ICP-OES

RV_2024_01_Lime

Sample:	**FLX-2002**	**Reprod. s.d.:**	**0,472 %**
Measurand:	**CaO**	**Repeat. s.d:**	**0,084 %**
Mean ± U(Mean):	**53,461 ± 0,202 %**	**Range of tolerance:**	**52,517 - 54,405 % (|z-score| <= 2,0)**
Number of laboratories in calculation:	**35**	**Statistical method:**	**Q/Hampel**



Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
10	53,252	52,625	52,939	0,443	-1,1	Other Method	ISO 17025	ICP-OES, DIN EN 11885
11	53,500	53,650	53,575	0,106	0,2	XRF (fusion)	ISO 17025	
12	53,287	53,366	53,326	0,056	-0,3	XRF (fusion)	no accredition	ISO 12677
13	53,428	53,415	53,421	0,009	-0,1	Other Method	no accredition	Titration
14	53,209	53,141	53,175	0,048	-0,6	XRF (fusion)	no accredition	
15	52,750	52,710	52,730	0,028	-1,5	XRF (fusion)	no accredition	
16	53,491	53,520	53,505	0,021	0,1	XRF (fusion)	no accredition	DIN EN ISO 12677
17	53,315	52,850	53,082	0,329	-0,8	XRF (fusion)	no accredition	

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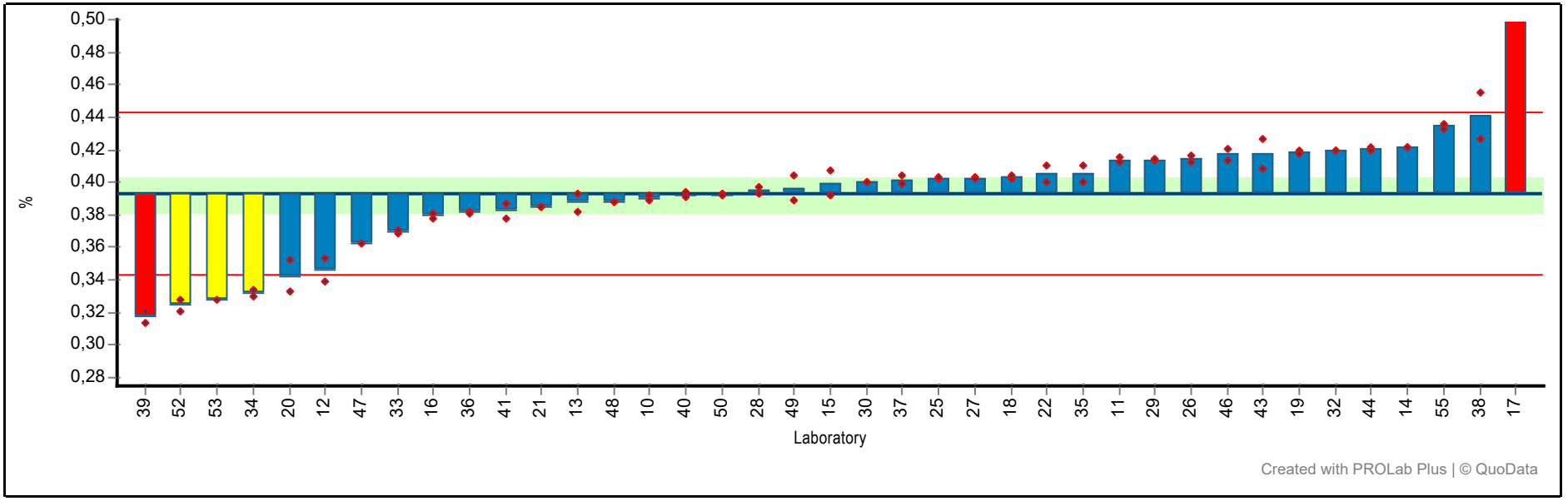
Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
18	53,300	53,487	53,394	0,132	-0,1	Other Method	no accredition	ICP-OES, DIN EN ISO 16976
20	53,989	53,998	53,993	0,006	1,1	XRF (fusion)	ISO 17025	
21	52,572	52,798	52,685	0,160	-1,6	Other Method	ISO 17025	ICP-OES
22	54,610	54,620	54,615	0,007	2,4	XRF (fusion)	no accredition	
25	54,175	54,099	54,137	0,054	1,4	XRF (fusion)	no accredition	
26	53,741	53,882	53,811	0,100	0,7	XRF (fusion)	no accredition	
27	53,694	53,726	53,710	0,023	0,5	XRF (fusion)	ISO 17025	
28	54,340	54,320	54,330	0,014	1,8	XRF (fusion)	no accredition	
29	53,070	53,138	53,104	0,048	-0,8	XRF (fusion)	ISO 17025	
30	53,970	53,920	53,945	0,035	1,0	XRF (fusion)	no accredition	
32	54,240	54,200	54,220	0,028	1,6	XRF (pressed pellet)	no accredition	EN 459-2; Info only
33	54,029	54,101	54,065	0,051	1,3	XRF (fusion)	no accredition	
34	53,550	53,300	53,425	0,177	-0,1	XRF (fusion)	no accredition	
35	53,360	53,460	53,410	0,071	-0,1	XRF (fusion)	no accredition	
36	53,521	53,527	53,524	0,004	0,1	XRF (fusion)	ISO 17025	
37	53,665	53,585	53,625	0,057	0,3	XRF (fusion)	ISO 17025	
38	53,500	53,700	53,600	0,141	0,3	XRF (fusion)	no accredition	
39	52,819	53,119	52,969	0,212	-1,0	XRF (fusion)	no accredition	
40	53,940	53,500	53,720	0,311	0,5	XRF (fusion)	no accredition	
41	53,321	53,394	53,358	0,052	-0,2	XRF (fusion)	no accredition	
42	52,123	53,296	52,709	0,829	-1,6	XRF (pressed pellet)	no accredition	Info only
43	53,653	53,736	53,694	0,059	0,5	Other Method	no accredition	Titration
44	53,460	53,439	53,450	0,015	0,0	XRF (fusion)	no accredition	
46	55,126	56,124	55,625	0,706	4,6	XRF (fusion)	no accredition	
47	53,146	53,325	53,236	0,127	-0,5	XRF (fusion)	no accredition	
48	53,321	53,252	53,287	0,049	-0,4	XRF (fusion)	ISO 17025	
49	52,536	52,442	52,489	0,066	-2,1	XRF (fusion)	no accredition	
50	52,781	53,618	53,200	0,592	-0,6	Other Method	no accredition	ICP-OES
52	53,557	53,244	53,401	0,221	-0,1	Other Method	no accredition	ICP-OES
53	53,460		53,460		0,0	XRF (pressed pellet)	no accredition	Info only
55	53,138	53,145	53,142	0,005	-0,7	XRF (pressed pellet)	ISO 17025	Info only

RV_2024_01_Lime

Sample:	**FLX-2002**	**Reprod. s.d.:**	**0,025 %**
Measurand:	**Fe2O3**	**Repeat. s.d:**	**0,004 %**
Mean ± U(Mean):	**0,393 ± 0,011 %**	**Range of tolerance:**	**0,343 - 0,442 % (|z-score| <= 2,0)**
Number of laboratories in calculation:	**35**	**Statistical method:**	**Q/Hampel**



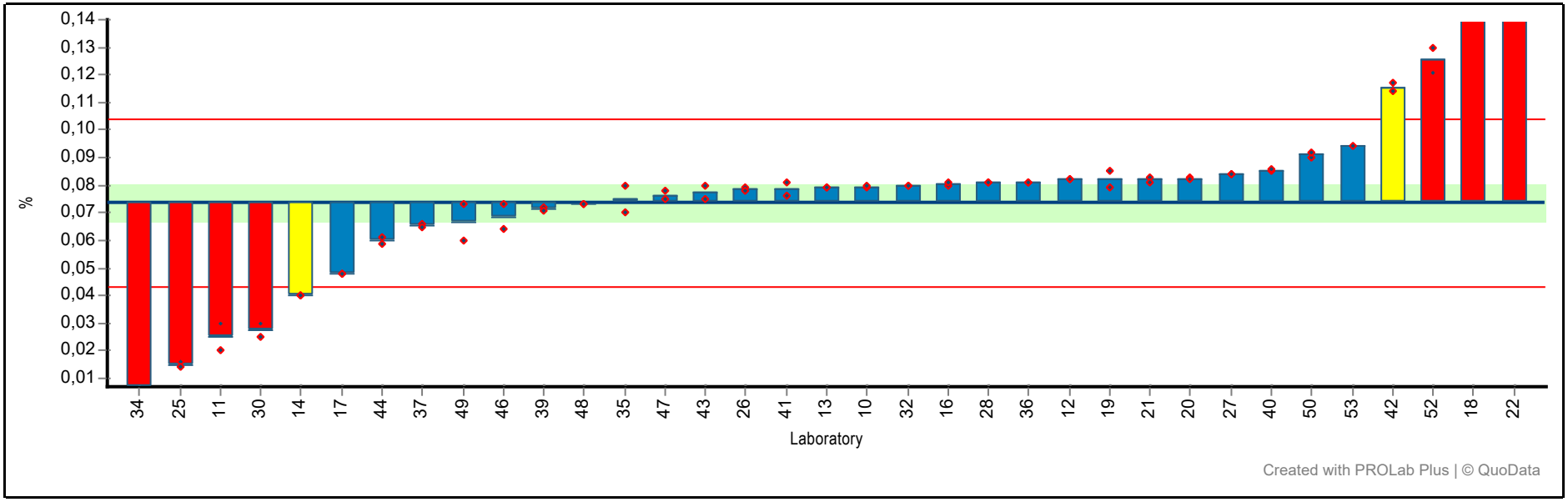
Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
10	0,392	0,389	0,391	0,002	-0,1	Other Method	ISO 17025	ICP-OES, DIN EN 11885
11	0,415	0,412	0,413	0,002	0,8	XRF (fusion)	ISO 17025	
12	0,353	0,339	0,346	0,010	-1,9	XRF (fusion)	no accredition	ISO 12677
13	0,393	0,382	0,388	0,008	-0,2	XRF (fusion)	no accredition	
14	0,422	0,422	0,422	0,000	1,2	XRF (fusion)	no accredition	
15	0,407	0,392	0,399	0,011	0,3	XRF (fusion)	no accredition	
16	0,381	0,378	0,380	0,002	-0,5	XRF (fusion)	no accredition	DIN EN ISO 12677
17	0,778	0,799	0,788	0,015	15,9	XRF (fusion)	no accredition	

RV_2024_01_Lime

Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
18	0,402	0,404	0,403	0,001	0,4	Other Method	no accredition	ICP-OES, DIN EN ISO 16976
19	0,420	0,418	0,419	0,001	1,1	XRF (fusion)	no accredition	
20	0,352	0,333	0,343	0,013	-2,0	XRF (fusion)	ISO 17025	
21	0,385	0,385	0,385	0,000	-0,3	Other Method	ISO 17025	ICP-OES
22	0,400	0,410	0,405	0,007	0,5	XRF (fusion)	no accredition	
25	0,402	0,403	0,403	0,001	0,4	XRF (fusion)	no accredition	
26	0,416	0,412	0,414	0,003	0,9	XRF (fusion)	no accredition	
27	0,403	0,402	0,403	0,001	0,4	XRF (fusion)	ISO 17025	
28	0,393	0,397	0,395	0,003	0,1	XRF (fusion)	no accredition	
29	0,413	0,414	0,413	0,001	0,8	XRF (fusion)	ISO 17025	
30	0,400	0,400	0,400	0,000	0,3	XRF (fusion)	no accredition	
32	0,420	0,420	0,420	0,000	1,1	XRF (pressed pellet)	no accredition	EN 459-2; Info only
33	0,369	0,371	0,370	0,001	-0,9	XRF (fusion)	no accredition	
34	0,334	0,330	0,332	0,003	-2,4	XRF (fusion)	no accredition	
35	0,400	0,410	0,405	0,007	0,5	XRF (fusion)	no accredition	
36	0,382	0,381	0,382	0,001	-0,4	XRF (fusion)	ISO 17025	
37	0,399	0,404	0,402	0,004	0,4	XRF (fusion)	ISO 17025	
38	0,455	0,427	0,441	0,020	1,9	XRF (fusion)	no accredition	
39	0,321	0,314	0,318	0,005	-3,0	XRF (fusion)	no accredition	
40	0,394	0,391	0,393	0,002	0,0	XRF (fusion)	no accredition	
41	0,378	0,387	0,383	0,006	-0,4	XRF (fusion)	no accredition	
43	0,427	0,408	0,417	0,013	1,0	XRF (pressed pellet)	no accredition	Info only
44	0,422	0,420	0,421	0,001	1,1	XRF (fusion)	no accredition	
46	0,413	0,421	0,417	0,006	1,0	XRF (fusion)	no accredition	
47	0,362	0,363	0,362	0,001	-1,2	XRF (fusion)	no accredition	
48	0,388	0,388	0,388	0,000	-0,2	XRF (fusion)	ISO 17025	
49	0,404	0,389	0,397	0,011	0,2	XRF (fusion)	no accredition	
50	0,393	0,392	0,393	0,001	0,0	Other Method	ISO 17025	ICP-OES
52	0,321	0,328	0,325	0,005	-2,7	Other Method	no accredition	ICP-OES
53	0,328		0,328		-2,6	XRF (pressed pellet)	no accredition	Info only
55	0,436	0,433	0,434	0,002	1,7	XRF (pressed pellet)	ISO 17025	Info only

RV_2024_01_Lime

Sample:	**FLX-2002**	**Reprod. s.d.:**	**0,015 %**
Measurand:	**K2O**	**Repeat. s.d:**	**0,002 %**
Mean ± U(Mean):	**0,074 ± 0,007 %**	**Range of tolerance:**	**0,043 - 0,104 % (|z-score| <= 2,0)**
Number of laboratories in calculation:	**31**	**Statistical method:**	**Q/Hampel**



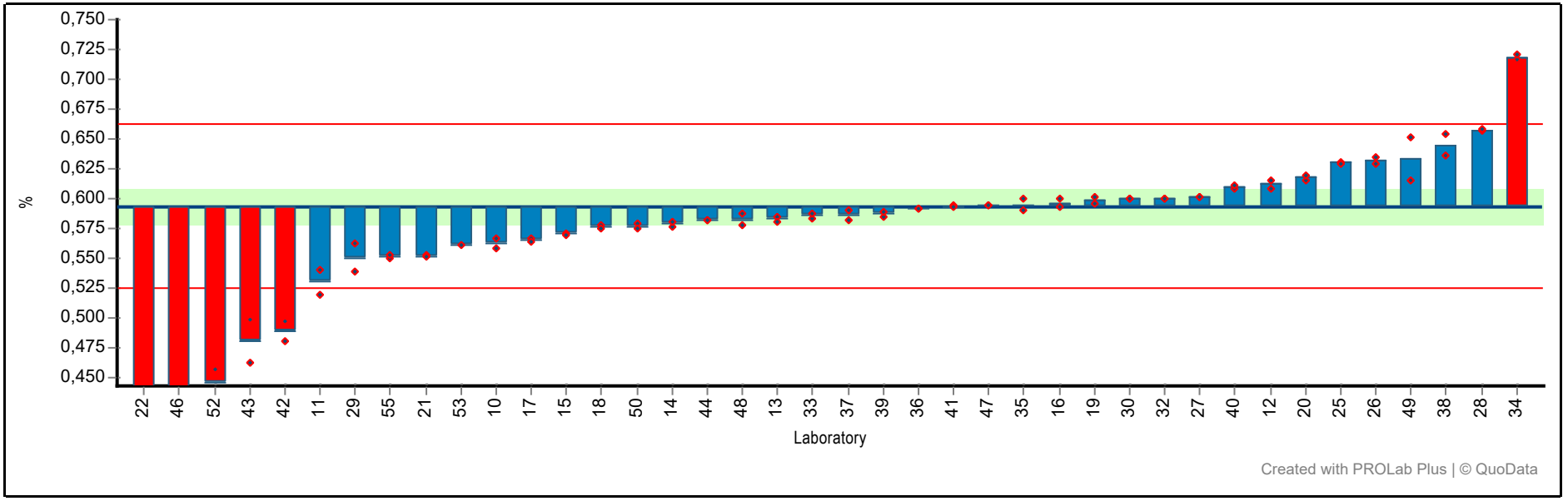
Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
10	0,079	0,080	0,080	0,001	0,4	Other Method	ISO 17025	ICP-OES, DIN EN 11885
11	0,030	0,020	0,025	0,007	-3,2	XRF (fusion)	ISO 17025	
12	0,082	0,082	0,082	0,000	0,5	XRF (fusion)	no accredition	ISO 12677
13	0,079	0,079	0,079	0,000	0,3	XRF (fusion)	no accredition	
14	0,040	0,040	0,040	0,000	-2,2	XRF (fusion)	no accredition	
16	0,080	0,081	0,081	0,001	0,4	XRF (fusion)	no accredition	DIN EN ISO 12677
17	0,048	0,048	0,048	0,000	-1,7	XRF (fusion)	no accredition	
18	0,207	0,212	0,209	0,004	8,9	Other Method	no accredition	ICP-OES, DIN EN ISO 16976

RV_2024_01_Lime

Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
19	0,079	0,085	0,082	0,004	0,5	XRF (fusion)	no accredition	
20	0,083	0,082	0,083	0,001	0,6	XRF (fusion)	ISO 17025	
21	0,083	0,081	0,082	0,001	0,5	Other Method	ISO 17025	ICP-OES
22	0,460	0,440	0,450	0,014	24,7	XRF (fusion)	no accredition	
25	0,016	0,014	0,015	0,001	-3,9	XRF (fusion)	no accredition	
26	0,079	0,078	0,079	0,001	0,3	XRF (fusion)	no accredition	
27	0,084	0,084	0,084	0,000	0,7	XRF (fusion)	ISO 17025	
28	0,081	0,081	0,081	0,000	0,5	XRF (fusion)	no accredition	
30	0,030	0,025	0,028	0,004	-3,0	XRF (fusion)	no accredition	
32	0,080	0,080	0,080	0,000	0,4	XRF (pressed pellet)	no accredition	EN 459-2; Info only
34	0,007	0,007	0,007	0,000	-4,4	XRF (fusion)	no accredition	
35	0,070	0,080	0,075	0,007	0,1	XRF (fusion)	no accredition	
36	0,081	0,081	0,081	0,000	0,5	XRF (fusion)	ISO 17025	
37	0,066	0,065	0,066	0,001	-0,5	XRF (fusion)	ISO 17025	
39	0,072	0,071	0,071	0,001	-0,1	XRF (fusion)	no accredition	
40	0,085	0,086	0,085	0,001	0,8	XRF (fusion)	no accredition	
41	0,076	0,081	0,079	0,004	0,3	XRF (fusion)	no accredition	
42	0,114	0,117	0,116	0,002	2,7	XRF (pressed pellet)	no accredition	Info only
43	0,080	0,075	0,077	0,004	0,3	XRF (pressed pellet)	no accredition	Info only
44	0,059	0,061	0,060	0,001	-0,9	XRF (fusion)	no accredition	
46	0,064	0,073	0,069	0,006	-0,3	XRF (fusion)	no accredition	
47	0,075	0,078	0,076	0,002	0,2	XRF (fusion)	no accredition	
48	0,073	0,073	0,073	0,000	0,0	XRF (fusion)	ISO 17025	
49	0,060	0,073	0,067	0,009	-0,5	XRF (fusion)	no accredition	
50	0,090	0,092	0,091	0,001	1,1	Other Method	ISO 17025	ICP-OES
52	0,130	0,121	0,126	0,006	3,4	Other Method	no accredition	ICP-OES
53	0,094		0,094		1,3	XRF (pressed pellet)	no accredition	Info only

RV_2024_01_Lime

Sample:	**FLX-2002**	**Reprod. s.d.:**	**0,034 %**
Measurand:	**MgO**	**Repeat. s.d:**	**0,005 %**
Mean ± U(Mean):	**0,593 ± 0,015 %**	**Range of tolerance:**	**0,525 - 0,662 % (|z-score| <= 2,0)**
Number of laboratories in calculation:	**35**	**Statistical method:**	**Q/Hampel**



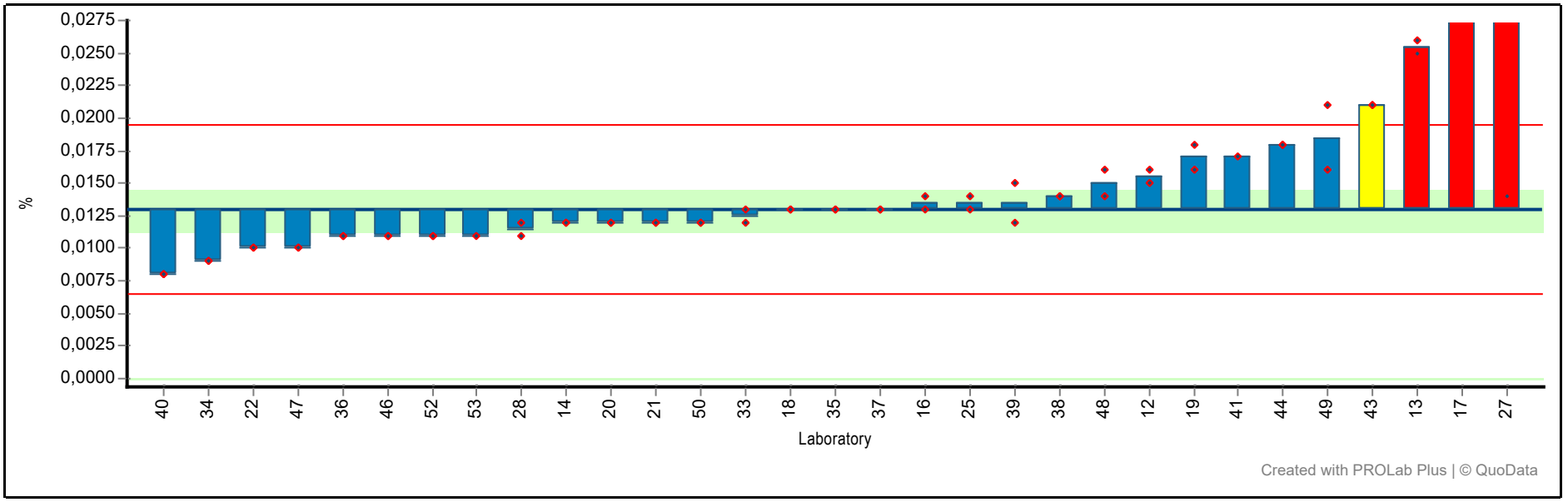
Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
10	0,566	0,558	0,562	0,006	-0,9	Other Method	ISO 17025	ICP-OES, DIN EN 11885
11	0,520	0,540	0,530	0,014	-1,9	XRF (fusion)	ISO 17025	
12	0,609	0,615	0,612	0,004	0,5	XRF (fusion)	no accredition	ISO 12677
13	0,585	0,581	0,583	0,003	-0,3	XRF (fusion)	no accredition	
14	0,576	0,581	0,579	0,004	-0,4	XRF (fusion)	no accredition	
15	0,571	0,570	0,571	0,001	-0,7	XRF (fusion)	no accredition	
16	0,600	0,593	0,597	0,005	0,1	XRF (fusion)	no accredition	DIN EN ISO 12677
17	0,567	0,564	0,565	0,002	-0,8	XRF (fusion)	no accredition	

RV_2024_01_Lime

Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
18	0,578	0,575	0,577	0,002	-0,5	Other Method	no accredition	ICP-OES, DIN EN ISO 16976
19	0,602	0,596	0,599	0,004	0,2	XRF (fusion)	no accredition	
20	0,615	0,620	0,617	0,004	0,7	XRF (fusion)	ISO 17025	
21	0,553	0,551	0,552	0,001	-1,2	Other Method	ISO 17025	ICP-OES
22	0,150	0,180	0,165	0,021	-12,5	XRF (fusion)	no accredition	
25	0,631	0,629	0,630	0,001	1,1	XRF (fusion)	no accredition	
26	0,629	0,635	0,632	0,004	1,1	XRF (fusion)	no accredition	
27	0,602	0,602	0,602	0,000	0,2	XRF (fusion)	ISO 17025	
28	0,657	0,658	0,657	0,001	1,9	XRF (fusion)	no accredition	
29	0,562	0,539	0,550	0,016	-1,3	XRF (fusion)	ISO 17025	
30	0,600	0,600	0,600	0,000	0,2	XRF (fusion)	no accredition	
32	0,600	0,600	0,600	0,000	0,2	XRF (pressed pellet)	no accredition	EN 459-2; Info only
33	0,583	0,588	0,585	0,004	-0,2	XRF (fusion)	no accredition	
34	0,716	0,721	0,718	0,004	3,7	XRF (fusion)	no accredition	
35	0,590	0,600	0,595	0,007	0,0	XRF (fusion)	no accredition	
36	0,591	0,591	0,591	0,000	-0,1	XRF (fusion)	ISO 17025	
37	0,582	0,590	0,586	0,006	-0,2	XRF (fusion)	ISO 17025	
38	0,636	0,654	0,645	0,013	1,5	Other Method	no accredition	ICP-OES
39	0,585	0,589	0,587	0,003	-0,2	XRF (fusion)	no accredition	
40	0,608	0,611	0,609	0,002	0,5	XRF (fusion)	no accredition	
41	0,594	0,593	0,593	0,001	0,0	XRF (fusion)	no accredition	
42	0,481	0,497	0,489	0,011	-3,1	XRF (pressed pellet)	no accredition	Info only
43	0,498	0,463	0,481	0,025	-3,3	XRF (pressed pellet)	no accredition	Info only
44	0,582	0,582	0,582	0,000	-0,3	XRF (fusion)	no accredition	
46	0,399	0,408	0,403	0,006	-5,6	XRF (fusion)	no accredition	
47	0,594	0,595	0,595	0,001	0,0	XRF (fusion)	no accredition	
48	0,578	0,587	0,583	0,006	-0,3	XRF (fusion)	ISO 17025	
49	0,651	0,615	0,633	0,025	1,2	XRF (fusion)	no accredition	
50	0,579	0,575	0,577	0,003	-0,5	Other Method	ISO 17025	ICP-OES
52	0,436	0,457	0,447	0,015	-4,3	Other Method	no accredition	ICP-OES
53	0,561		0,561		-0,9	XRF (pressed pellet)	no accredition	Info only
55	0,550	0,553	0,552	0,002	-1,2	XRF (pressed pellet)	ISO 17025	Info only

RV_2024_01_Lime

Sample:	**FLX-2002**	**Reprod. s.d.:**	**0,003 %**
Measurand:	**Mn2O3**	**Repeat. s.d:**	**0,001 %**
Mean ± U(Mean):	**0,013 ± 0,002 %**	**Range of tolerance:**	**0,006 - 0,019 % (|z-score| <= 2,0)**
Number of laboratories in calculation:	**28**	**Statistical method:**	**Q/Hampel**



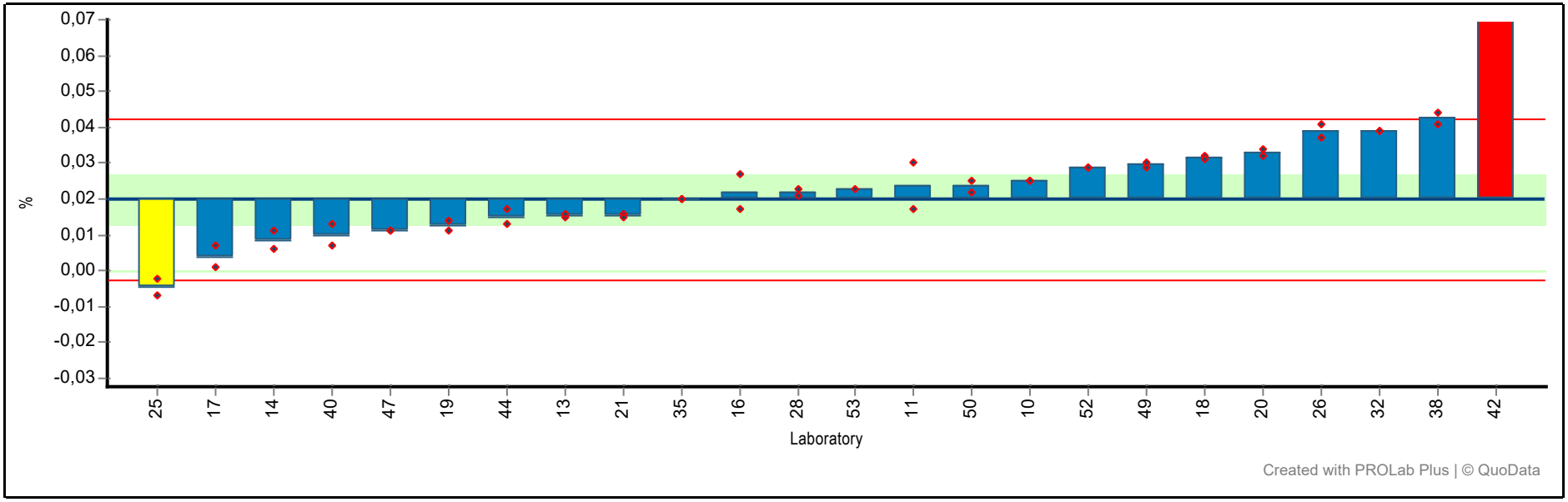
Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
11	<0,010	<0,010	<0,010			XRF (fusion)	ISO 17025	Info only
12	0,016	0,015	0,015	0,001	0,8	XRF (fusion)	no accredition	ISO 12677
13	0,026	0,025	0,026	0,001	3,8	XRF (fusion)	no accredition	
14	0,012	0,012	0,012	0,000	-0,3	XRF (fusion)	no accredition	
16	0,014	0,013	0,013	0,001	0,2	XRF (fusion)	no accredition	DIN EN ISO 12677
17	0,032	0,032	0,032	0,000	5,8	XRF (fusion)	no accredition	
18	0,013	0,013	0,013	0,000	0,0	Other Method	no accredition	ICP-OES, DIN EN ISO 16976
19	0,016	0,018	0,017	0,001	1,2	XRF (fusion)	no accredition	

RV_2024_01_Lime

Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
20	0,012	0,012	0,012	0,000	-0,3	XRF (fusion)	ISO 17025	
21	0,012	0,012	0,012	0,000	-0,3	Other Method	ISO 17025	ICP-OES
22	0,010	0,010	0,010	0,000	-0,9	XRF (fusion)	no accredition	
25	0,014	0,013	0,013	0,001	0,2	XRF (fusion)	no accredition	
26	<0,010	<0,010	<0,010			XRF (fusion)	no accredition	Info only
27	0,014	0,141	0,077	0,090	19,8	XRF (fusion)	ISO 17025	
28	0,011	0,012	0,011	0,001	-0,4	XRF (fusion)	no accredition	
33	0,012	0,013	0,013	0,001	-0,1	XRF (fusion)	no accredition	
34	0,009	0,009	0,009	0,000	-1,2	XRF (fusion)	no accredition	
35	0,013	0,013	0,013	0,000	0,0	XRF (fusion)	no accredition	
36	0,011	0,011	0,011	0,000	-0,6	XRF (fusion)	ISO 17025	
37	0,013	0,013	0,013	0,000	0,0	XRF (fusion)	ISO 17025	
38	0,014	0,014	0,014	0,000	0,3	XRF (pressed pellet)	no accredition	Info only
39	0,012	0,015	0,013	0,002	0,2	XRF (fusion)	no accredition	
40	0,008	0,008	0,008	0,000	-1,5	XRF (fusion)	no accredition	
41		0,017	0,017		1,2	XRF (fusion)	no accredition	
43	0,021	0,021	0,021	0,000	2,5	XRF (pressed pellet)	no accredition	Info only
44	0,018	0,018	0,018	0,000	1,5	XRF (fusion)	no accredition	
46	0,011	0,011	0,011	0,000	-0,6	XRF (fusion)	no accredition	
47	0,010	0,010	0,010	0,000	-0,9	XRF (fusion)	no accredition	
48	0,016	0,014	0,015	0,001	0,6	XRF (fusion)	ISO 17025	
49	0,016	0,021	0,019	0,004	1,7	XRF (fusion)	no accredition	
50	0,012	0,012	0,012	0,000	-0,3	Other Method	ISO 17025	ICP-OES
52	0,011	0,011	0,011	0,000	-0,6	Other Method	no accredition	ICP-OES
53	0,011		0,011		-0,6	XRF (pressed pellet)	no accredition	Info only

RV_2024_01_Lime

Sample:	**FLX-2002**	**Reprod. s.d.:**	**0,011 %**
Measurand:	**Na2O**	**Repeat. s.d:**	**0,003 %**
Mean ± U(Mean):	**0,020 ± 0,007 %**	**Range of tolerance:**	**-0,002 - 0,042 % (|z-score| <= 2,0)**
Number of laboratories in calculation:	**18**	**Statistical method:**	**Q/Hampel**



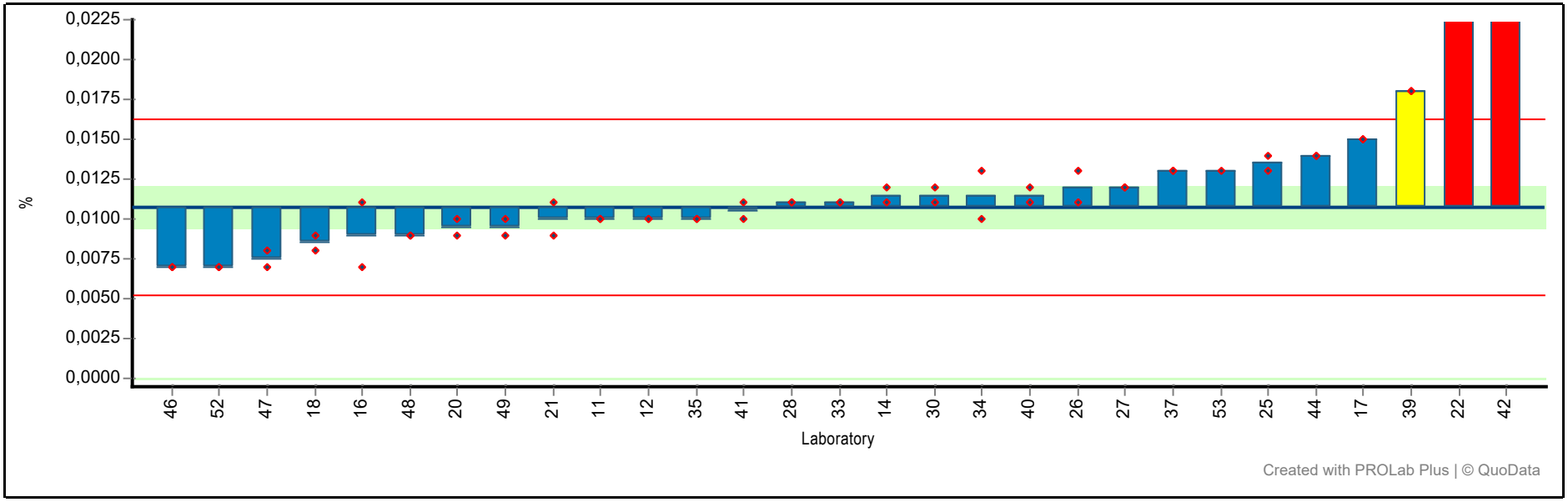
Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
10	0,025	0,025	0,025	0,000	0,5	Other Method	ISO 17025	ICP-OES, DIN EN 11885
11	0,030	0,017	0,024	0,009	0,3	XRF (fusion)	ISO 17025	
13	0,015	0,016	0,015	0,001	-0,4	XRF (fusion)	no accredition	
14	0,011	0,006	0,009	0,004	-1,0	XRF (fusion)	no accredition	
16	0,027	0,017	0,022	0,007	0,2	XRF (fusion)	no accredition	DIN EN ISO 12677
17	0,007	0,001	0,004	0,004	-1,4	XRF (pressed pellet)	no accredition	Info only
18	0,032	0,031	0,032	0,001	1,0	Other Method	no accredition	ICP-OES, DIN EN ISO 16976
19	0,011	0,014	0,013	0,002	-0,7	XRF (fusion)	no accredition	

RV_2024_01_Lime

Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
20	0,034	0,032	0,033	0,001	1,2	XRF (fusion)	ISO 17025	
21	0,016	0,015	0,015	0,001	-0,4	Other Method	ISO 17025	ICP-OES
25	-0,007	-0,002	-0,005	0,004	-2,2	XRF (fusion)	no accredition	
26	0,041	0,037	0,039	0,003	1,7	XRF (fusion)	no accredition	
27	<0,050	<0,050	<0,050			XRF (fusion)	ISO 17025	Info only
28	0,023	0,021	0,022	0,001	0,2	XRF (fusion)	no accredition	
32	0,039	0,039	0,039	0,000	1,7	XRF (pressed pellet)	no accredition	EN 459-2; Info only
35	0,020	0,020	0,020	0,000	0,0	XRF (fusion)	no accredition	
36	<0,060	<0,060	<0,060			XRF (fusion)	ISO 17025	Info only
38	0,041	0,044	0,042	0,002	2,0	XRF (pressed pellet)	no accredition	Info only
40	0,007	0,013	0,010	0,004	-0,9	XRF (fusion)	no accredition	
42	3,761	3,797	3,779	0,025	337,0	XRF (pressed pellet)	no accredition	Info only
44	0,013	0,017	0,015	0,003	-0,4	XRF (fusion)	no accredition	
47	0,011	0,011	0,011	0,000	-0,8	XRF (fusion)	no accredition	
49	0,029	0,030	0,029	0,001	0,9	XRF (pressed pellet)	no accredition	Info only
50	0,022	0,025	0,024	0,002	0,3	Other Method	ISO 17025	ICP-OES
52	0,029	0,029	0,029	0,000	0,8	Other Method	no accredition	ICP-OES
53	0,023		0,023		0,3	XRF (pressed pellet)	no accredition	Info only

RV_2024_01_Lime

Sample:	**FLX-2002**	**Reprod. s.d.:**	**0,003 %**
Measurand:	**P2O5**	**Repeat. s.d:**	**0,001 %**
Mean ± U(Mean):	**0,011 ± 0,001 %**	**Range of tolerance:**	**0,005 - 0,016 % (|z-score| <= 2,0)**
Number of laboratories in calculation:	**27**	**Statistical method:**	**Q/Hampel**



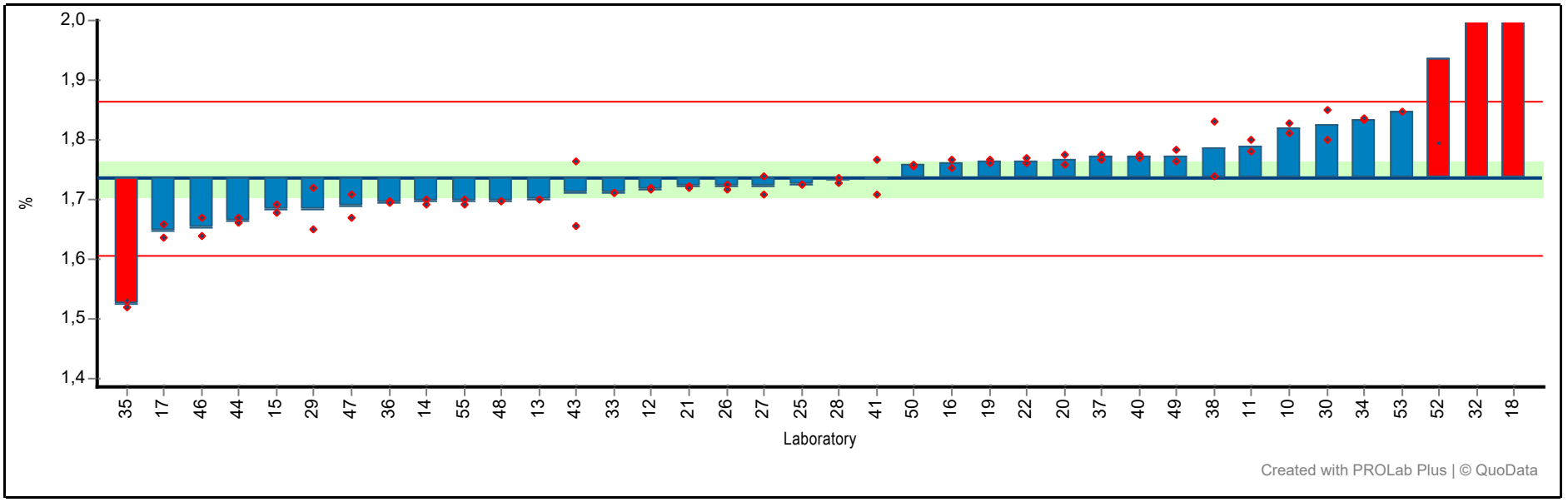
Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
11	0,010	0,010	0,010	0,000	-0,3	XRF (fusion)	ISO 17025	
12	0,010	0,010	0,010	0,000	-0,3	XRF (fusion)	no accredition	ISO 12677
14	0,011	0,012	0,011	0,001	0,3	XRF (fusion)	no accredition	
16	0,007	0,011	0,009	0,003	-0,6	XRF (fusion)	no accredition	DIN EN ISO 12677
17	0,015	0,015	0,015	0,000	1,5	XRF (fusion)	no accredition	
18	0,008	0,009	0,009	0,001	-0,8	Other Method	no accredition	DIN EN 196-2
20	0,010	0,009	0,009	0,001	-0,5	XRF (fusion)	ISO 17025	
21	0,011	0,009	0,010	0,001	-0,3	Other Method	ISO 17025	ICP-OES

RV_2024_01_Lime

Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
22	0,140	0,150	0,145	0,007	48,7	XRF (fusion)	no accredition	
25	0,014	0,013	0,013	0,001	1,0	XRF (fusion)	no accredition	
26	0,013	0,011	0,012	0,001	0,4	XRF (fusion)	no accredition	
27	0,012	0,012	0,012	0,000	0,4	XRF (fusion)	ISO 17025	
28	0,011	0,011	0,011	0,000	0,1	XRF (fusion)	no accredition	
30	0,012	0,011	0,011	0,001	0,3	XRF (fusion)	no accredition	
33	0,011	0,011	0,011	0,000	0,1	XRF (fusion)	no accredition	
34	0,013	0,010	0,011	0,002	0,3	XRF (fusion)	no accredition	
35	0,010	0,010	0,010	0,000	-0,3	XRF (fusion)	no accredition	
36	<0,010	<0,010	<0,010			XRF (fusion)	ISO 17025	info only
37	0,013	0,013	0,013	0,000	0,8	XRF (fusion)	ISO 17025	
39	0,018	0,018	0,018	0,000	2,6	XRF (fusion)	no accredition	
40	0,012	0,011	0,011	0,001	0,3	XRF (fusion)	no accredition	
41	0,011	0,010	0,010	0,001	-0,1	XRF (fusion)	no accredition	
42	0,275	0,275	0,275	0,000	95,8	XRF (pressed pellet)	no accredition	Info only
44	0,014	0,014	0,014	0,000	1,2	XRF (fusion)	no accredition	
46	0,007	0,007	0,007	0,000	-1,4	XRF (fusion)	no accredition	
47	0,007	0,008	0,007	0,001	-1,2	XRF (fusion)	no accredition	
48	0,009	0,009	0,009	0,000	-0,6	XRF (fusion)	ISO 17025	
49	0,009	0,010	0,009	0,001	-0,5	XRF (fusion)	no accredition	
52	0,007	0,007	0,007	0,000	-1,4	Other Method	no accredition	ICP-OES
53	0,013		0,013		0,8	XRF (pressed pellet)	no accredition	Info only

RV_2024_01_Lime

Sample:	**FLX-2002**	**Reprod. s.d.:**	**0,065 %**
Measurand:	**SiO2**	**Repeat. s.d:**	**0,012 %**
Mean ± U(Mean):	**1,735 ± 0,029 %**	**Range of tolerance:**	**1,605 - 1,865 % (|z-score| <= 2,0)**
Number of laboratories in calculation:	**34**	**Statistical method:**	**Q/Hampel**



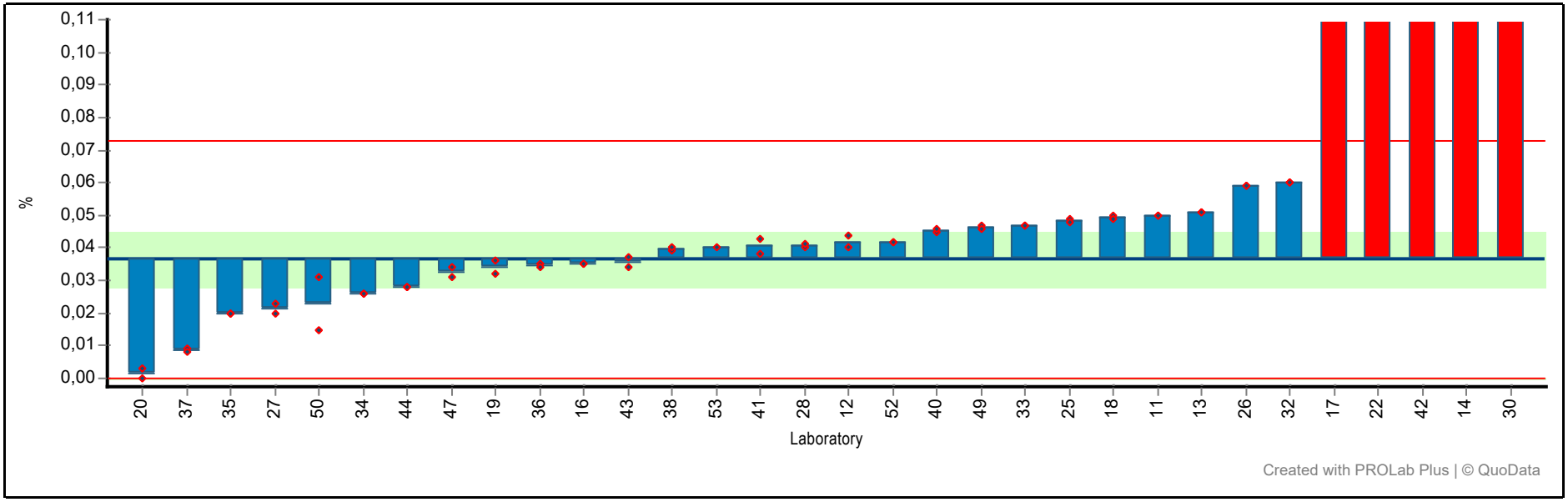
Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
10	1,828	1,811	1,820	0,012	1,3	Other Method	ISO 17025	ICP-OES, DIN EN 11885
11	1,800	1,780	1,790	0,014	0,8	XRF (fusion)	ISO 17025	
12	1,720	1,716	1,718	0,003	-0,3	XRF (fusion)	no accredition	ISO 12677
13	1,701	1,700	1,700	0,001	-0,5	XRF (fusion)	no accredition	
14	1,699	1,693	1,696	0,004	-0,6	XRF (fusion)	no accredition	
15	1,691	1,678	1,684	0,009	-0,8	XRF (fusion)	no accredition	
16	1,767	1,753	1,760	0,010	0,4	XRF (fusion)	no accredition	DIN EN ISO 12677
17	1,658	1,636	1,647	0,016	-1,4	XRF (fusion)	no accredition	

RV_2024_01_Lime

Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
18	2,557	2,415	2,486	0,100	11,6	Other Method	no accredition	ICP-OES, DIN EN ISO 16976
19	1,766	1,760	1,763	0,004	0,4	XRF (fusion)	no accredition	
20	1,759	1,774	1,766	0,011	0,5	XRF (fusion)	ISO 17025	
21	1,722	1,720	1,721	0,001	-0,2	Other Method	ISO 17025	ICP-OES
22	1,760	1,770	1,765	0,007	0,5	XRF (fusion)	no accredition	
25	1,726	1,724	1,725	0,001	-0,2	XRF (fusion)	no accredition	
26	1,726	1,716	1,721	0,007	-0,2	XRF (fusion)	no accredition	
27	1,708	1,739	1,724	0,022	-0,2	XRF (fusion)	ISO 17025	
28	1,737	1,729	1,733	0,006	0,0	XRF (fusion)	no accredition	
29	1,720	1,649	1,684	0,050	-0,8	XRF (fusion)	ISO 17025	
30	1,850	1,800	1,825	0,035	1,4	XRF (fusion)	no accredition	
32	2,070	2,050	2,060	0,014	5,0	XRF (pressed pellet)	no accredition	EN 459-2; Info only
33	1,711	1,710	1,711	0,001	-0,4	XRF (fusion)	no accredition	
34	1,833	1,836	1,835	0,002	1,5	XRF (fusion)	no accredition	
35	1,530	1,520	1,525	0,007	-3,2	XRF (fusion)	no accredition	
36	1,696	1,694	1,695	0,001	-0,6	XRF (fusion)	ISO 17025	
37	1,774	1,768	1,771	0,004	0,6	XRF (fusion)	ISO 17025	
38	1,830	1,740	1,785	0,064	0,8	XRF (fusion)	no accredition	
40	1,776	1,769	1,772	0,005	0,6	XRF (fusion)	no accredition	
41	1,766	1,709	1,738	0,040	0,0	XRF (fusion)	no accredition	
43	1,765	1,655	1,710	0,078	-0,4	XRF (pressed pellet)	no accredition	Info only
44	1,660	1,669	1,664	0,006	-1,1	XRF (fusion)	no accredition	
46	1,639	1,669	1,654	0,021	-1,3	XRF (fusion)	no accredition	
47	1,670	1,707	1,688	0,026	-0,7	XRF (fusion)	no accredition	
48	1,698	1,698	1,698	0,000	-0,6	XRF (fusion)	ISO 17025	
49	1,783	1,764	1,773	0,013	0,6	XRF (fusion)	no accredition	
50	1,756	1,758	1,757	0,001	0,3	Other Method	no accredition	ICP-OES
52	1,795	2,076	1,936	0,199	3,1	Other Method	no accredition	ICP-OES
53	1,846		1,846		1,7	XRF (pressed pellet)	no accredition	Info only
55	1,700	1,693	1,696	0,005	-0,6	XRF (pressed pellet)	ISO 17025	Info only

RV_2024_01_Lime

Sample:	**FLX-2002**	**Reprod. s.d.:**	**0,018 %**
Measurand:	**SO3**	**Repeat. s.d:**	**0,002 %**
Mean ± U(Mean):	**0,036 ± 0,008 %**	**Range of tolerance:**	**0,000 - 0,073 % (|z-score| <= 2,0)**
Number of laboratories in calculation:	**27**	**Statistical method:**	**Q/Hampel**



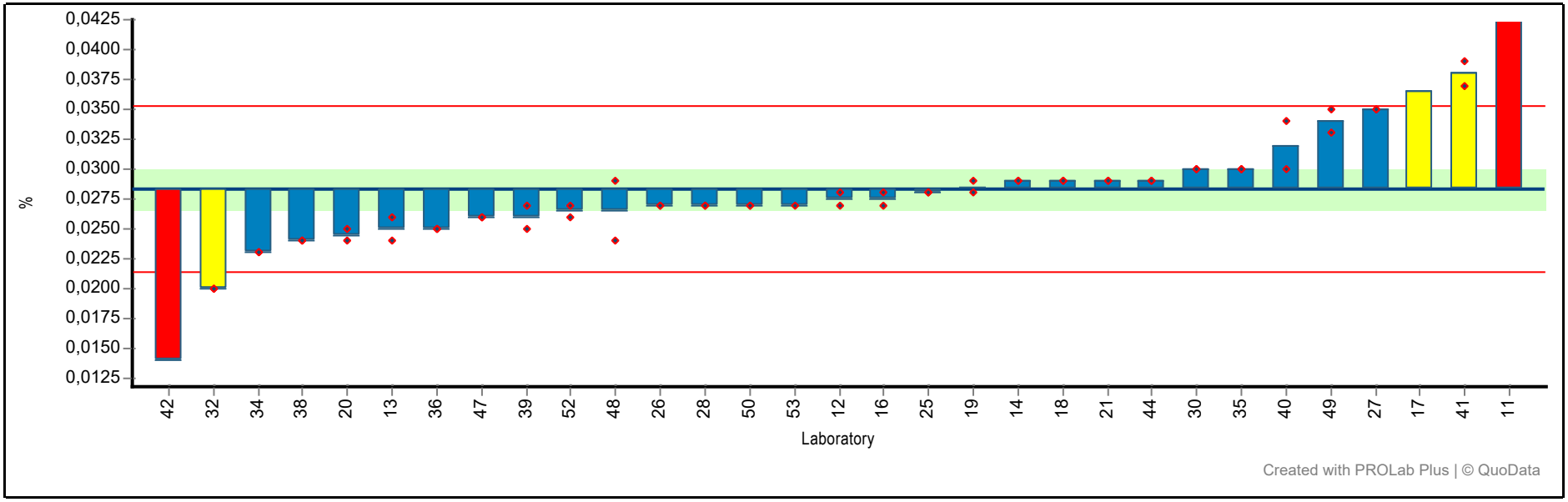
Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
11	0,050	0,050	0,050	0,000	0,7	XRF (fusion)	ISO 17025	
12	0,040	0,044	0,042	0,003	0,3	XRF (fusion)	no accredition	ISO 12677
13	0,051	0,051	0,051	0,000	0,8	Other Method	no accredition	combustion
14	0,211	0,211	0,211	0,000	9,6	Other Method	no accredition	S by IR method (Leco)
16	0,035	0,035	0,035	0,000	-0,1	XRF (fusion)	no accredition	DIN EN ISO 12677
17	0,119	0,119	0,119	0,000	4,6	XRF (pressed pellet)	no accredition	Info only
18	0,050	0,049	0,050	0,001	0,7	Other Method	no accredition	DIN EN 196-2
19	0,032	0,036	0,034	0,003	-0,1	Other Method	no accredition	combustion

RV_2024_01_Lime

Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
20	0,000	0,003	0,002	0,002	-1,9	XRF (fusion)	ISO 17025	
22	0,140	0,140	0,140	0,000	5,7	XRF (fusion)	no accredition	
25	0,049	0,048	0,049	0,001	0,7	XRF (fusion)	no accredition	
26	0,059	0,059	0,059	0,000	1,2	XRF (fusion)	no accredition	
27	0,023	0,020	0,021	0,002	-0,8	Other Method	ISO 17025	combustion
28	0,040	0,041	0,041	0,001	0,2	XRF (fusion)	no accredition	
30	1,090	1,080	1,085	0,007	57,8	XRF (fusion)	no accredition	
32	0,060	0,060	0,060	0,000	1,3	XRF (pressed pellet)	no accredition	EN 459-2; Info only
33	0,047	0,047	0,047	0,000	0,6	XRF (fusion)	no accredition	
34	0,026	0,026	0,026	0,000	-0,6	XRF (fusion)	no accredition	
35	0,020	0,020	0,020	0,000	-0,9	XRF (fusion)	no accredition	
36	0,035	0,034	0,035	0,001	-0,1	XRF (fusion)	ISO 17025	
37	0,009	0,008	0,009	0,001	-1,5	XRF (fusion)	ISO 17025	
38	0,039	0,040	0,040	0,001	0,2	XRF (fusion)	no accredition	
40	0,045	0,046	0,045	0,001	0,5	XRF (fusion)	no accredition	
41	0,043	0,038	0,040	0,004	0,2	XRF (fusion)	no accredition	
42	0,205	0,206	0,205	0,001	9,3	XRF (pressed pellet)	no accredition	Info only
43	0,037	0,034	0,036	0,002	-0,1	XRF (pressed pellet)	no accredition	Info only
44	0,028	0,028	0,028	0,000	-0,5	XRF (fusion)	no accredition	
47	0,034	0,031	0,033	0,002	-0,2	XRF (fusion)	no accredition	
49	0,047	0,046	0,046	0,001	0,6	XRF (fusion)	no accredition	
50	0,015	0,031	0,023	0,011	-0,7	Other Method	no accredition	ICP-OES
52	0,042	0,042	0,042	0,000	0,3	Other Method	no accredition	ICP-OES
53	0,040		0,040		0,2	XRF (pressed pellet)	no accredition	Info only

RV_2024_01_Lime

Sample:	**FLX-2002**	**Reprod. s.d.:**	**0,003 %**
Measurand:	**SrO**	**Repeat. s.d:**	**0,001 %**
Mean ± U(Mean):	**0,028 ± 0,002 %**	**Range of tolerance:**	**0,021 - 0,035 % (|z-score| <= 2,0)**
Number of laboratories in calculation:	**27**	**Statistical method:**	**Q/Hampel**



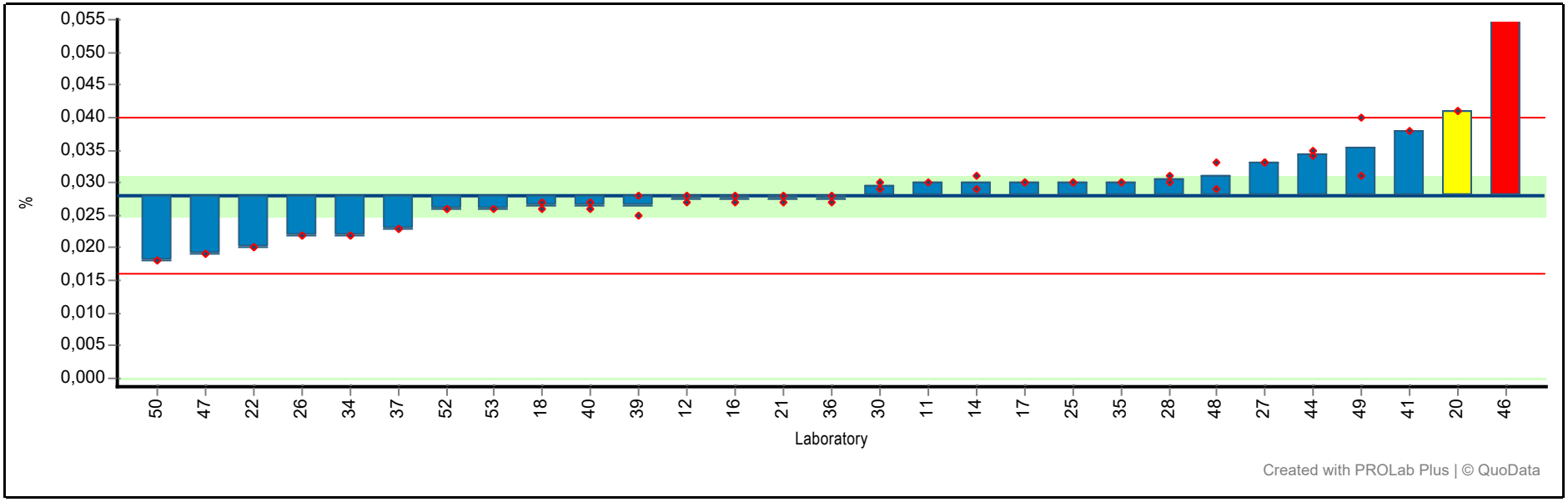
Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
11	0,050	0,050	0,050	0,000	6,2	XRF (fusion)	ISO 17025	
12	0,028	0,027	0,028	0,001	-0,2	XRF (fusion)	no accredition	ISO 12677
13	0,026	0,024	0,025	0,001	-1,0	XRF (fusion)	no accredition	
14	0,029	0,029	0,029	0,000	0,2	XRF (fusion)	no accredition	
16	0,028	0,027	0,028	0,001	-0,2	XRF (fusion)	no accredition	DIN EN ISO 12677
17	0,060	0,013	0,036	0,033	2,3	XRF (fusion)	no accredition	
18	0,029	0,029	0,029	0,000	0,2	Other Method	no accredition	ICP-OES, DIN EN ISO 16976
19	0,028	0,029	0,029	0,001	0,0	XRF (fusion)	no accredition	

RV_2024_01_Lime

Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
20	0,024	0,025	0,025	0,001	-1,1	XRF (fusion)	ISO 17025	
21	0,029	0,029	0,029	0,000	0,2	Other Method	ISO 17025	ICP-OES
25	0,028	0,028	0,028	0,000	-0,1	XRF (fusion)	no accredition	
26	0,027	0,027	0,027	0,000	-0,4	XRF (fusion)	no accredition	
27	0,035	0,035	0,035	0,000	1,9	XRF (fusion)	ISO 17025	
28	0,027	0,027	0,027	0,000	-0,4	XRF (fusion)	no accredition	
30	0,030	0,030	0,030	0,000	0,5	XRF (fusion)	no accredition	
32	0,020	0,020	0,020	0,000	-2,4	XRF (pressed pellet)	no accredition	EN 459-2; Info only
34	0,023	0,023	0,023	0,000	-1,5	XRF (fusion)	no accredition	
35	0,030	0,030	0,030	0,000	0,5	XRF (fusion)	no accredition	
36	0,025	0,025	0,025	0,000	-1,0	XRF (fusion)	ISO 17025	
38	0,024	0,024	0,024	0,000	-1,3	XRF (pressed pellet)	no accredition	Info only
39	0,025	0,027	0,026	0,001	-0,7	XRF (fusion)	no accredition	
40	0,034	0,030	0,032	0,003	1,0	XRF (fusion)	no accredition	
41	0,039	0,037	0,038	0,001	2,8	XRF (fusion)	no accredition	
42	0,014	0,014	0,014	0,000	-4,1	XRF (pressed pellet)	no accredition	Info only
44	0,029	0,029	0,029	0,000	0,2	XRF (fusion)	no accredition	
47	0,026	0,026	0,026	0,000	-0,7	XRF (fusion)	no accredition	
48	0,024	0,029	0,027	0,004	-0,5	XRF (fusion)	ISO 17025	
49	0,033	0,035	0,034	0,001	1,6	XRF (fusion)	no accredition	
50	0,027	0,027	0,027	0,000	-0,4	Other Method	ISO 17025	ICP-OES
52	0,026	0,027	0,026	0,001	-0,5	Other Method	no accredition	ICP-OES
53	0,027		0,027		-0,4	XRF (pressed pellet)	no accredition	Info only

RV_2024_01_Lime

Sample:	**FLX-2002**	**Reprod. s.d.:**	**0,006 %**
Measurand:	**TiO2**	**Repeat. s.d:**	**0,001 %**
Mean ± U(Mean):	**0,028 ± 0,003 %**	**Range of tolerance:**	**0,016 - 0,040 % (|z-score| <= 2,0)**
Number of laboratories in calculation:	**27**	**Statistical method:**	**Q/Hampel**



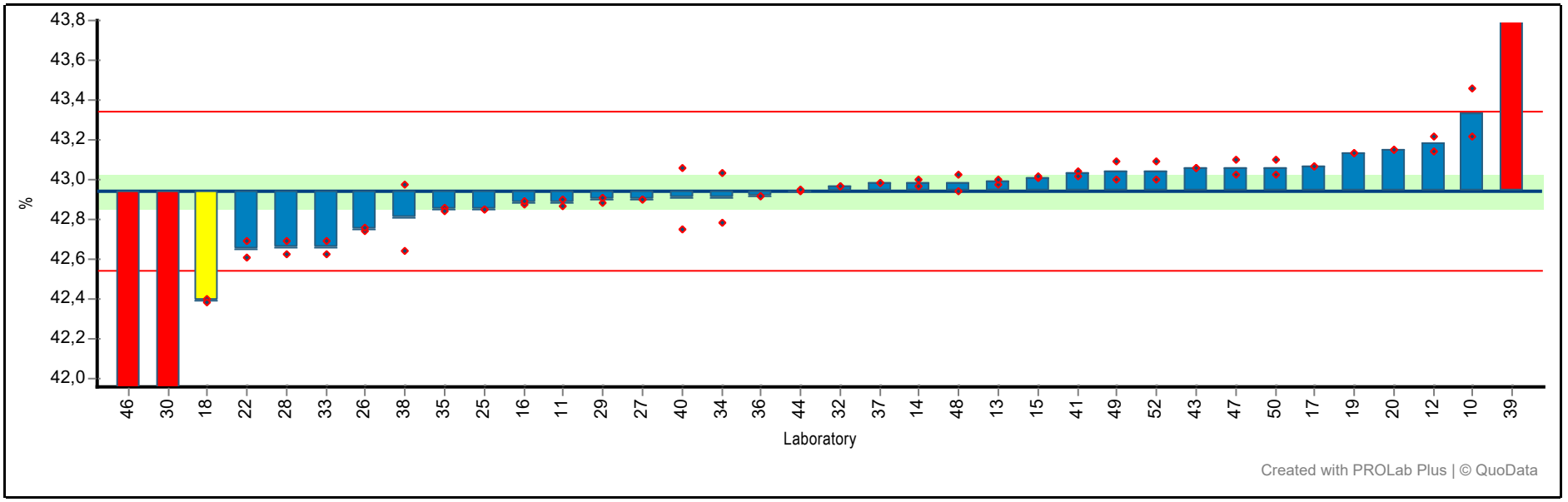
Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
11	<0,010	0,030	0,030		0,3	XRF (fusion)	ISO 17025	Info only
12	0,027	0,028	0,028	0,001	-0,1	XRF (fusion)	no accredition	ISO 12677
14	0,031	0,029	0,030	0,001	0,3	XRF (fusion)	no accredition	
16	0,028	0,027	0,028	0,001	-0,1	XRF (fusion)	no accredition	DIN EN ISO 12677
17	0,030	0,030	0,030	0,000	0,3	XRF (fusion)	no accredition	
18	0,027	0,026	0,026	0,001	-0,3	Other Method	no accredition	ICP-OES, DIN EN ISO 16976
20	0,041	0,041	0,041	0,000	2,2	XRF (fusion)	ISO 17025	
21	0,028	0,027	0,028	0,001	-0,1	Other Method	ISO 17025	ICP-OES

RV_2024_01_Lime

Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
22	0,020	0,020	0,020	0,000	-1,3	XRF (fusion)	no accredition	
25	0,030	0,030	0,030	0,000	0,3	XRF (fusion)	no accredition	
26	0,022	0,022	0,022	0,000	-1,0	XRF (fusion)	no accredition	
27	0,033	0,033	0,033	0,000	0,8	XRF (fusion)	ISO 17025	
28	0,030	0,031	0,030	0,001	0,4	XRF (fusion)	no accredition	
30	0,030	0,029	0,029	0,001	0,2	XRF (fusion)	no accredition	
34	0,022	0,022	0,022	0,000	-1,0	XRF (fusion)	no accredition	
35	0,030	0,030	0,030	0,000	0,3	XRF (fusion)	no accredition	
36	0,028	0,027	0,028	0,001	-0,1	XRF (fusion)	ISO 17025	
37	0,023	0,023	0,023	0,000	-0,8	XRF (fusion)	ISO 17025	
39	0,028	0,025	0,027	0,002	-0,3	XRF (fusion)	no accredition	
40	0,026	0,027	0,026	0,001	-0,3	XRF (fusion)	no accredition	
41		0,038	0,038		1,7	XRF (fusion)	no accredition	
44	0,035	0,034	0,035	0,001	1,1	XRF (fusion)	no accredition	
46	0,059	0,061	0,060	0,001	5,3	XRF (fusion)	no accredition	
47	0,019	0,019	0,019	0,000	-1,5	XRF (fusion)	no accredition	
48	0,029	0,033	0,031	0,003	0,5	XRF (fusion)	ISO 17025	
49	0,031	0,040	0,036	0,006	1,2	XRF (fusion)	no accredition	
50	0,018	0,018	0,018	0,000	-1,7	Other Method	no accredition	ICP-OES
52	0,026	0,026	0,026	0,000	-0,3	Other Method	no accredition	ICP-OES
53	0,026		0,026		-0,3	XRF (pressed pellet)	no accredition	Info only

RV_2024_01_Lime

Sample:	**FLX-2002**	**Reprod. s.d.:**	**0,199 %**
Measurand:	**Loss on Ignition**	**Repeat. s.d:**	**0,031 %**
Mean ± U(Mean):	**42,943 ± 0,081 %**	**Range of tolerance:**	**42,545 - 43,340 % (|z-score| <= 2,0)**
Number of laboratories in calculation:	**35**	**Statistical method:**	**Q/Hampel**



Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
10	43,215	43,457	43,336	0,171	2,0	Other Method	no accredition	LOI @1050°C
11	42,900	42,870	42,885	0,021	-0,3	Other Method	ISO 17025	LOI @1050°C
12	43,220	43,140	43,180	0,057	1,2	Other Method	no accredition	LOI @1050°C
13	42,977	43,002	42,989	0,018	0,2	Other Method	no accredition	LOI @1000°C
14	42,970	43,000	42,985	0,021	0,2	Other Method	no accredition	LOI @1050°C
15	43,008	43,016	43,012	0,006	0,3	Other Method	no accredition	LOI @1050°C
16	42,871	42,889	42,880	0,013	-0,3	Other Method	no accredition	DIN 51081; LOI @1050°C
17	43,070	43,070	43,070	0,000	0,6	Other Method	no accredition	DIN EN 196-2; Gravimtery

RV_2024_01_Lime

Lab code	Conc. 1	Conc. 2	Lab mean	s.d.	z-score	Analytical method	Accreditation	Comment
18	42,398	42,384	42,391	0,010	-2,8	Other Method	no accredition	DIN EN 196-2; LOI @950°C
19	43,130	43,130	43,130	0,000	0,9	Other Method	no accredition	LOI @1050°C
20	43,150	43,150	43,150	0,000	1,0	Other Method	ISO 17025	LOI @1050°C
22	42,610	42,690	42,650	0,057	-1,5	XRF (fusion)	no accredition	LOI @1050°C
25	42,854	42,854	42,854	0,000	-0,4	Other Method	no accredition	DIN EN 196-2; LOI@950°C
26	42,744	42,760	42,752	0,011	-1,0	XRF (fusion)	no accredition	LOI @1050°C
27	42,900	42,898	42,899	0,001	-0,2	Other Method	ISO 17025	LOI @1050°C
28	42,629	42,694	42,662	0,046	-1,4	XRF (fusion)	no accredition	LOI @1050°C
29	42,886	42,908	42,897	0,016	-0,2	Other Method	no accredition	LOI @1050°C
30	41,940	41,900	41,920	0,028	-5,1	Other Method	no accredition	LOI @950°C
32	42,970	42,970	42,970	0,000	0,1	XRF (pressed pellet)	no accredition	EN 459-2; Info only
33	42,629	42,694	42,662	0,046	-1,4	XRF (fusion)	no accredition	LOI @1050°C
34	42,784	43,031	42,907	0,175	-0,2	Other Method	no accredition	LOI @1050°C
35	42,860	42,840	42,850	0,014	-0,5	Other Method	no accredition	LOI @1050°C
36	42,920	42,920	42,920	0,000	-0,1	Other Method	ISO 17025	LOI 1050°C
37	42,980	42,980	42,980	0,000	0,2	Other Method	no accredition	gravimetric
38	42,978	42,643	42,811	0,237	-0,7	Other Method	no accredition	LOI 1050°C
39	43,820	43,822	43,821	0,001	4,4	Other Method	no accredition	LOI 1050°C
40	42,750	43,060	42,905	0,219	-0,2	Other Method	no accredition	LOI 1050°C
41	43,040	43,020	43,030	0,014	0,4	Other Method	no accredition	LOI 1050°C
43	43,060	43,060	43,060	0,000	0,6	Other Method	no accredition	Info only
44	42,940	42,950	42,945	0,007	0,0	Other Method	no accredition	LOI 1050°C
46	41,920	41,910	41,915	0,007	-5,2	Other Method	no accredition	LOI 1050°C
47	43,021	43,099	43,060	0,055	0,6	Other Method	no accredition	LOI 950°C
48	42,942	43,029	42,986	0,062	0,2	Other Method	ISO 17025	LOI 1050°C
49	43,000	43,090	43,045	0,064	0,5	Other Method	no accredition	LOI @ 950°C
50	43,021	43,099	43,060	0,055	0,6	Other Method	ISO 17025	LOI 950°C
52	43,000	43,090	43,045	0,064	0,5	Other Method	no accredition	LOI @ 950°C

RV_2024_01_Lime

z-scores (per sample)

Sample: FLX-2002

Lab code	Al2O3	BaO	CaO	Fe2O3	K2O	MgO	Mn2O3	Na2O	P2O5	SiO2	SO3	SrO	TiO2	Loss on Ignition
10	-1,2		-1,1	-0,1	0,4	-0,9		0,5		1,3				2,0
11	1,0		0,2	0,8	-3,2	-1,9		0,3	-0,3	0,8	0,7	6,2	0,3	-0,3
12	-0,8		-0,3	-1,9	0,5	0,5	0,8		-0,3	-0,3	0,3	-0,2	-0,1	1,2
13	-0,3	0,6	-0,1	-0,2	0,3	-0,3	3,8	-0,4		-0,5	0,8	-1,0		0,2
14	-0,3	0,4	-0,6	1,2	-2,2	-0,4	-0,3	-1,0	0,3	-0,6	9,6	0,2	0,3	0,2
15	-0,6		-1,5	0,3		-0,7				-0,8				0,3
16	-0,4	-0,6	0,1	-0,5	0,4	0,1	0,2	0,2	-0,6	0,4	-0,1	-0,2	-0,1	-0,3
17	-1,9	0,3	-0,8	15,9	-1,7	-0,8	5,8	-1,4	1,5	-1,4	4,6	2,3	0,3	0,6
18	1,2	-0,4	-0,1	0,4	8,9	-0,5	0,0	1,0	-0,8	11,6	0,7	0,2	-0,3	-2,8
19	0,8	1,3		1,1	0,5	0,2	1,2	-0,7		0,4	-0,1	0,0		0,9
20	1,5		1,1	-2,0	0,6	0,7	-0,3	1,2	-0,5	0,5	-1,9	-1,1	2,2	1,0
21	-0,4	-0,4	-1,6	-0,3	0,5	-1,2	-0,3	-0,4	-0,3	-0,2		0,2	-0,1	
22	-2,3		2,4	0,5	24,7	-12,5	-0,9		48,7	0,5	5,7		-1,3	-1,5
25	0,1		1,4	0,4	-3,9	1,1	0,2	-2,2	1,0	-0,2	0,7	-0,1	0,3	-0,4
26	-0,8		0,7	0,9	0,3	1,1		1,7	0,4	-0,2	1,2	-0,4	-1,0	-1,0
27	0,1		0,5	0,4	0,7	0,2	19,8		0,4	-0,2	-0,8	1,9	0,8	-0,2
28	0,4	-0,9	1,8	0,1	0,5	1,9	-0,4	0,2	0,1	0,0	0,2	-0,4	0,4	-1,4
29	-5,6		-0,8	0,8		-1,3				-0,8				-0,2
30	-0,6		1,0	0,3	-3,0	0,2			0,3	1,4	57,8	0,5	0,2	-5,1
32	5,5		1,6	1,1	0,4	0,2		1,7		5,0	1,3	-2,4		0,1
33	0,3		1,3	-0,9		-0,2	-0,1		0,1	-0,4	0,6			-1,4
34	0,9	21,3	-0,1	-2,4	-4,4	3,7	-1,2		0,3	1,5	-0,6	-1,5	-1,0	-0,2
35	0,5		-0,1	0,5	0,1	0,0	0,0	0,0	-0,3	-3,2	-0,9	0,5	0,3	-0,5
36	-0,6		0,1	-0,4	0,5	-0,1	-0,6			-0,6	-0,1	-1,0	-0,1	-0,1
37	0,1		0,3	0,4	-0,5	-0,2	0,0		0,8	0,6	-1,5		-0,8	0,2
38	0,4	1,1	0,3	1,9		1,5	0,3	2,0		0,8	0,2	-1,3		-0,7
39	0,5		-1,0	-3,0	-0,1	-0,2	0,2		2,6			-0,7	-0,3	4,4
40	0,4	0,2	0,5	0,0	0,8	0,5	-1,5	-0,9	0,3	0,6	0,5	1,0	-0,3	-0,2
41	1,4		-0,2	-0,4	0,3	0,0	1,2		-0,1	0,0	0,2	2,8	1,7	0,4
42	22,1	0,9	-1,6		2,7	-3,1		337,0	95,8		9,3	-4,1		

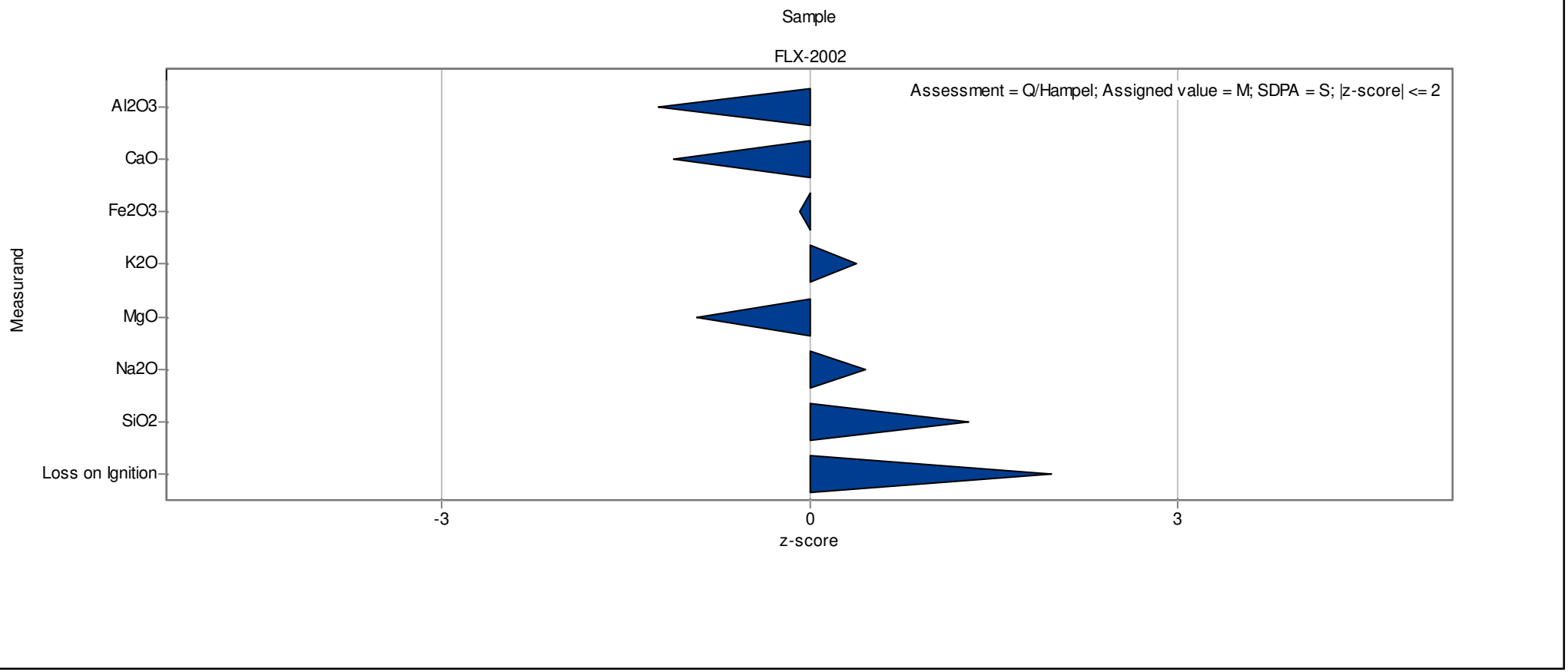
RV_2024_01_Lime

Lab code	Al2O3	BaO	CaO	Fe2O3	K2O	MgO	Mn2O3	Na2O	P2O5	SiO2	SO3	SrO	TiO2	Loss on Ignition
43	2,9		0,5	1,0	0,3	-3,3	2,5			-0,4	-0,1			0,6
44	0,9	0,8	0,0	1,1	-0,9	-0,3	1,5	-0,4	1,2	-1,1	-0,5	0,2	1,1	0,0
46	-0,5		4,6	1,0	-0,3	-5,6	-0,6		-1,4	-1,3			5,3	-5,2
47	-0,2	-0,4	-0,5	-1,2	0,2	0,0	-0,9	-0,8	-1,2	-0,7	-0,2	-0,7	-1,5	0,6
48	0,2		-0,4	-0,2	0,0	-0,3	0,6		-0,6	-0,6		-0,5	0,5	0,2
49	6,0		-2,1	0,2	-0,5	1,2	1,7	0,9	-0,5	0,6	0,6	1,6	1,2	0,5
50	0,6	-0,4	-0,6	0,0	1,1	-0,5	-0,3	0,3		0,3	-0,7	-0,4	-1,7	0,6
52	-2,3	-0,6	-0,1	-2,7	3,4	-4,3	-0,6	0,8	-1,4	3,1	0,3	-0,5	-0,3	0,5
53	1,3		0,0	-2,6	1,3	-0,9	-0,6	0,3	0,8	1,7	0,2	-0,4	-0,3	
55	3,8		-0,7	1,7		-1,2				-0,6				

RV_2024_01_Lime

Laboratory chart of z-scores

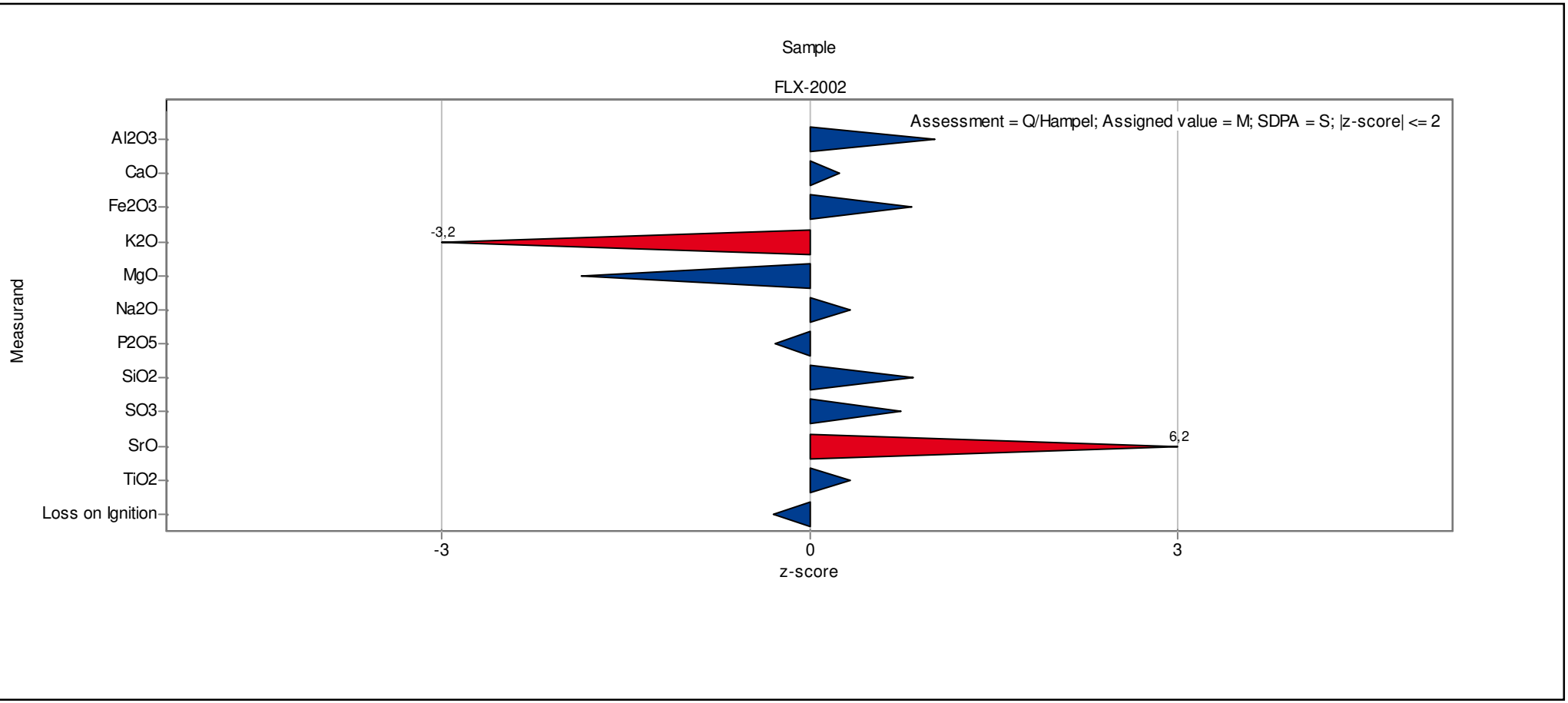
Laboratory: 10



RV_2024_01_Lime

Laboratory chart of z-scores

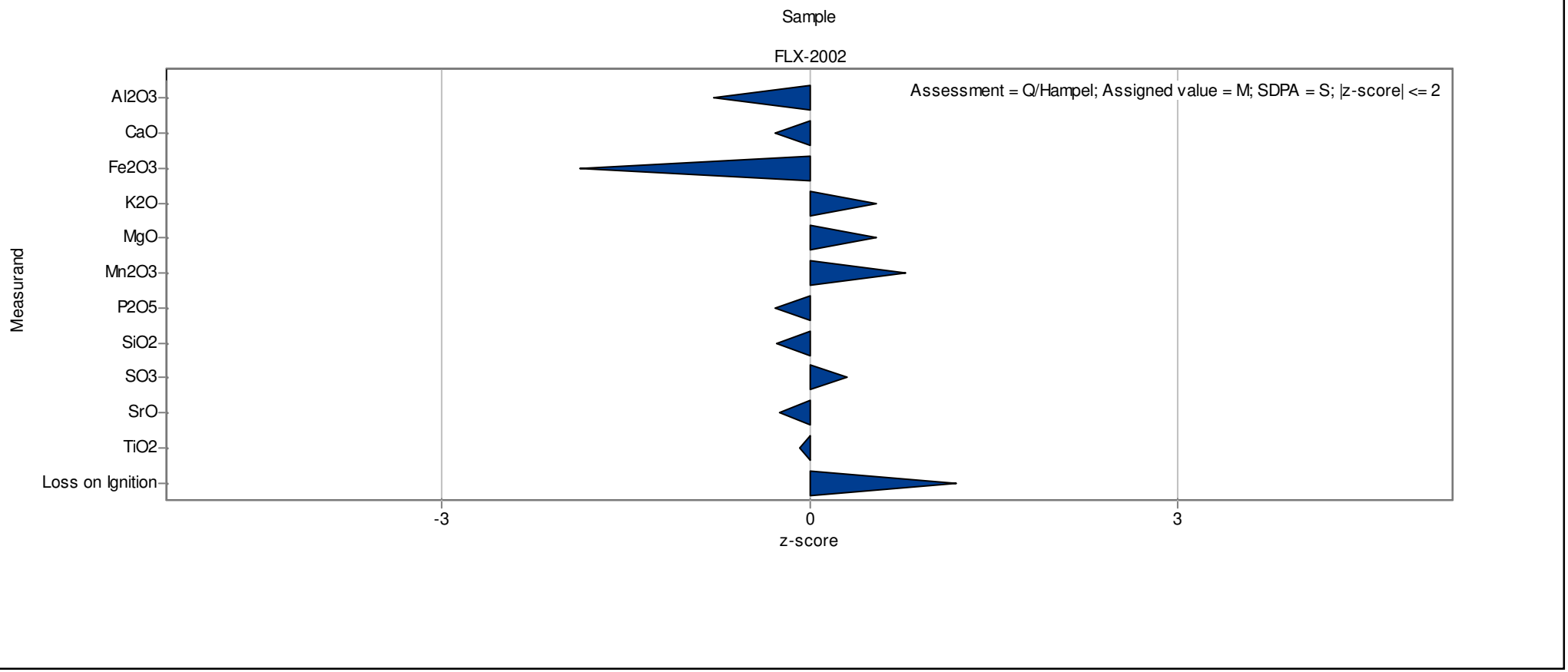
Laboratory: 11



RV_2024_01_Lime

Laboratory chart of z-scores

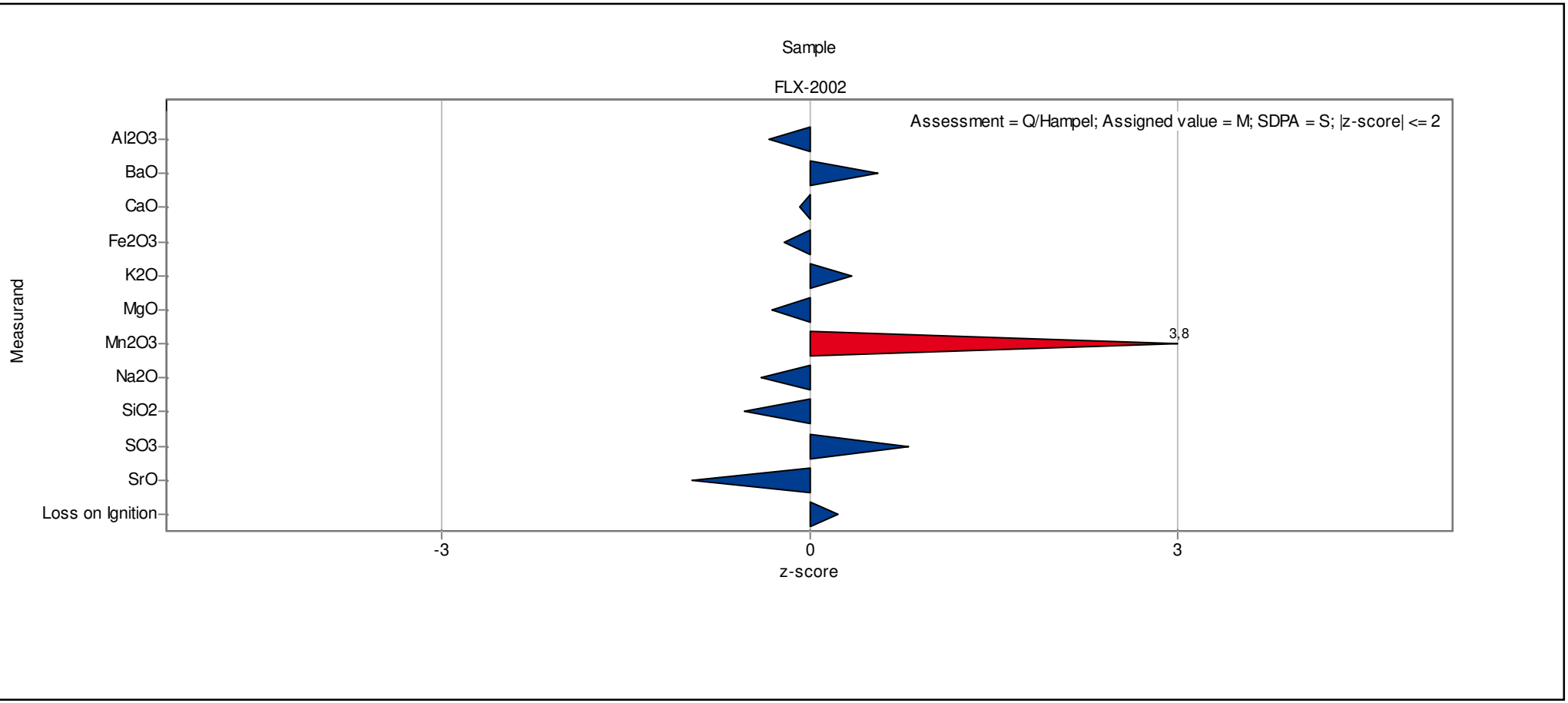
Laboratory: 12



RV_2024_01_Lime

Laboratory chart of z-scores

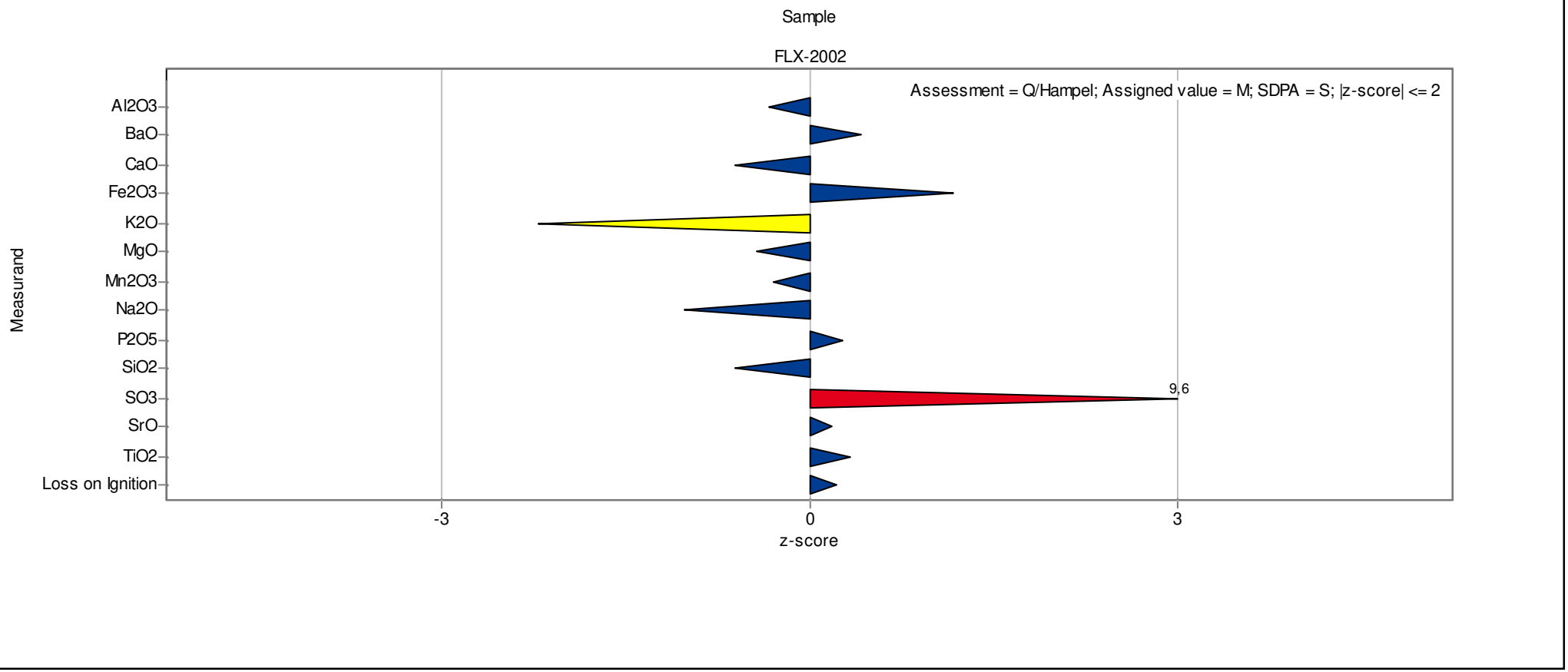
Laboratory: 13



RV_2024_01_Lime

Laboratory chart of z-scores

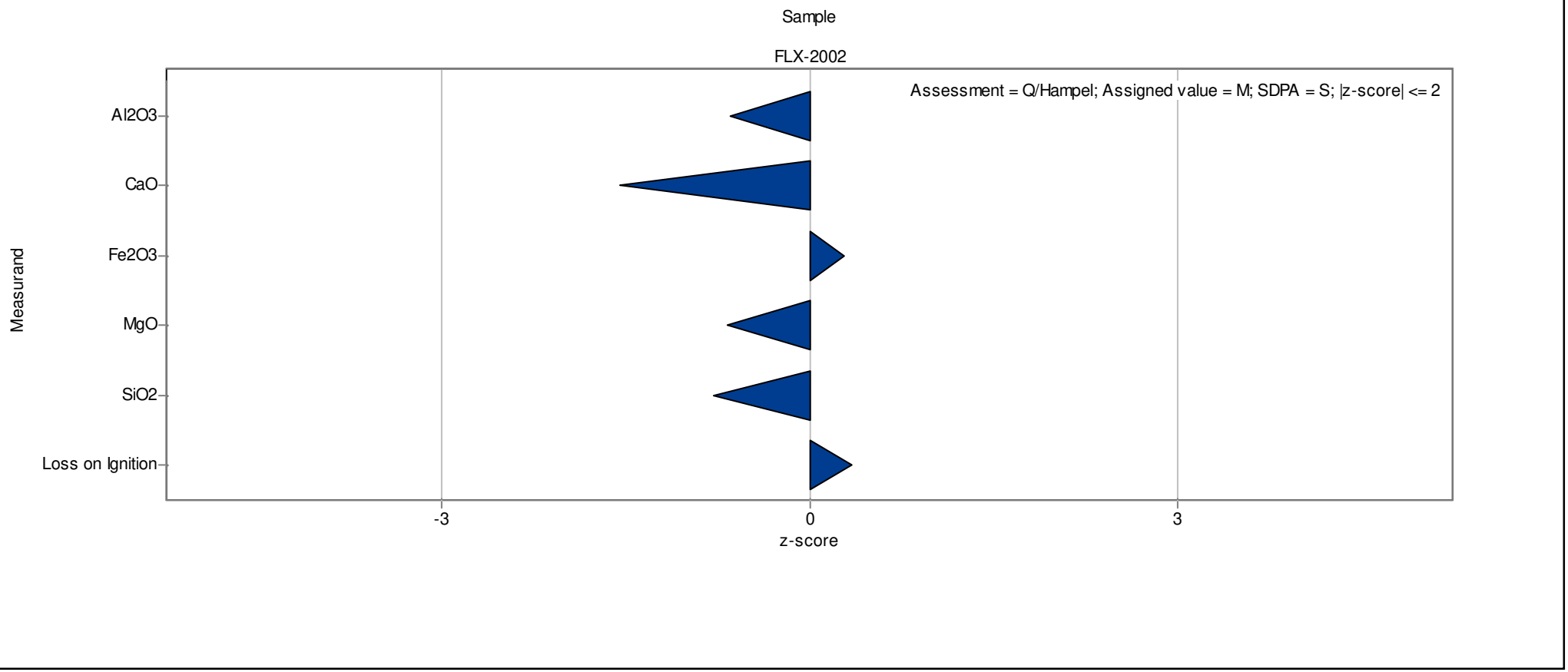
Laboratory: 14



RV_2024_01_Lime

Laboratory chart of z-scores

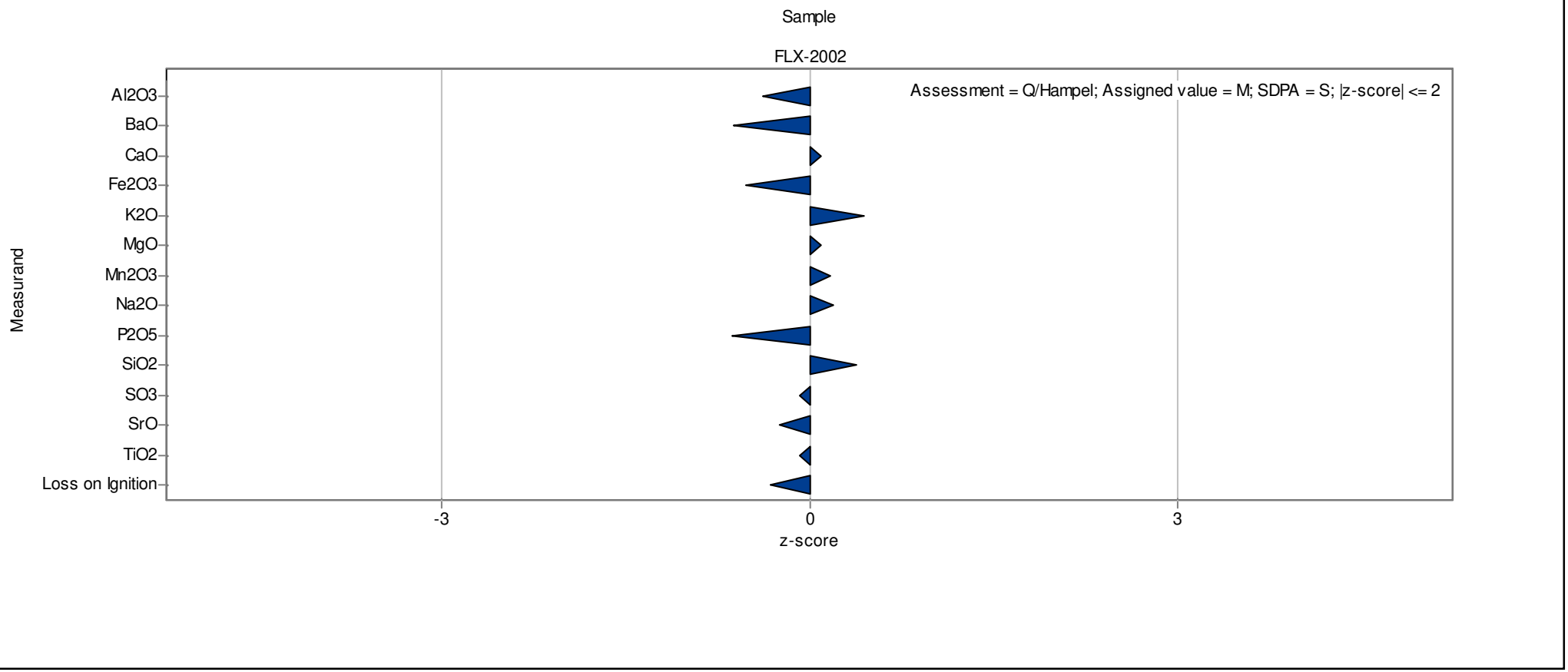
Laboratory: 15



RV_2024_01_Lime

Laboratory chart of z-scores

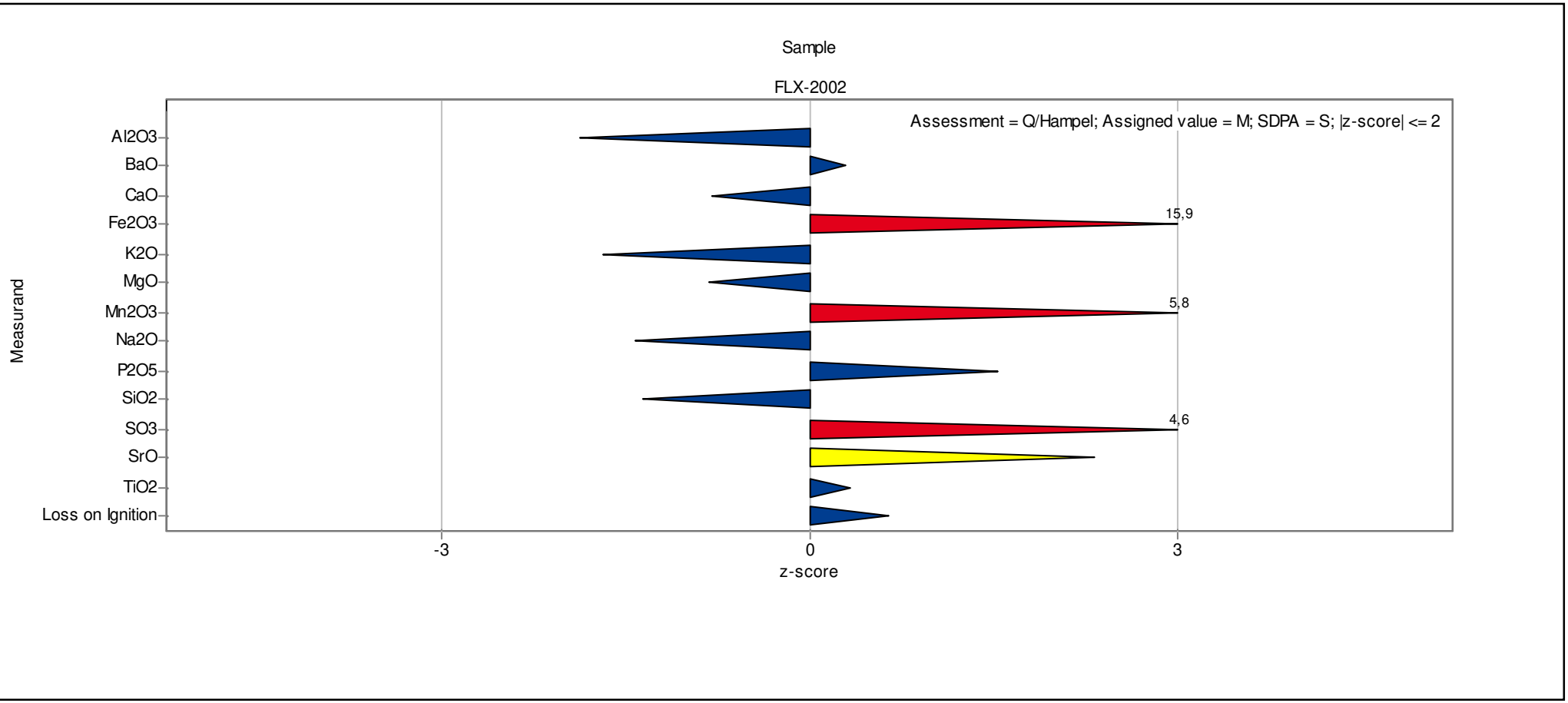
Laboratory: 16



RV_2024_01_Lime

Laboratory chart of z-scores

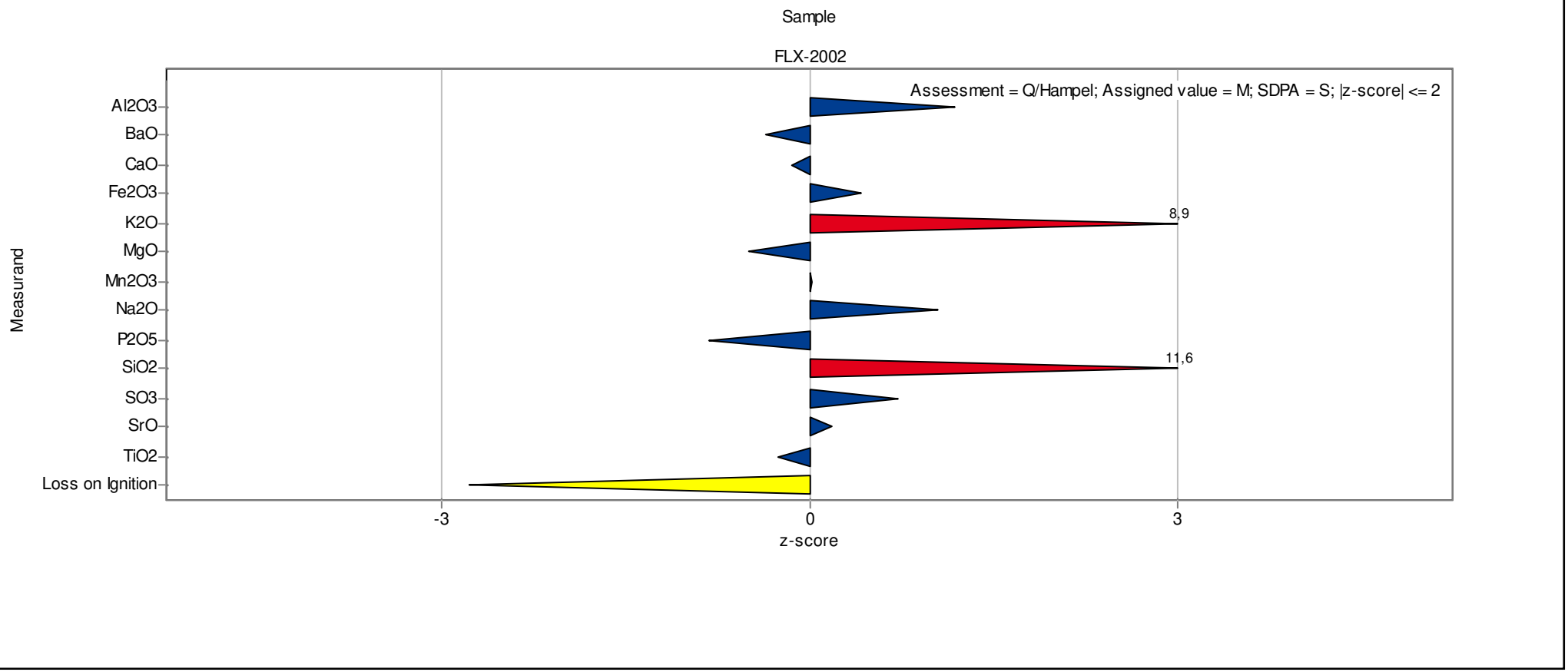
Laboratory: 17



RV_2024_01_Lime

Laboratory chart of z-scores

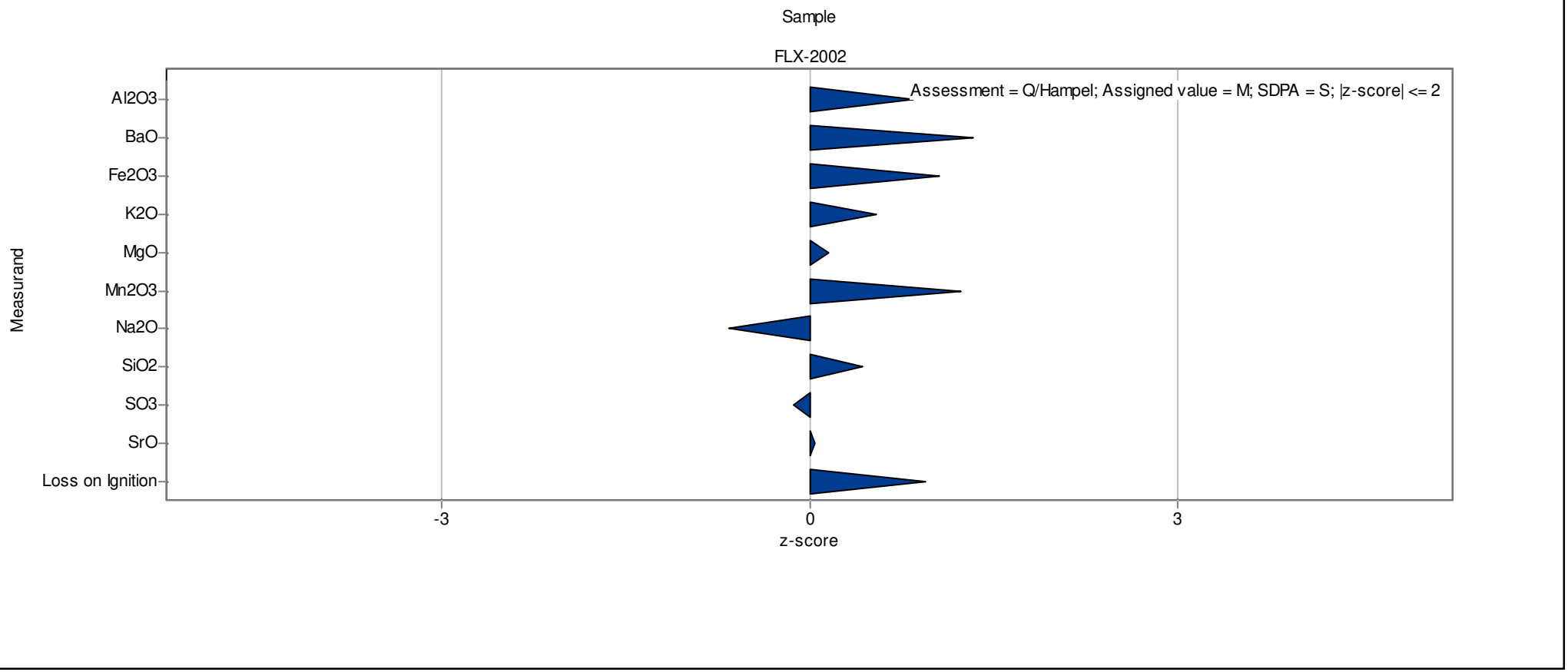
Laboratory: 18



RV_2024_01_Lime

Laboratory chart of z-scores

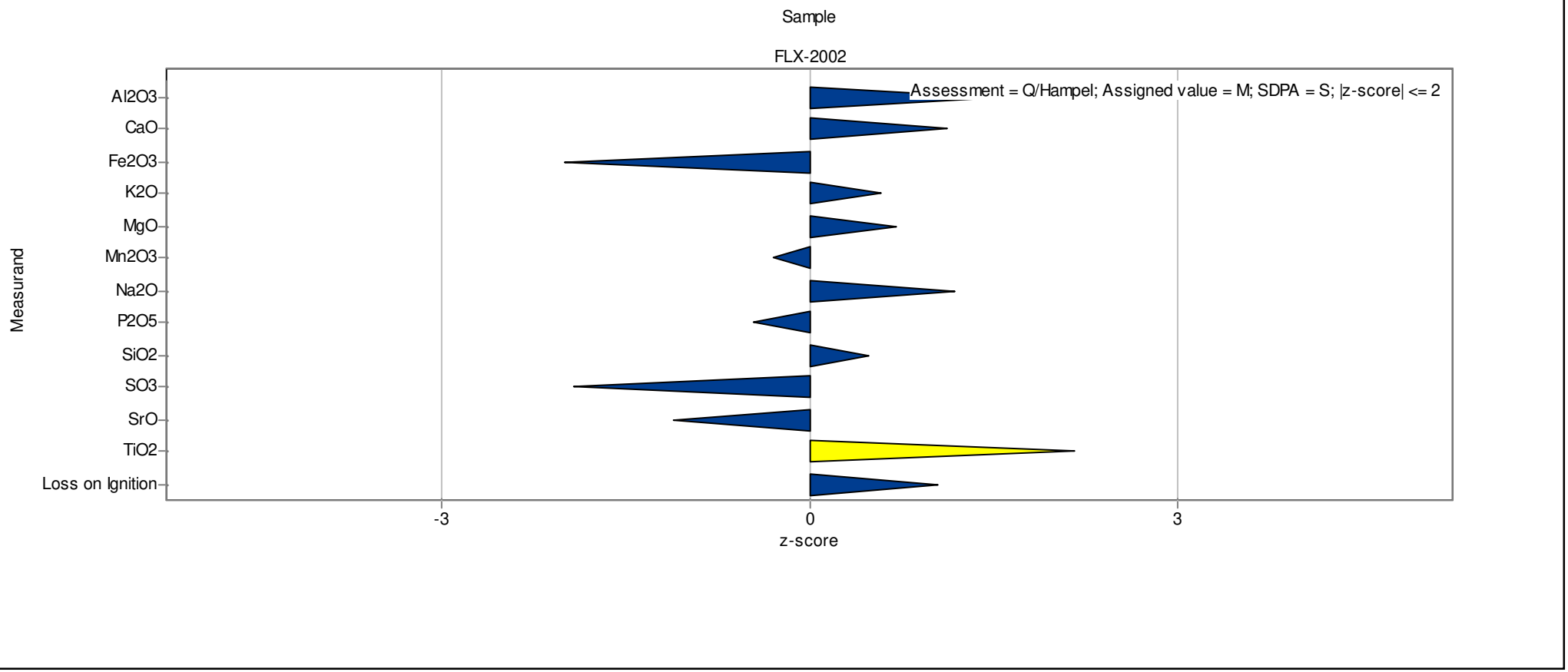
Laboratory: 19



RV_2024_01_Lime

Laboratory chart of z-scores

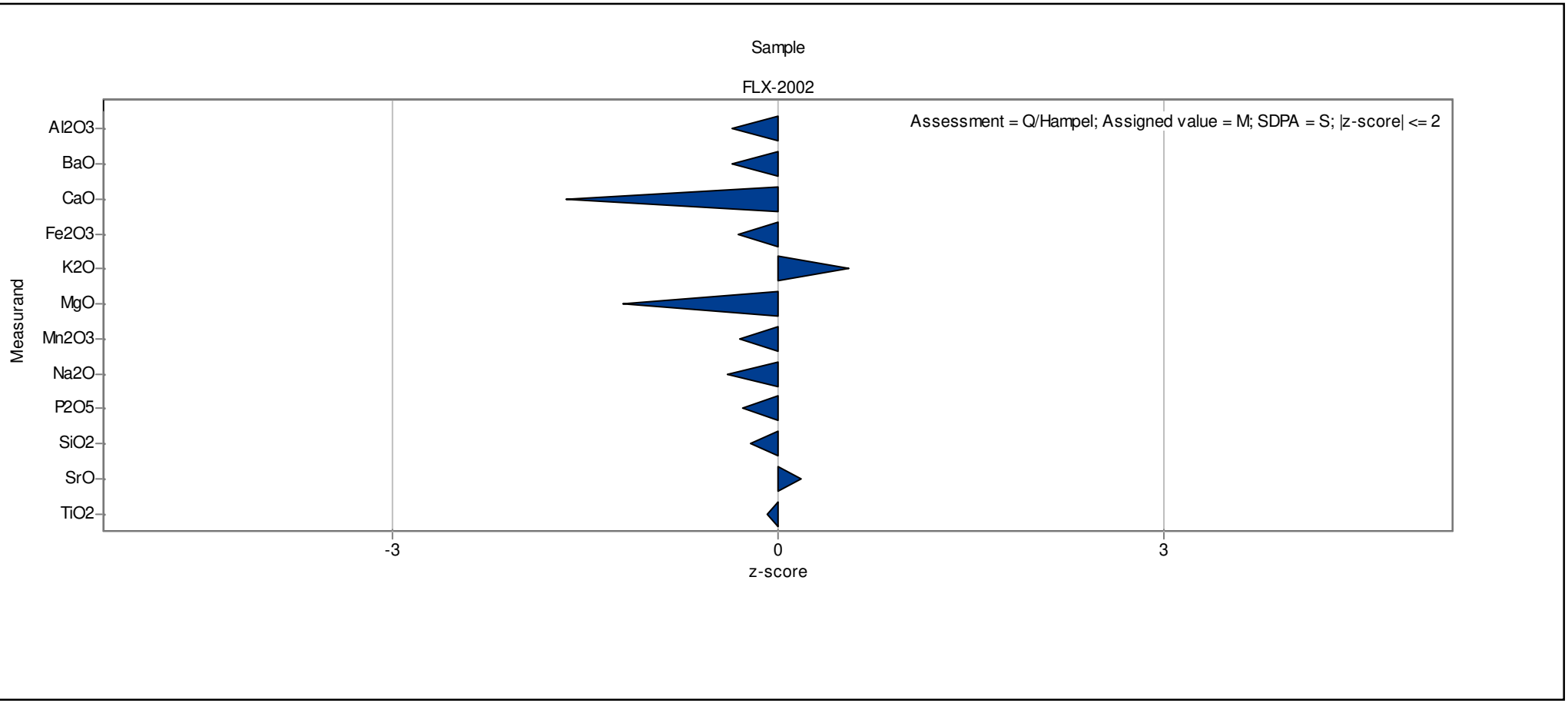
Laboratory: 20



RV_2024_01_Lime

Laboratory chart of z-scores

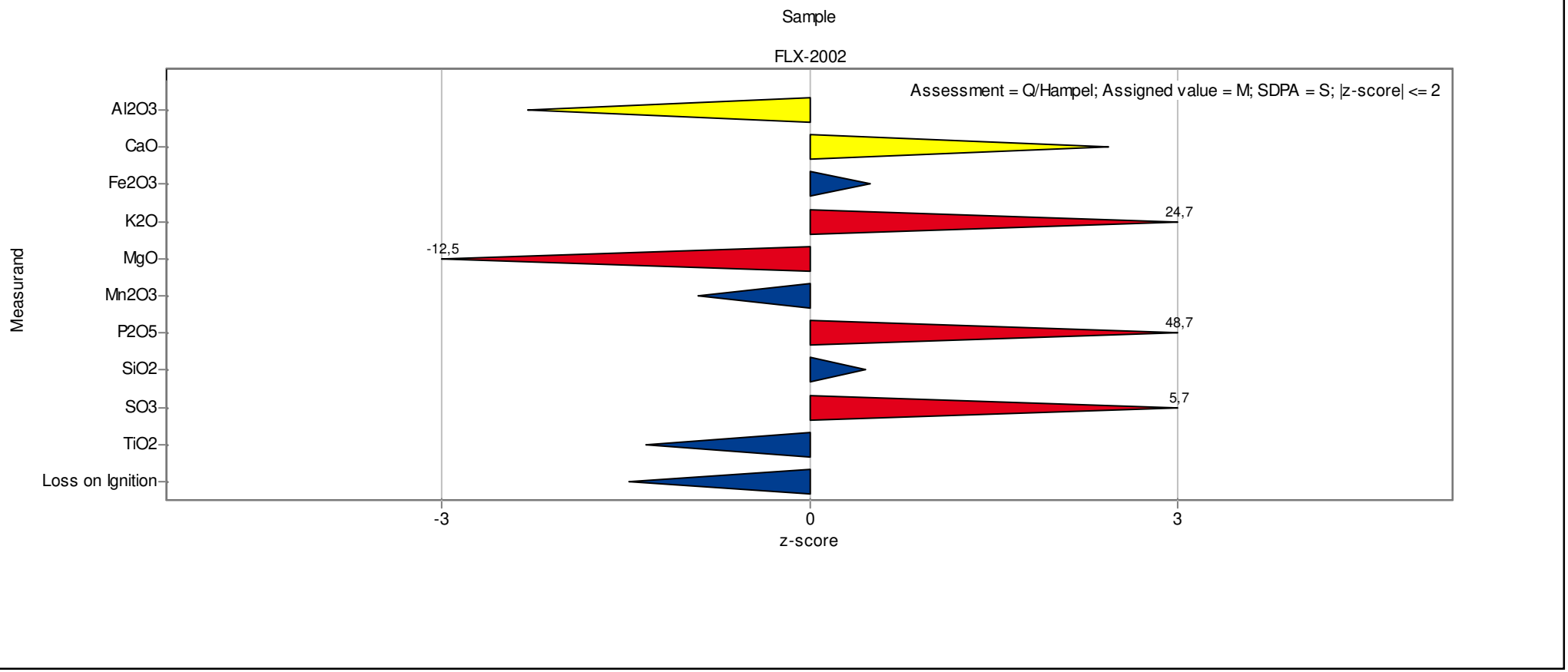
Laboratory: 21



RV_2024_01_Lime

Laboratory chart of z-scores

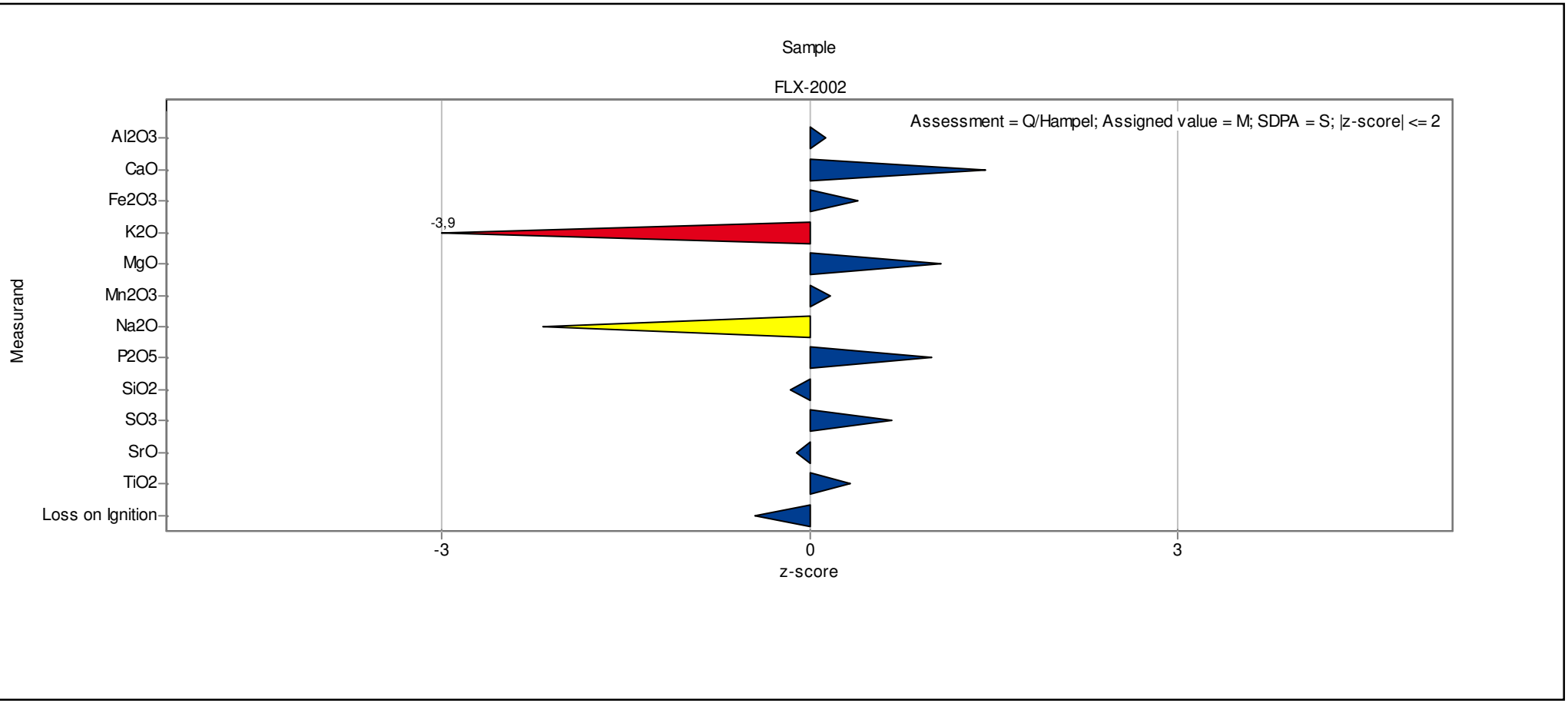
Laboratory: 22



RV_2024_01_Lime

Laboratory chart of z-scores

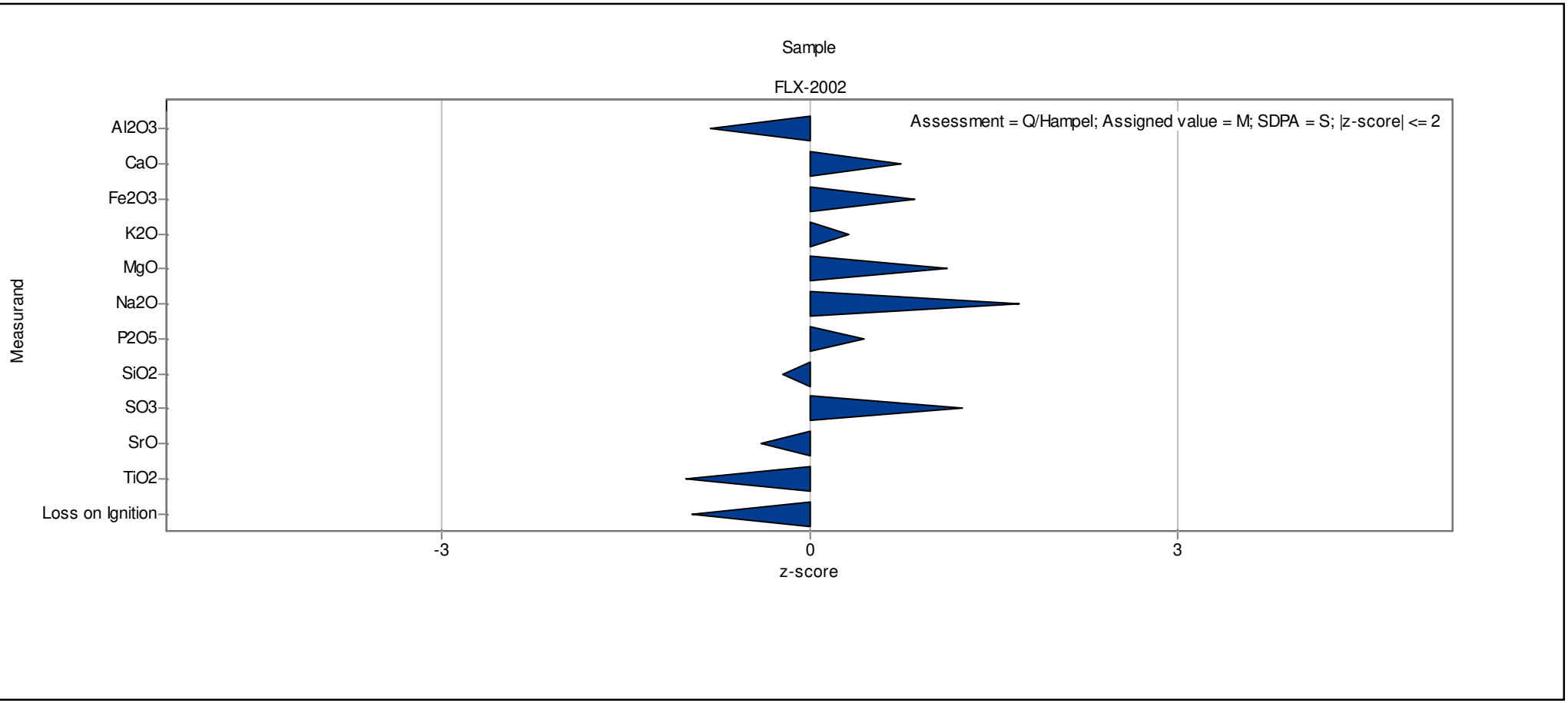
Laboratory: 25



RV_2024_01_Lime

Laboratory chart of z-scores

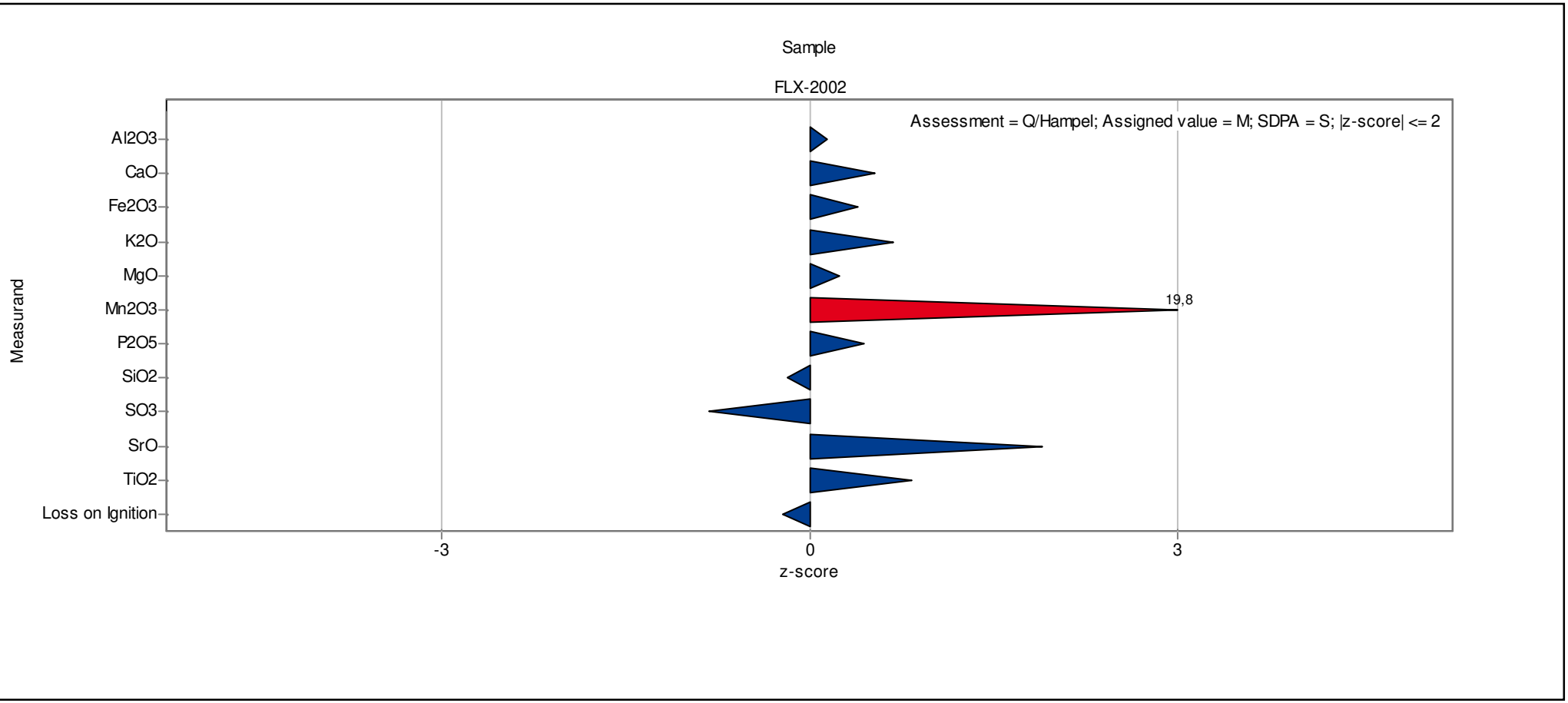
Laboratory: 26



RV_2024_01_Lime

Laboratory chart of z-scores

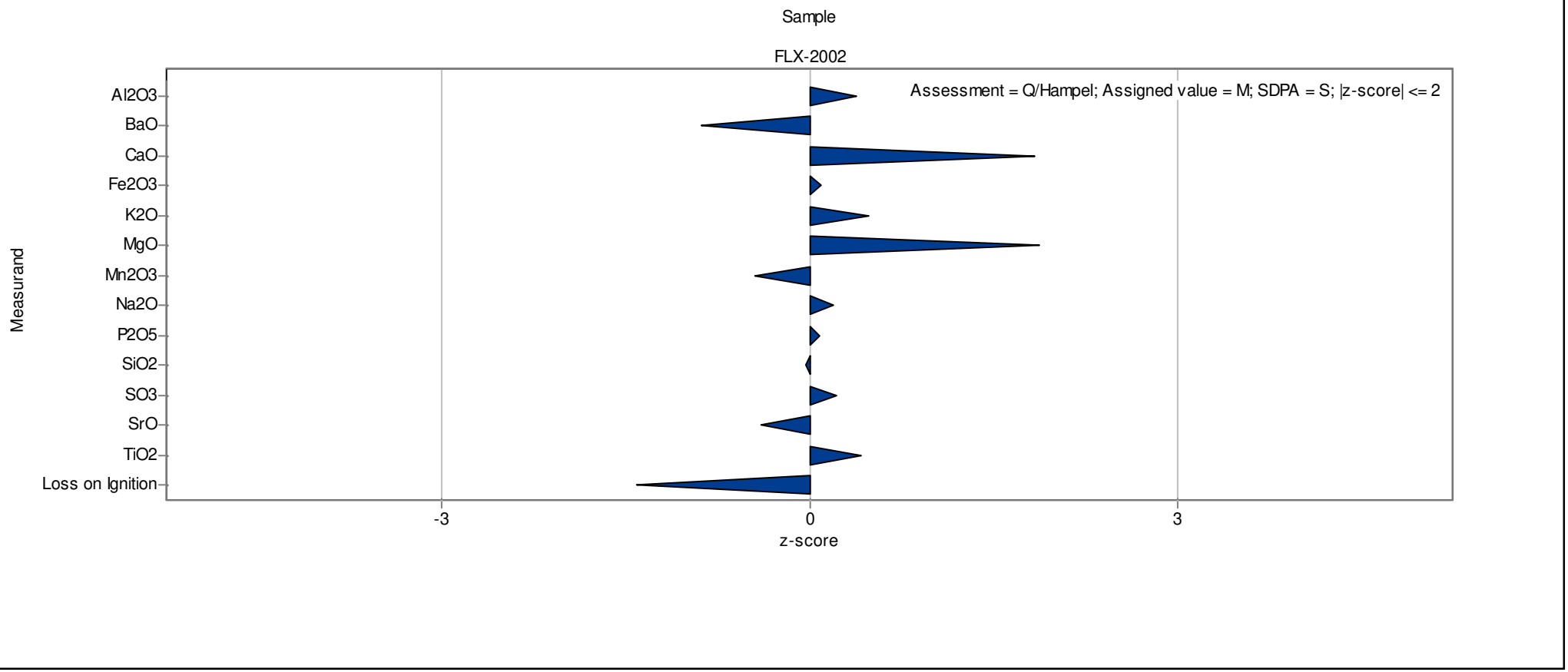
Laboratory: 27



RV_2024_01_Lime

Laboratory chart of z-scores

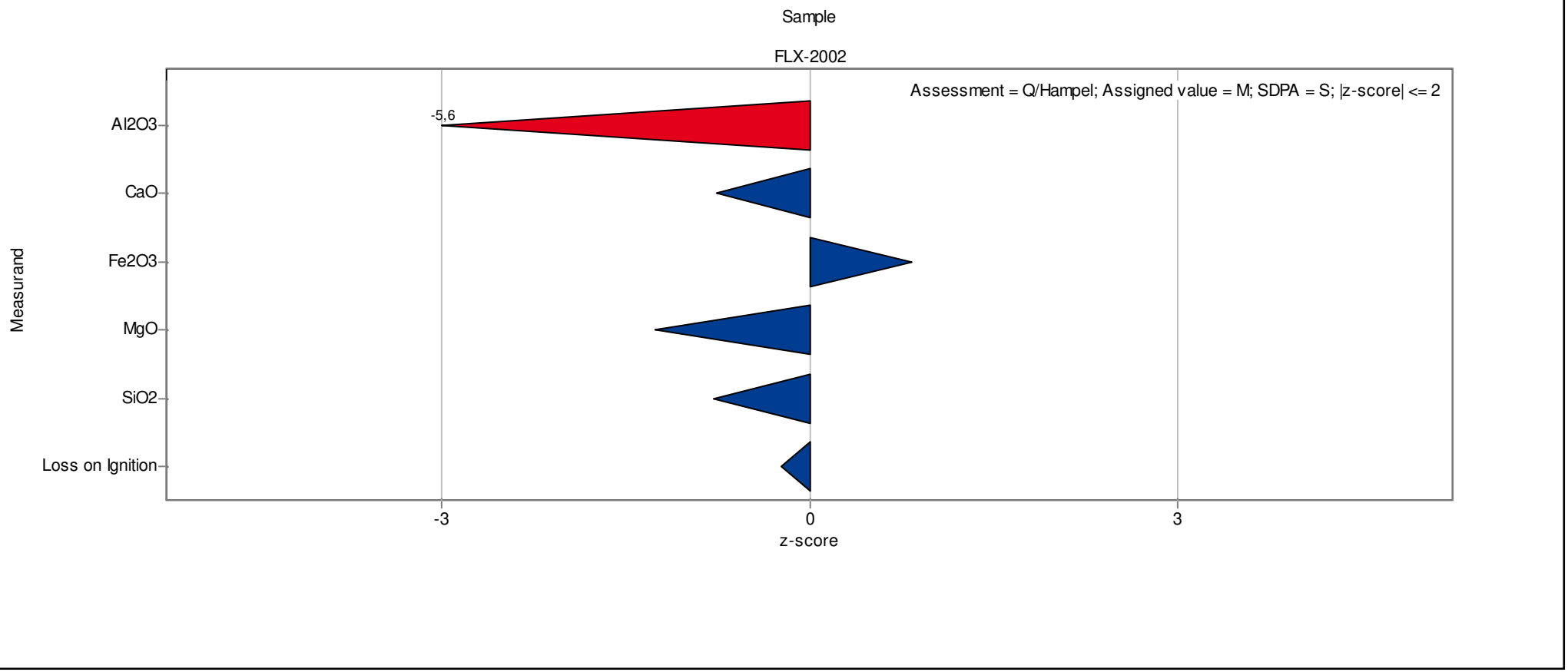
Laboratory: 28



RV_2024_01_Lime

Laboratory chart of z-scores

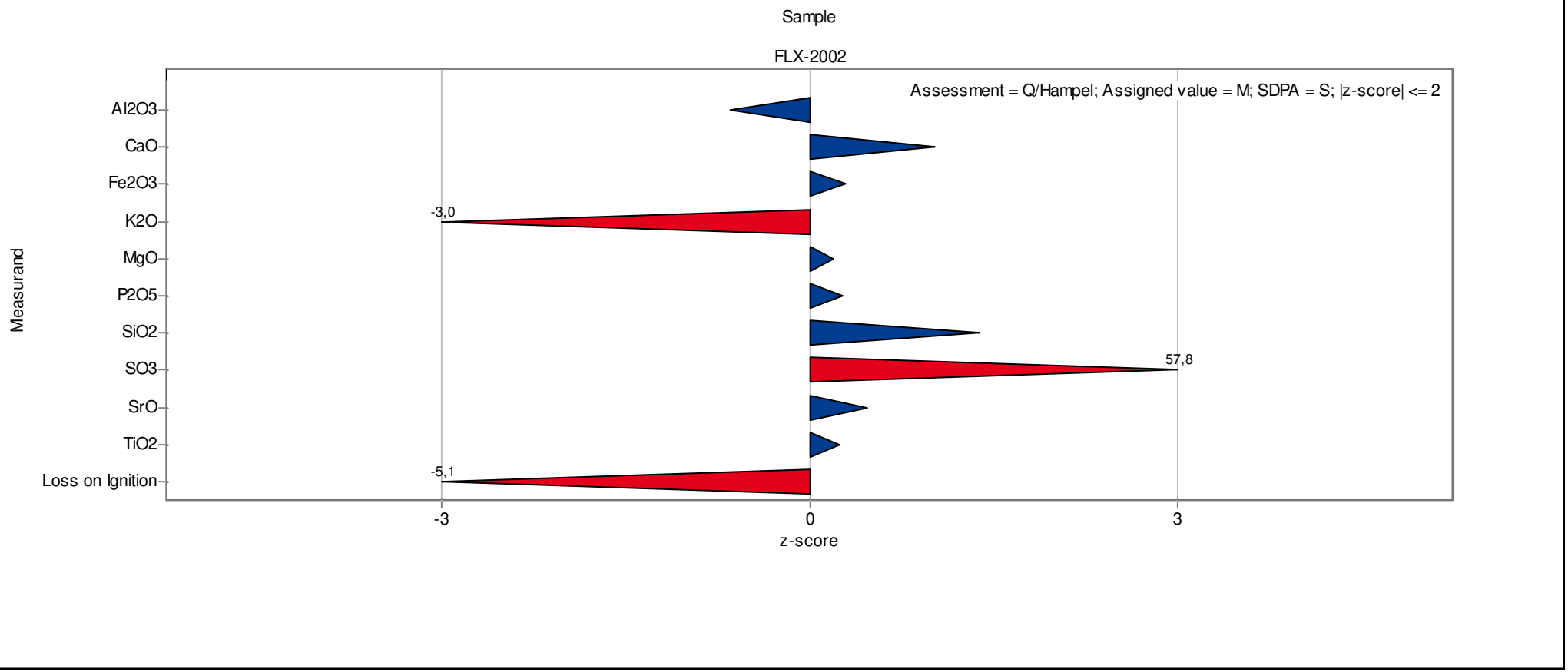
Laboratory: 29



RV_2024_01_Lime

Laboratory chart of z-scores

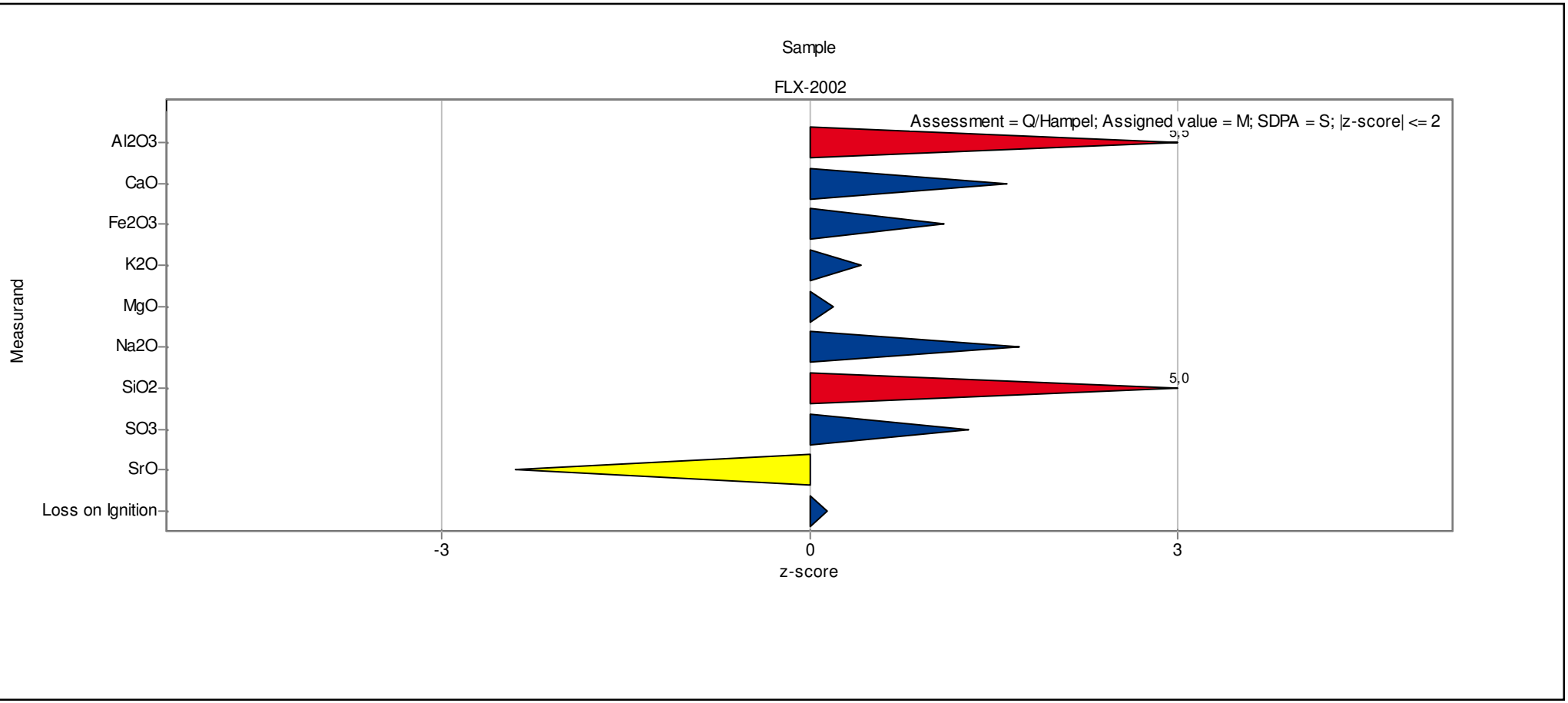
Laboratory: 30



RV_2024_01_Lime

Laboratory chart of z-scores

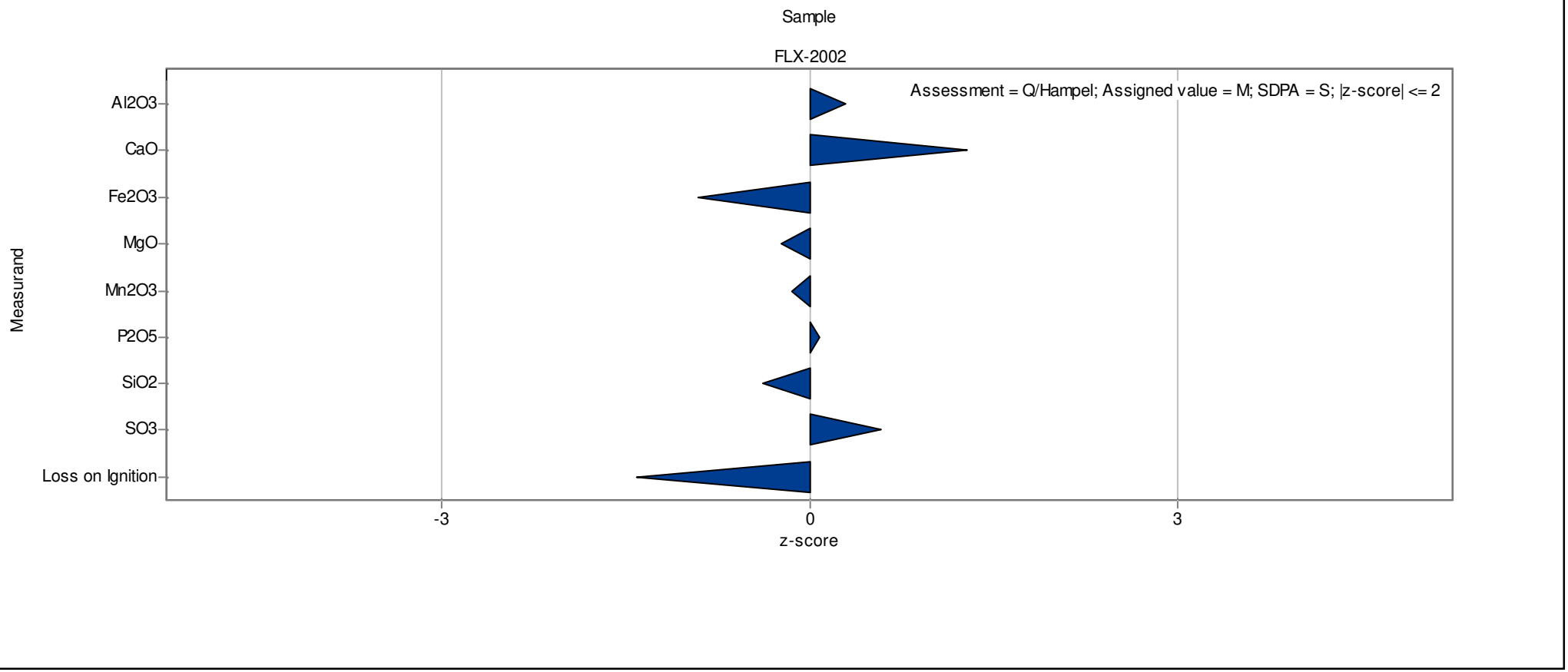
Laboratory: 32



RV_2024_01_Lime

Laboratory chart of z-scores

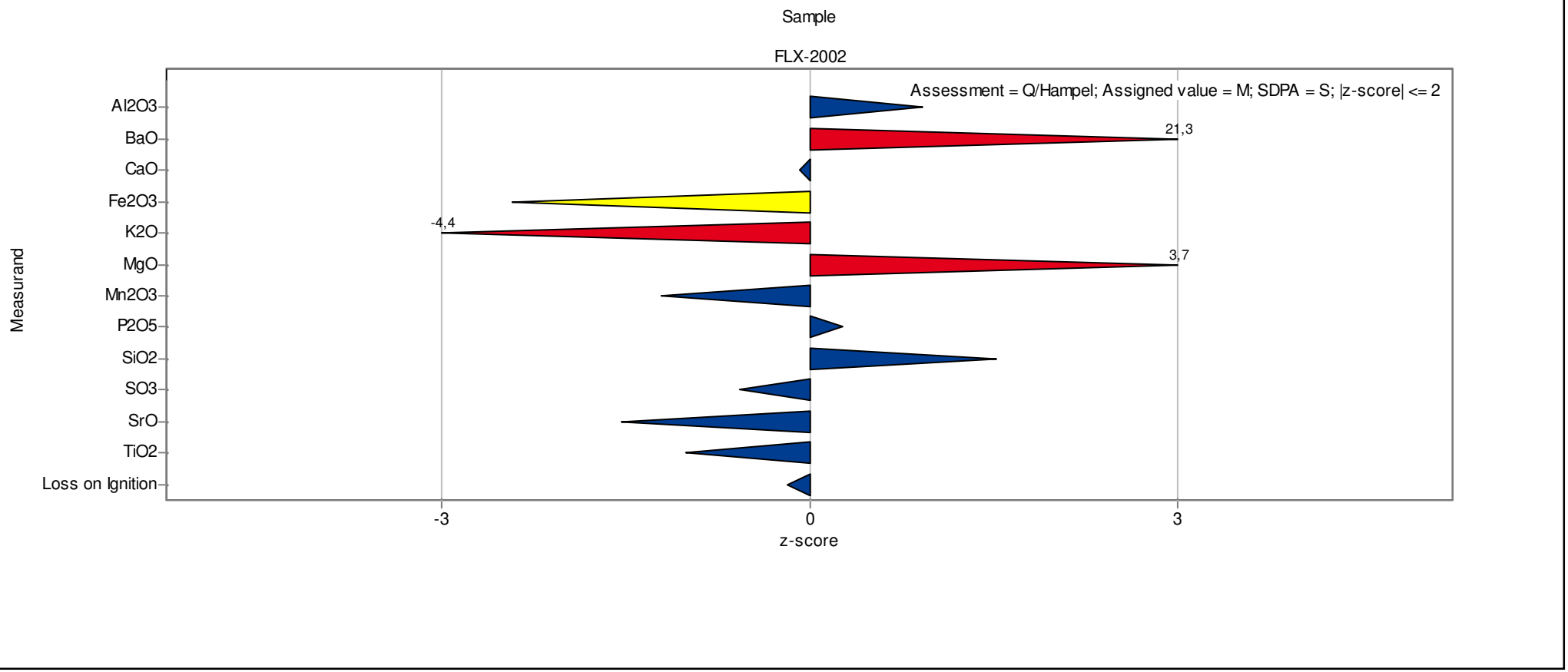
Laboratory: 33



RV_2024_01_Lime

Laboratory chart of z-scores

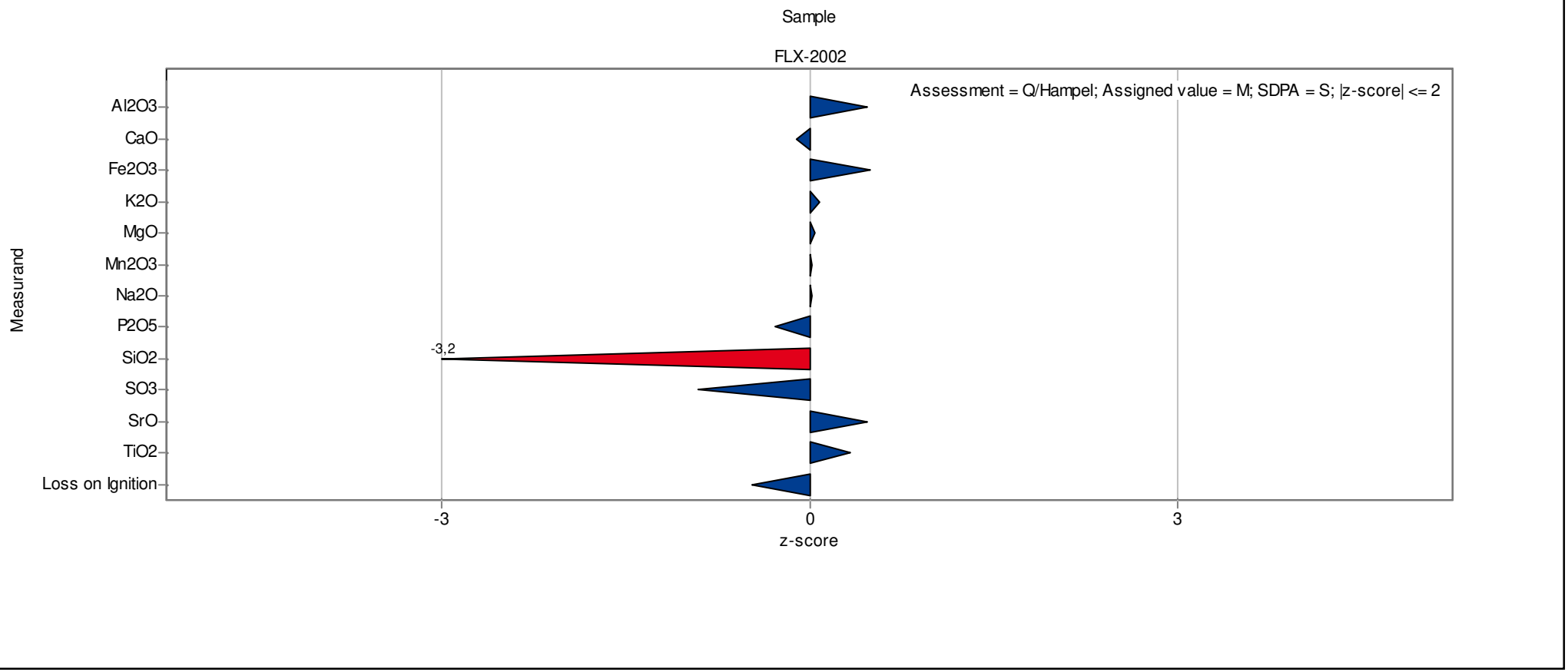
Laboratory: 34



RV_2024_01_Lime

Laboratory chart of z-scores

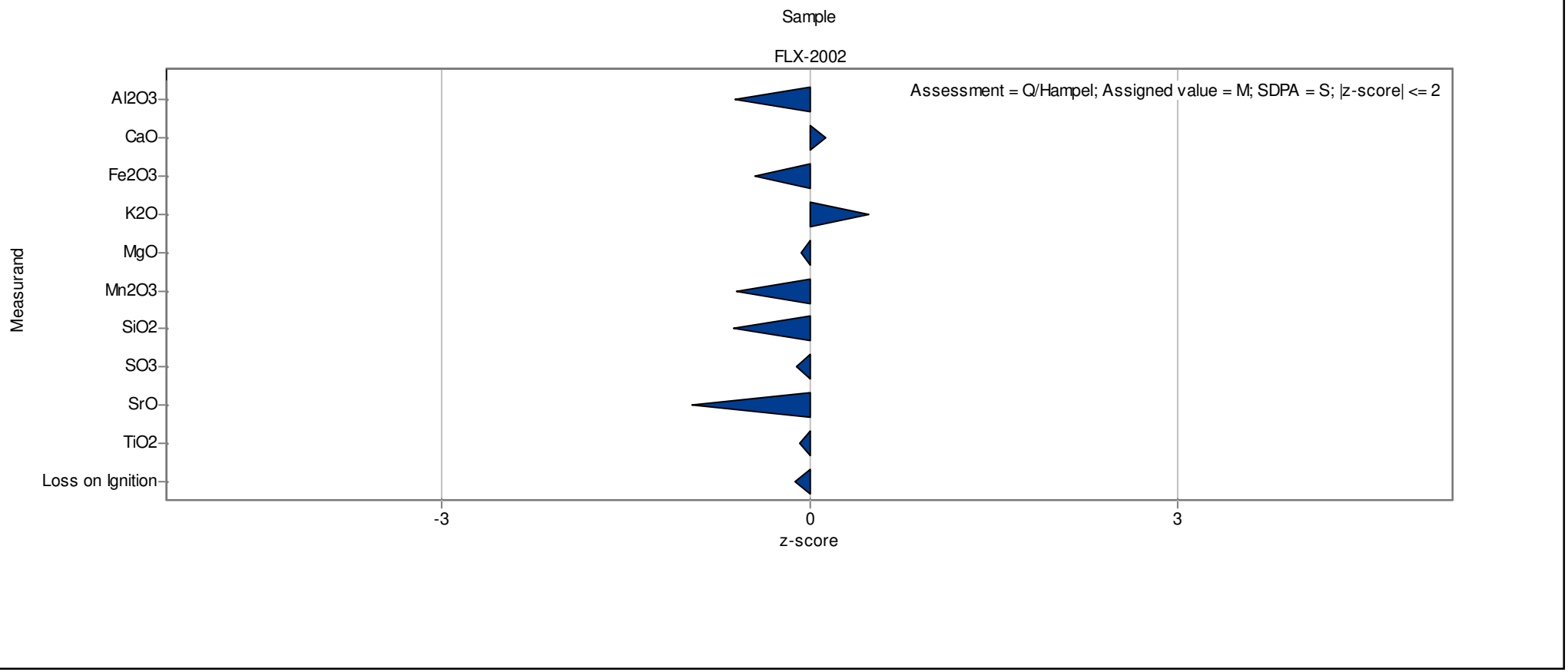
Laboratory: 35



RV_2024_01_Lime

Laboratory chart of z-scores

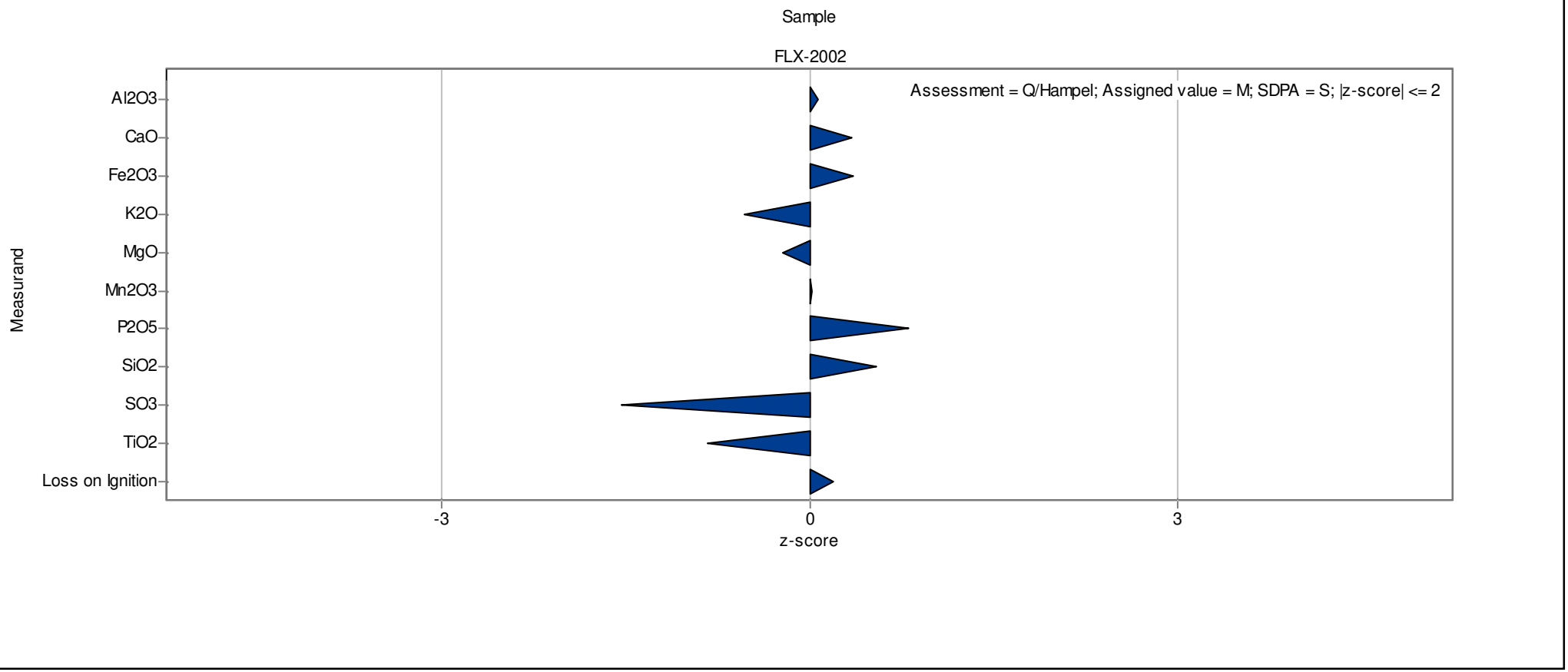
Laboratory: 36



RV_2024_01_Lime

Laboratory chart of z-scores

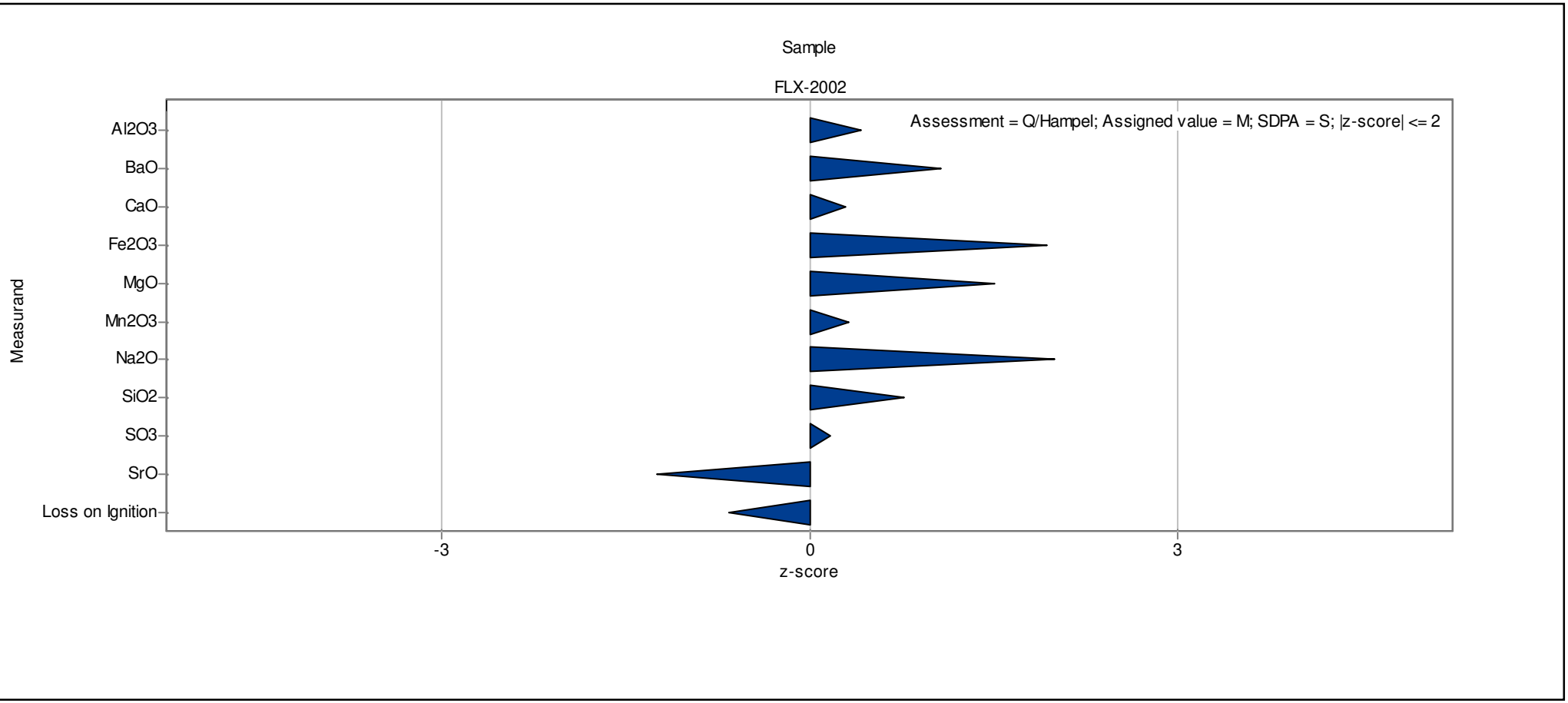
Laboratory: 37



RV_2024_01_Lime

Laboratory chart of z-scores

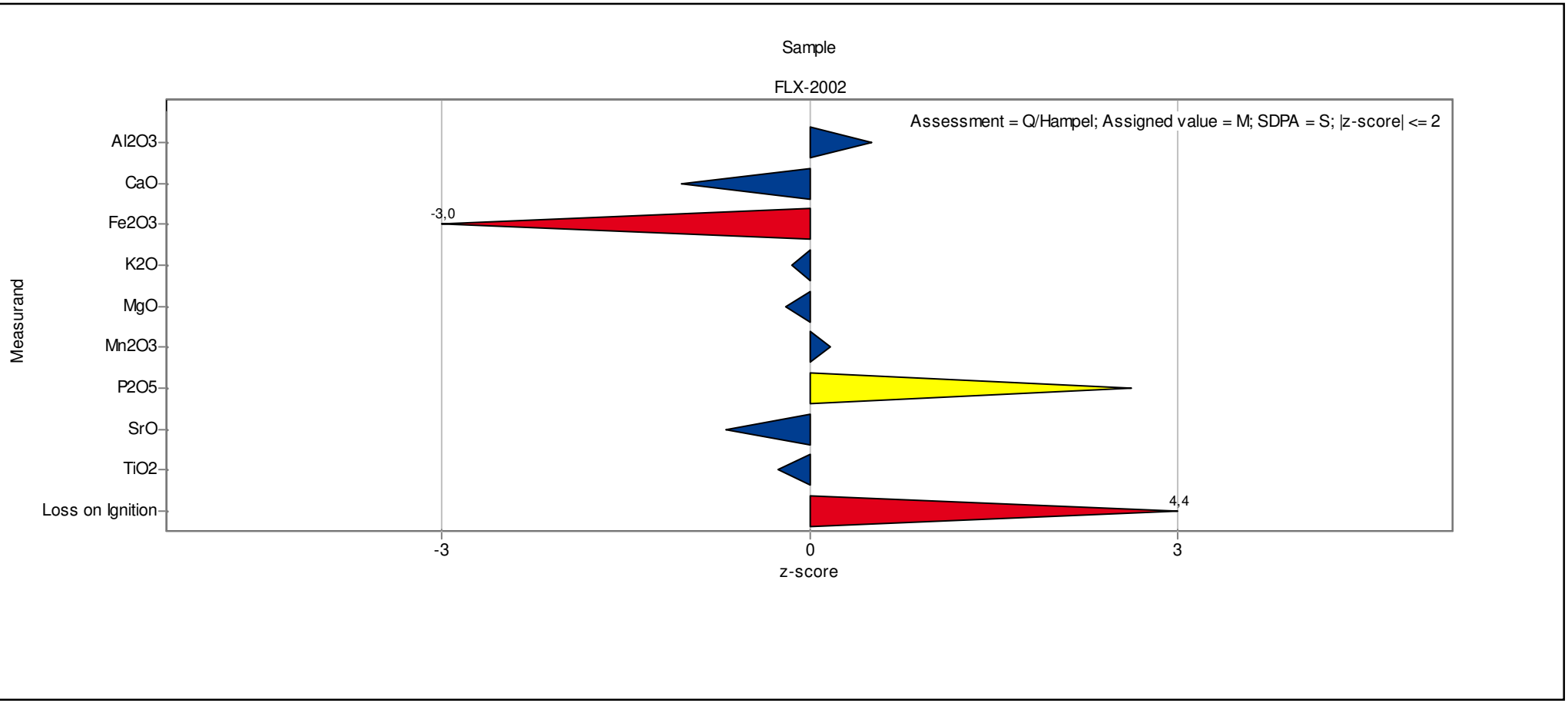
Laboratory: 38



RV_2024_01_Lime

Laboratory chart of z-scores

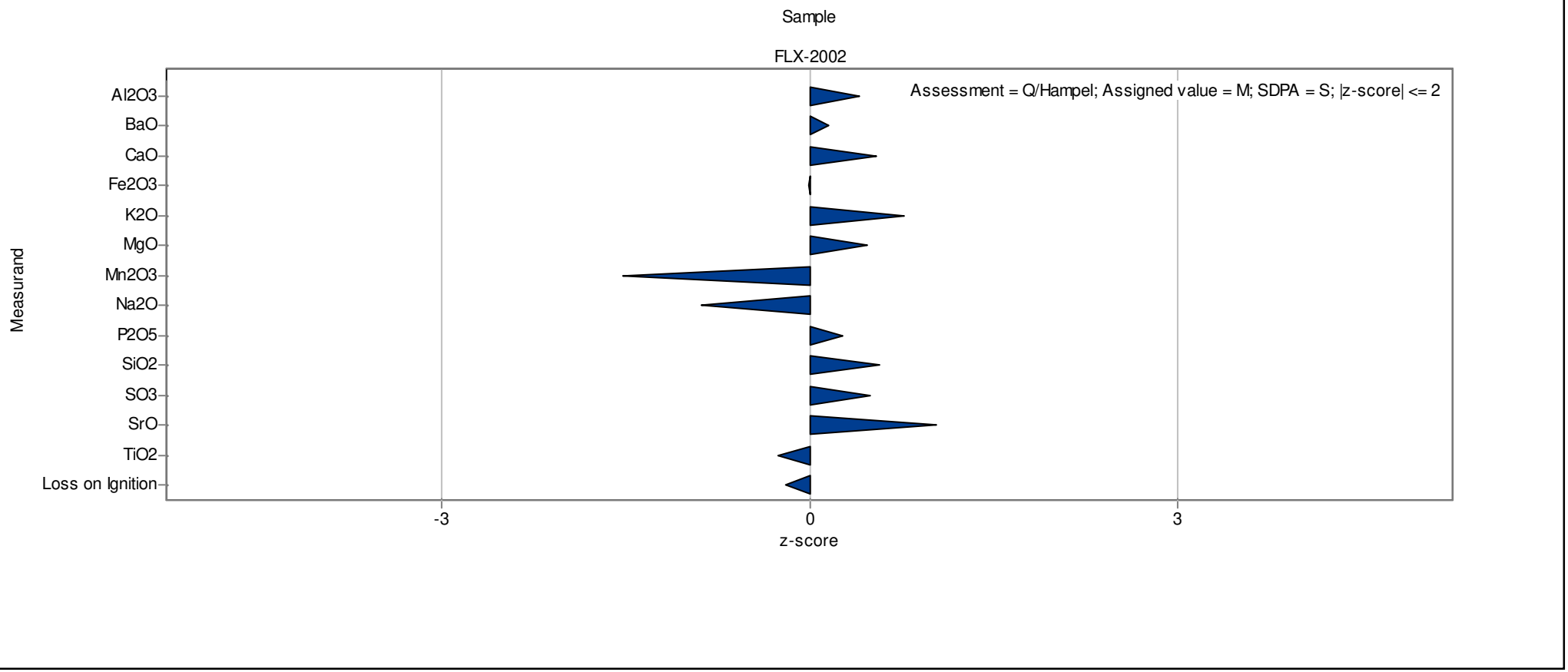
Laboratory: 39



RV_2024_01_Lime

Laboratory chart of z-scores

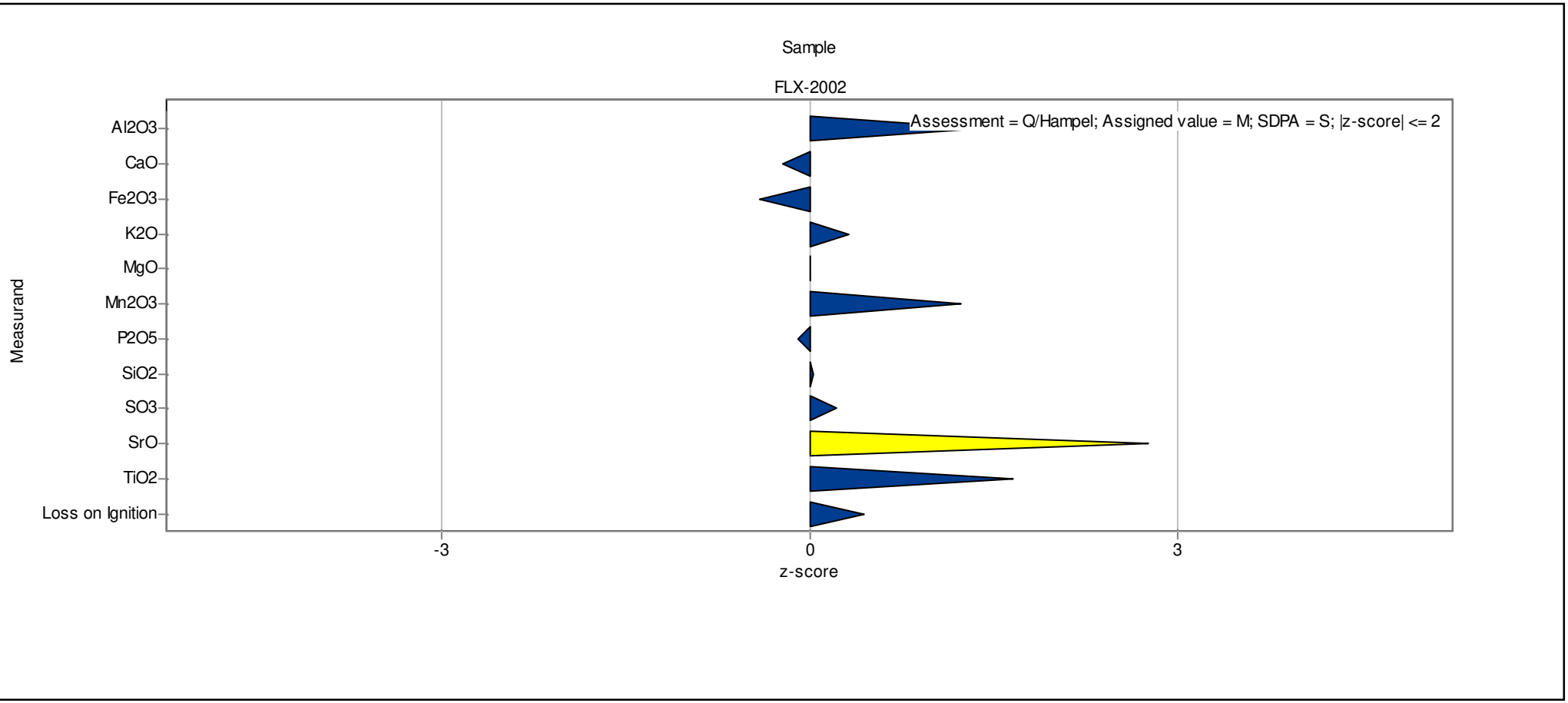
Laboratory: 40



RV_2024_01_Lime

Laboratory chart of z-scores

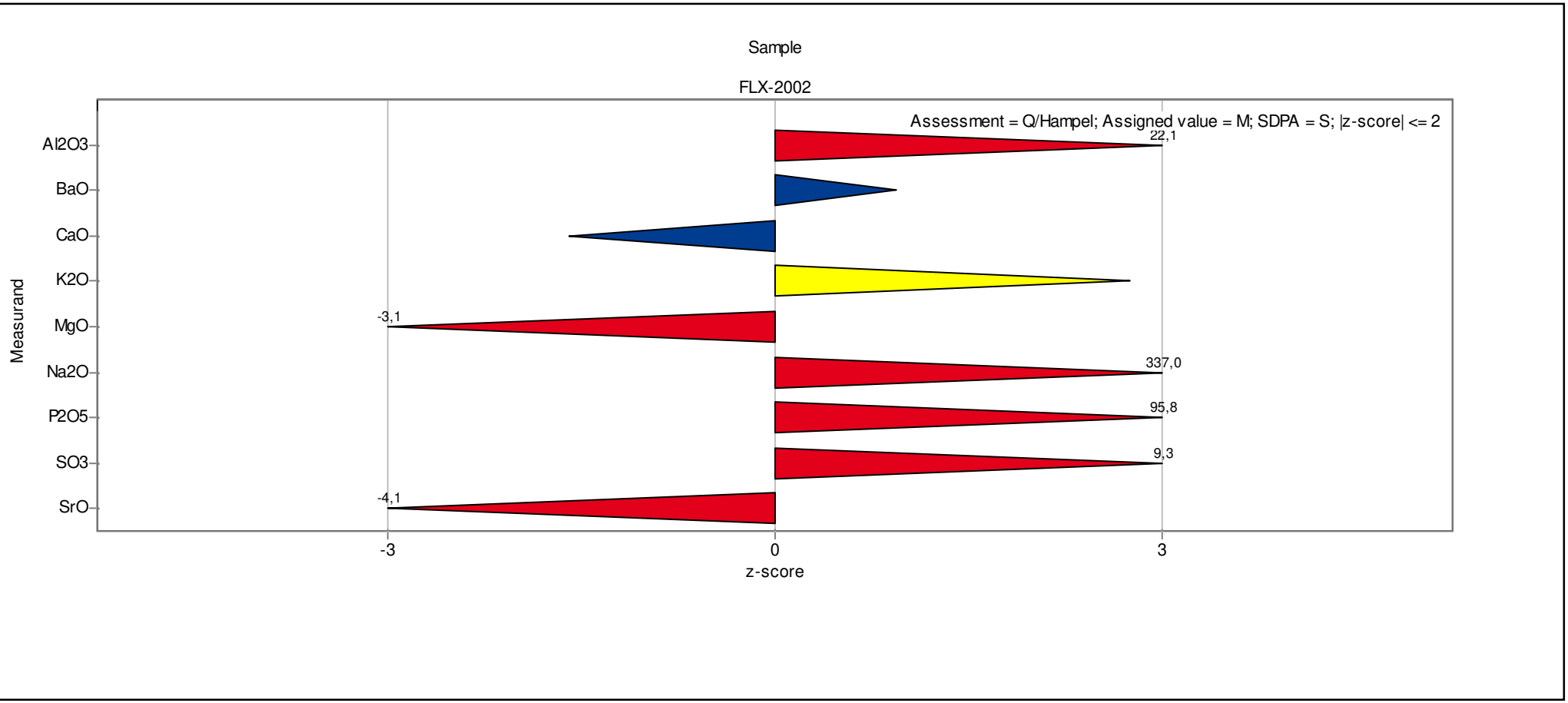
Laboratory: 41



RV_2024_01_Lime

Laboratory chart of z-scores

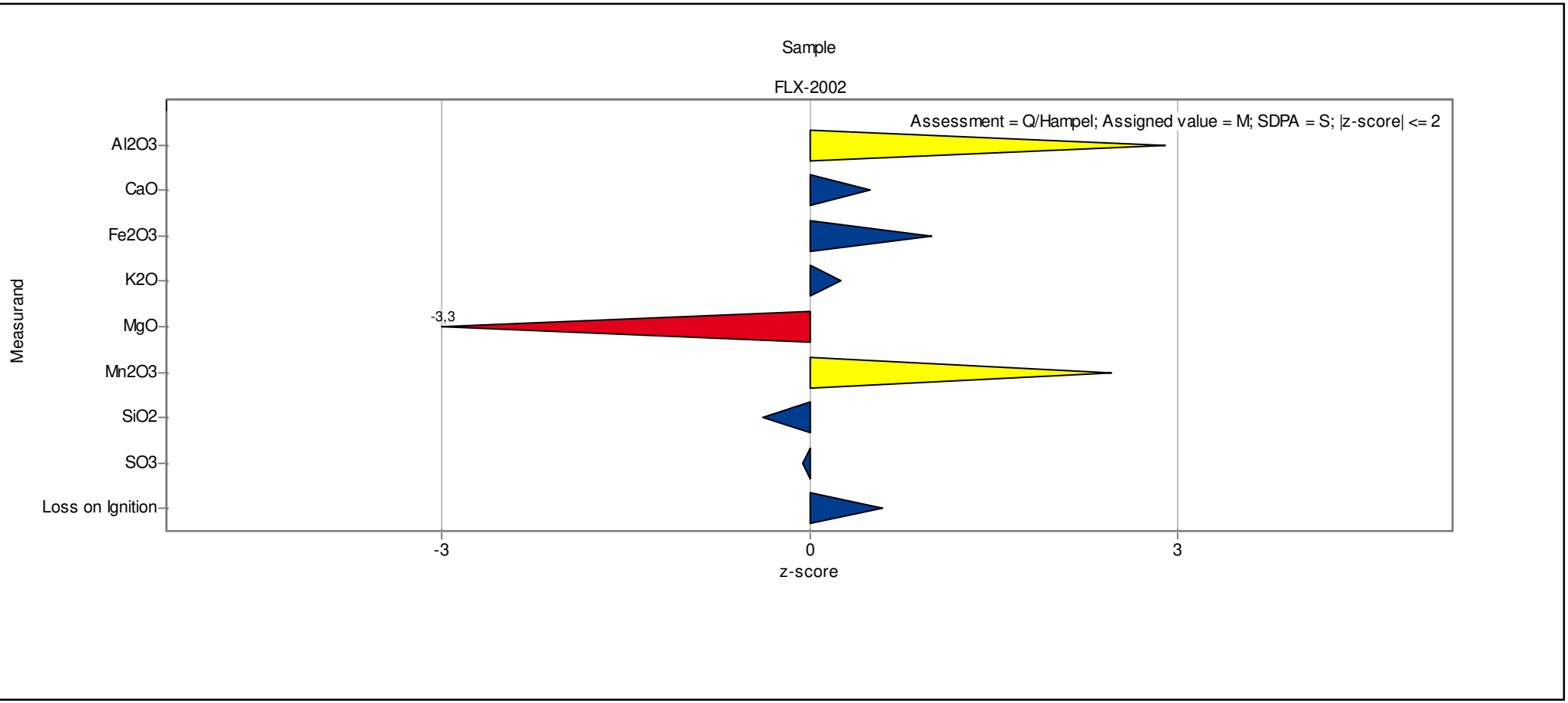
Laboratory: 42



RV_2024_01_Lime

Laboratory chart of z-scores

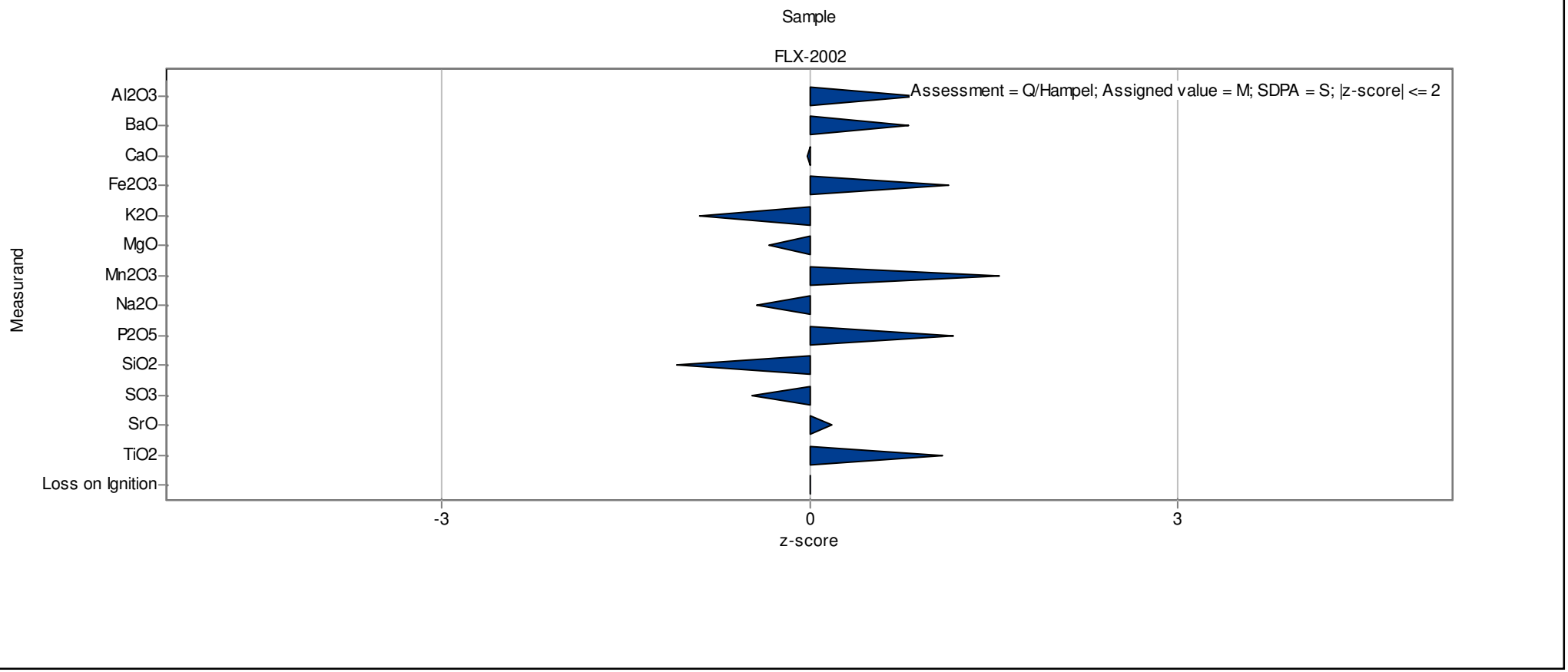
Laboratory: 43



RV_2024_01_Lime

Laboratory chart of z-scores

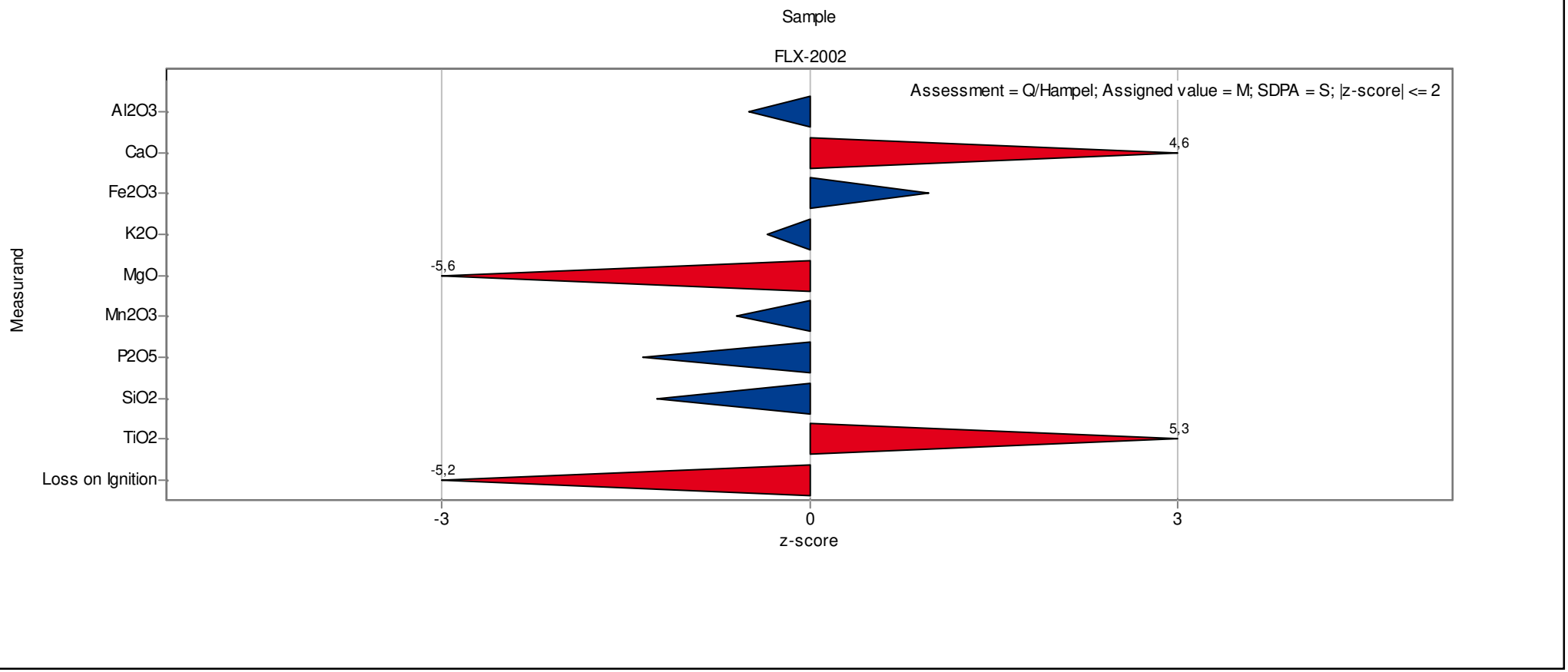
Laboratory: 44



RV_2024_01_Lime

Laboratory chart of z-scores

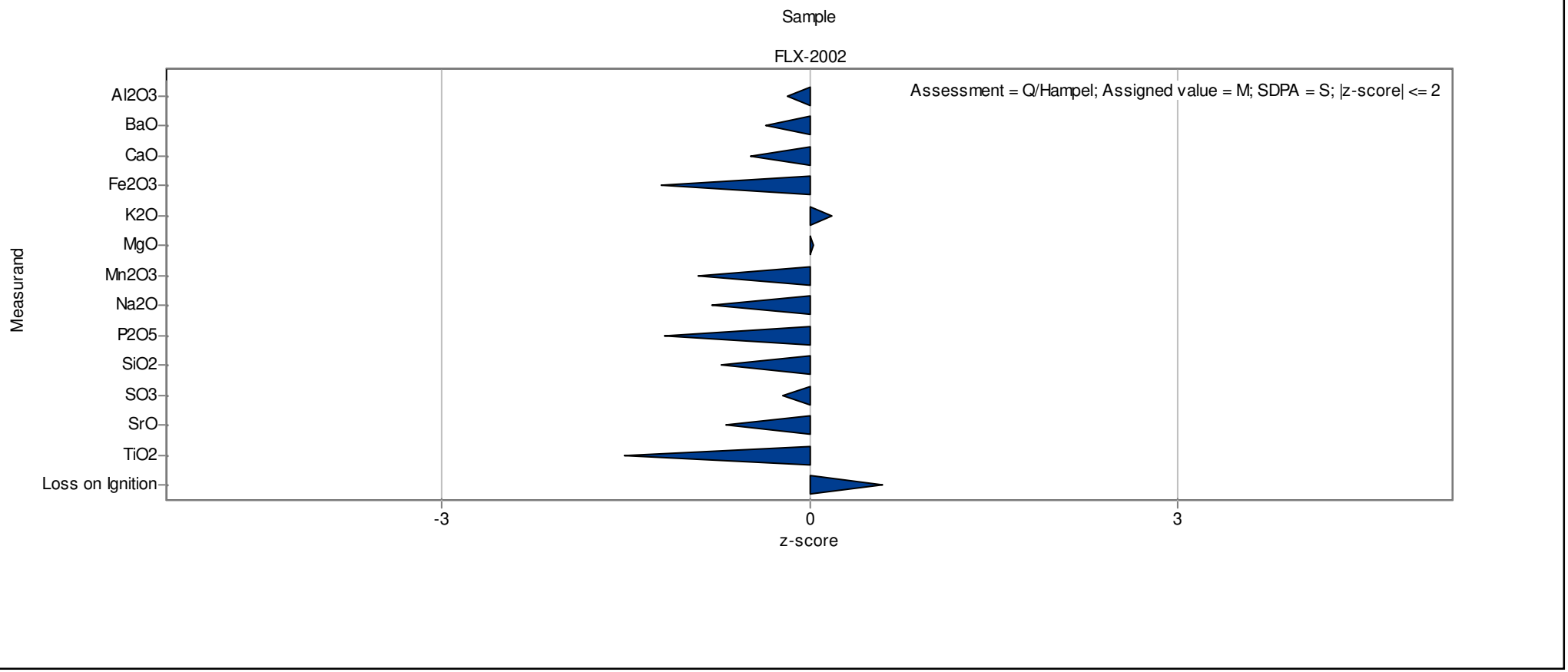
Laboratory: 46



RV_2024_01_Lime

Laboratory chart of z-scores

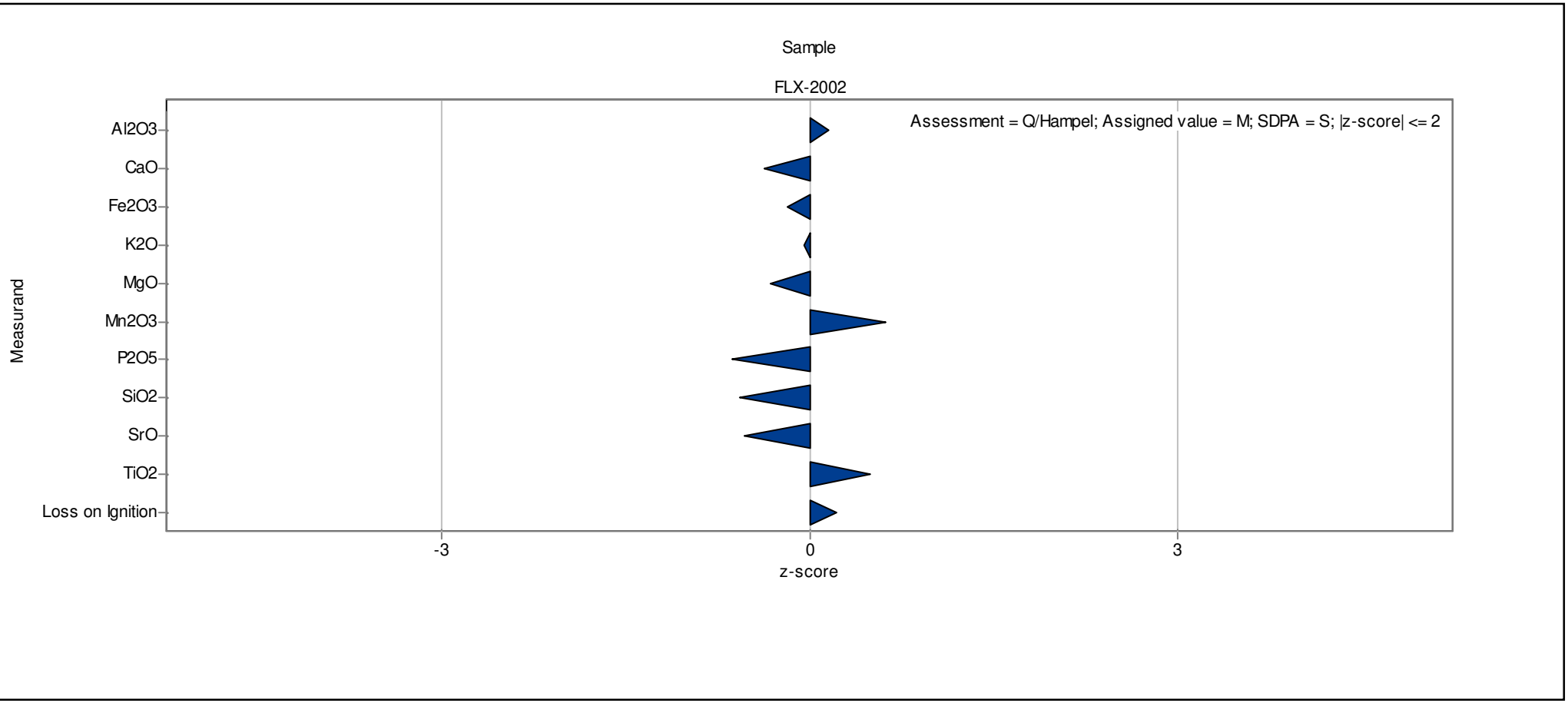
Laboratory: 47



RV_2024_01_Lime

Laboratory chart of z-scores

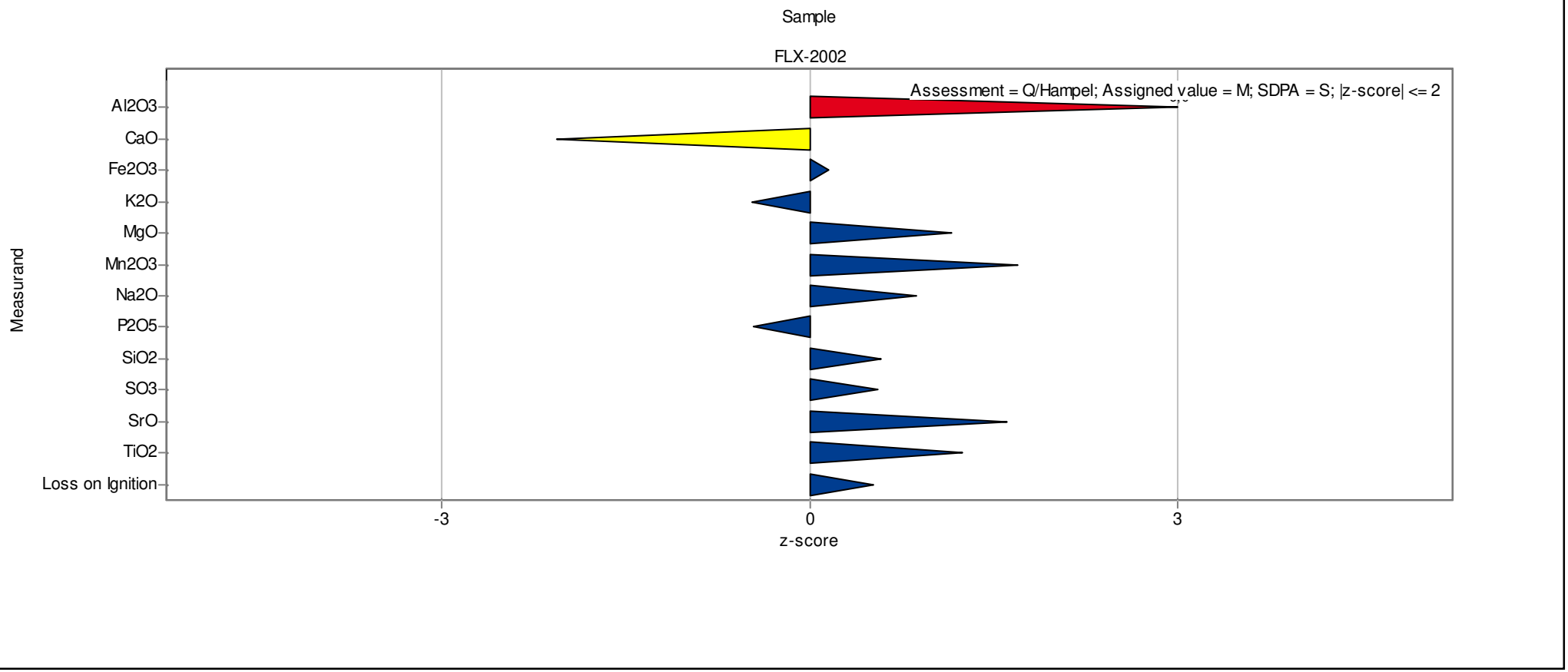
Laboratory: 48



RV_2024_01_Lime

Laboratory chart of z-scores

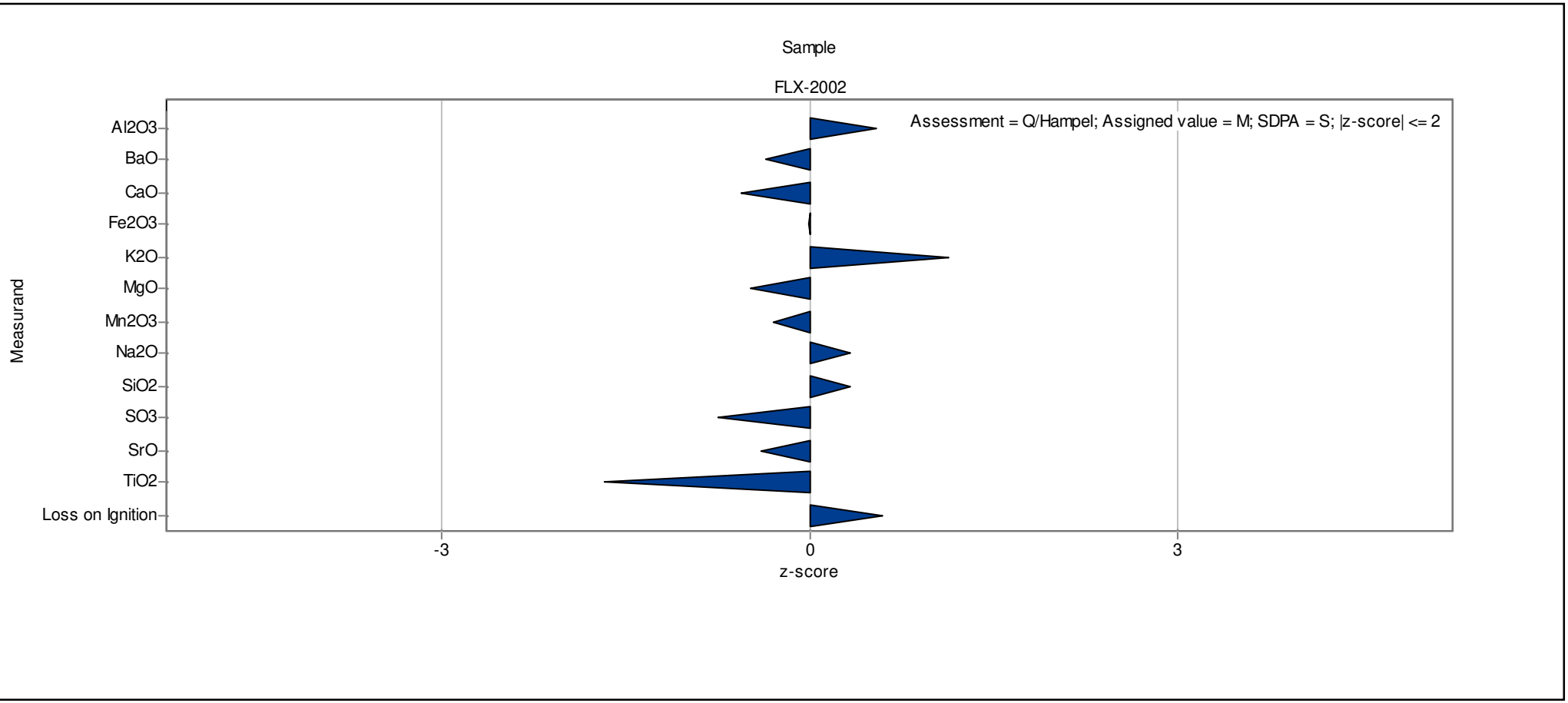
Laboratory: 49



RV_2024_01_Lime

Laboratory chart of z-scores

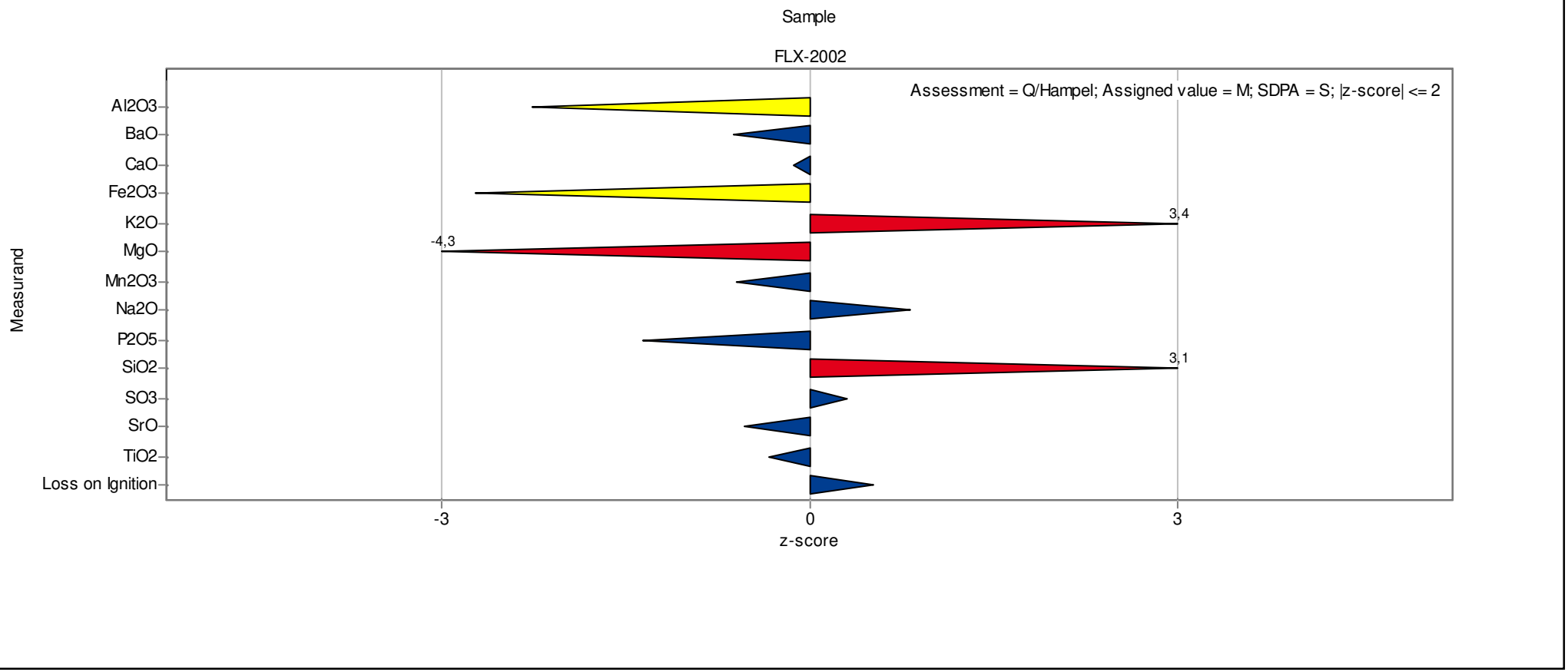
Laboratory: 50



RV_2024_01_Lime

Laboratory chart of z-scores

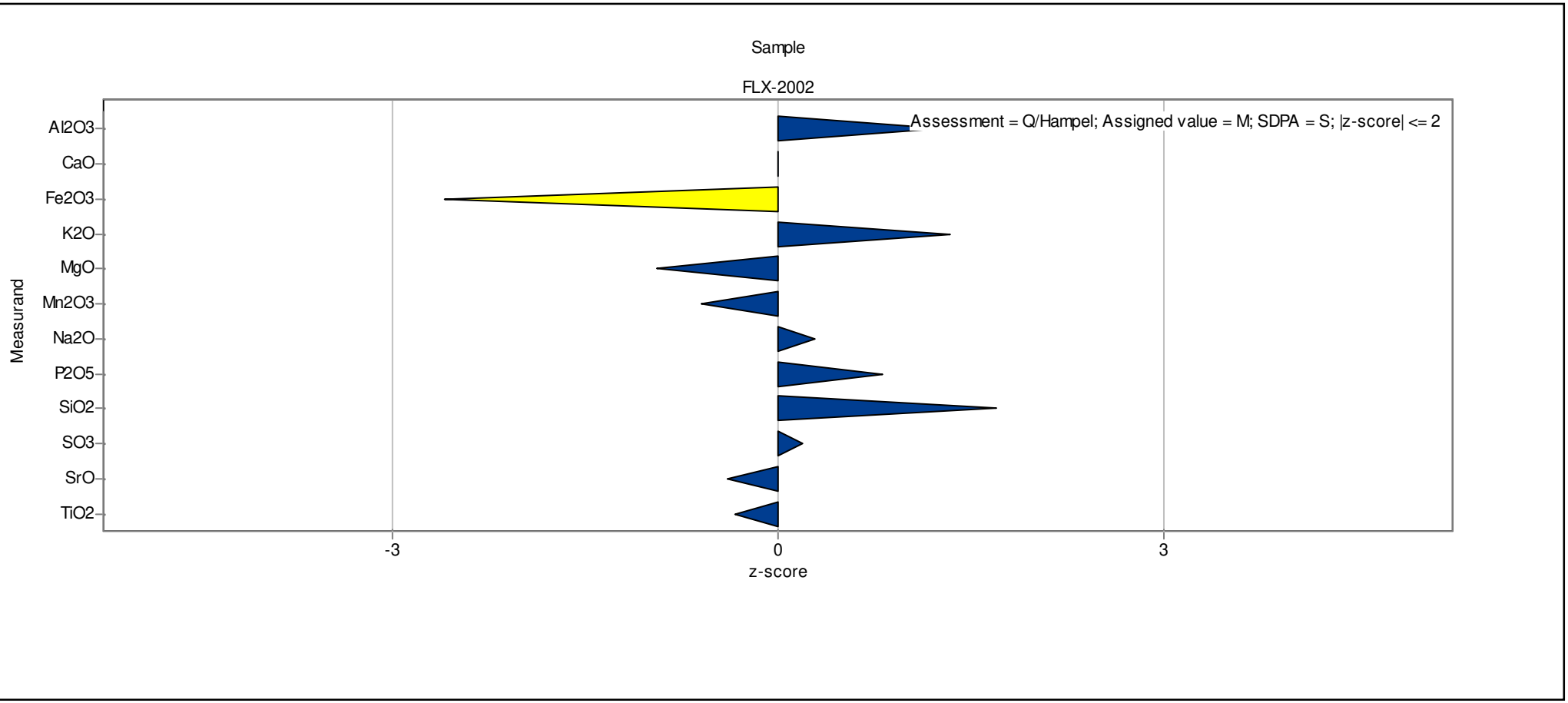
Laboratory: 52



RV_2024_01_Lime

Laboratory chart of z-scores

Laboratory: 53



RV_2024_01_Lime

Laboratory chart of z-scores

Laboratory: 55