



# **IFA-Proficiency Testing Scheme zur Wasseranalytik / for Water Analysis**

**Endbericht / Final Report**  
Eignungsprüfungsrunde / Proficiency testing round  
**M176**

**Metalle / Metals**

Probenversand / Sample dispatch: 03.03.2025

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## Allgemeine Informationen

Diese Zusammenfassung beschreibt die 176. Runde der regelmäßigen Eignungsprüfungen zur Parametergruppe „Metalle“. Die Prüfgegenstände M176A und M176B wurden am 03.03.2025 an 34 Teilnehmer versendet. Jedes Labor erhielt zwei Prüfgegenstände zu je 250 ml, abgefüllt in LDPE-Flaschen.

Einsendeschluss für die Ergebnisse war am 28.03.2025. Von 33 Teilnehmern wurden Ergebnisse übermittelt.

Zur Anonymisierung wurde jedem Labor per Zufallsgenerator ein Buchstabencode zugeteilt.

## Zusammensetzung des Prüfgegenstands

Die Prüfgegenstände M176A und M176B enthielten Al, As, Cd, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Se, U und Zn in einer den natürlichen Bedingungen angepassten Matrix, welche durch Zugabe von hochreinen Salzen ( $\text{CaCO}_3$ ,  $\text{Mg}(\text{NO}_3)_2$ , NaCl und KCl),  $\text{H}_2\text{SO}_4$ , HCl und eines Sr-Standards eingestellt wurde: 45,6 mg/l Ca, 19,5 mg/l Mg, 8,9 mg/l Na, 1,14 mg/l K, 19,2 mg/l  $\text{SO}_4^{2-}$ , ca. 15,3 mg/l Cl<sup>-</sup> und 405 (813) µg/l Sr M176A (M176B). Die Prüfgegenstände wurden mit hochreiner  $\text{HNO}_3$  (0,5 % v/v) bei pH < 2 stabilisiert.

## Homogenitäts-, Richtigkeits- und Stabilitätsuntersuchung

Die Prüfgegenstände wurden vor dem Versand am IFA auf Homogenität und Richtigkeit untersucht. Die Ergebnisse der Kontrollanalytik finden sich auf den Rohdatenblättern sowie auf den Auswertungen zu jedem Parameter.

Die Ergebnisse dieser Messungen sind in den Rohdaten-Tabellen und im parameterorientierten Teil dieser Auswertung aufgelistet. Die Stabilitätsuntersuchungen zu allen Parametern werden zusammen mit der Kontrollanalytik zur folgenden Runde (M177) durchgeführt.

Nach unseren Erfahrungen bleiben die Konzentrationen aller Parameter, mit Ausnahme von Hg, bei Lagerung bei 4-6°C im Dunkeln bis 18 Monate stabil. Bei Hg ist eine Konzentrationsabnahme von 2 % bis 4 % pro Monat zu erwarten.

## Zugewiesene Werte

Die zugewiesenen Werte ergaben sich aus den Wägewerten der zur Herstellung der Prüfgegenstände verwendeten Standards. Sie lagen bei Al, As, Cd, Cr, Fe, Hg, Cu, Mn, Ni, Pb, Se und Zn in mindestens einem Prüfgegenstand über den Mindestbestimmungsgrenzen der österreichischen Gewässerzustandsüberwachungsverordnung (GZÜV - BGBl. II. 479/2006).

Die Unsicherheiten der zugewiesenen Werte (erweiterte Unsicherheiten,  $k = 2$ ,  $\alpha = 0,05$ ) wurden nach den Vorgaben des EURACHEM / CITAC Guides „Quantifying Uncertainty in Analytical Measurement, 3<sup>rd</sup> Edition (2012)“ ermittelt.

## Auswertung

Mit den bei uns eingegangenen Messwerten wurde ein Ausreißertest nach Hampel durchgeführt. Die von diesem Test als auffällig eingestuft Werte sind in den Tabellen der parameterorientierten Auswertung mit einem Stern gekennzeichnet.

Die aus den ausreißerbereinigten Daten berechneten, auf die zugewiesenen Werte bezogenen mittleren Wiederfindungen lagen zwischen 94,0 % (Hg in M176B) und 104,3 % (Al in M176B). Die aus den ausreißerbereinigten Daten berechneten Standardabweichungen bewegten sich im Bereich von 2,8 % (Ni in M176A) bis 17,0 % (Se in M176B).

Zu den Mittelwerten und mittleren Wiederfindungen wurden auch die Vertrauensbereiche (P = 99 %) angegeben. Diese Vertrauensbereiche der Labormittelwerte enthielten in allen Fällen mit Ausnahme von Cu in M176A (95,8 % ± 2,7 %) sowie von Pb (95,9 % ± 3,2 %) und Cu (95,0 % ± 2,6 %) in M176B die entsprechenden zugewiesenen Werte mit ihren Unsicherheiten.

Die Standardunsicherheiten aller zugewiesenen Werte wurden nach dem Kriterium  $u(x_{pp}) < 0,3\sigma_{pp}$  oder  $u(x_{pp}) < 0,1\delta E$  (DIN ISO 13528, Punkt 9.2) überprüft und entsprach in allen Fällen bis auf Zn in M176A und M176B der Vorgabe. Bei Zink, sowie auch für Cu in M176A und M176B und für Pb in M176B wurde deshalb zusätzlich der Vergleich der absoluten Differenz zwischen zugewiesenem Wert ( $x_{pt}$ ) und Labormittelwert ( $\bar{X}$ ) unter Berücksichtigung der Messunsicherheiten  $u(x_{pt})$  und  $u(\bar{X})$  durchgeführt.

$$|x_{pt} - \bar{X}| < 2 * \sqrt{u(x_{pt})^2 + u(\bar{X})^2} \quad (\text{DIN ISO 13528, Punkt 7 und E7})$$

Zn entsprach dieser Vorgabe. Für Cu und Pb war dies jedoch nicht der Fall. Bei allen Parametern, Cu, Pb und Zn, sind die von den Teilnehmern erzielten z-Scores, mit Ausnahme der Ausreißer, welche tatsächlich stark vom zugewiesenen Wert abweichen, alle < 2. Somit wurden die ermittelten zugewiesenen Werte auch von den Teilnehmern bestätigt und als solche übernommen.

### **z-Score-Auswertung**

Ein z-Score ist die auf eine Standardabweichung bezogene Abweichung eines Messwertes vom zugewiesenen Wert. Er wird mittels folgender Formel berechnet:

$$z = \frac{x_i - X}{\sigma_{pt}}$$

<b>z</b>	z-Score
$x_i$	Messwert eines Labors
<b>X</b>	zugewiesener Wert oder ausreißerbereinigter Mittelwert („Konsenswert“)
$\sigma_{pt}$	Standardabweichung für die Eignungsbewertung

Es handelt sich also um das Verhältnis der Abweichung des Messwerts eines Labors vom zugewiesenen Wert zu einer vorgegebenen Standardabweichung.

Die Standardabweichungen für die Eignungsbewertung wurden aus den Ergebnissen der im Zeitraum 2014 - 2024 vom IFA-Tulln veranstalteten Eignungsprüfung berechnet.

Diese Vorgehensweise wurde deshalb gewählt, weil, unserer Erfahrung nach, die Standardabweichungen der ausreißerbereinigten Messwerte zwischen den einzelnen Eignungsprüfungen variieren. Die Ermittlung der Standardabweichung über die Eignungsprüfungsrunden aus mehreren Jahren bietet jedoch eine gut abgesicherte Basis auf einer breiten Datengrundlage und ist somit meistens besser geeignet, als das bei der direkt aus der Eignungsprüfung berechneten Standardabweichung der Fall wäre. (siehe EN ISO/IEC 17043:2023, B.4.1.3)

Der Vorteil, der sich für alle Teilnehmer daraus ergibt, ist, dass dadurch bei unseren Eignungsprüfungen schon vor der Teilnahme vorhersehbar ist, welche z-Scores man mit den eigenen, aus Routineverfahren bekannten, Messabweichungen erwarten kann.

### Rechenbeispiel:

Ein Labor bestimmte für den Parameter Aluminium einen Messwert von 73,7 µg/l (Wiederfindung von 101,94 %). Der zugewiesene Wert für Aluminium lag bei 72,3 µg/l (100 %).

In der nachfolgenden Tabelle (und in der Tabelle des Jahresprogrammes [www.ifatest.at](http://www.ifatest.at)) ist die relative Standardabweichung für die Eignungsbewertung beim Parameter Aluminium mit 7,5 % angegeben. Bezogen auf den zugewiesenen Wert 72,3 µg/l Al entsprechen 7,5 % 5,4 µg/l.

$$z = \frac{x_i - X}{\sigma_{pt}} = \frac{73,7 \mu\text{g/l} - 72,3 \mu\text{g/l}}{5,4 \mu\text{g/l}} \approx 0,26 \quad \text{oder} \quad \frac{101,94 \% - 100 \%}{7,5 \%} \approx 0,26$$

$z$	z-Score	
$x_i$	73,7 µg/l	entsprechen 101,94 % (Messwert des Labors)
$X$	72,3 µg/l	entsprechen 100 % (zugewiesener Wert)
$\sigma_{pt}$	5,4 µg/l	entsprechen 7,5 % (Standardabweichung für die Eignungsbewertung, siehe Tabelle unten)

Abweichungen in den Nachkommastellen können sich bei Nachberechnung dadurch ergeben, dass im Bericht bei den Wiederfindungen zwecks Übersichtlichkeit gerundete Werte angegeben sind.

Die folgende Tabelle enthält die Standardabweichung für die Eignungsbewertung bezogen auf den zugewiesenen Wert mit ihren Anwendungsbereichen. Die Berechnung von z-Scores erfolgt nur dann, wenn der zugehörige zugewiesene Wert über der in der Tabelle angegebenen Konzentration liegt.

Parameter	Standardabweichung für die Eignungsbewertung bezogen auf den zugewiesenen Wert	untere Grenze
Aluminium	7,5 %	7,5 µg/l
Arsen	6,6 %	0,5 µg/l
Blei	6,5 %	0,3 µg/l
Cadmium	5,0 %	0,1 µg/l
Chrom	5,9 %	0,5 µg/l
Eisen	6,4 %	10 µg/l
Kupfer	7,3 %	1,0 µg/l
Mangan	5,1 %	2,0 µg/l
Nickel	6,4 %	0,75 µg/l
Quecksilber	11 %	0,2 µg/l
Selen	8,5 %	0,45 µg/l
Uran	5,4 %	0,35 µg/l
Zink	6,5 %	3 µg/l

Zur Interpretation von z-Scores wird meist folgende Klassifikation vorgeschlagen:

z-Score	Klassifikation
≤2	zufriedenstellend
2< z <3	fraglich
≥3	nicht zufriedenstellend

Die z-Scores sind in der parameterorientierten Auswertung in den Tabellen neben den Wiederfindungen angegeben. Jedes Labor erhält zusätzlich zu dieser Auswertung ein Blatt, auf dem die erzielten z-Scores zusammengefasst und grafisch dargestellt sind. Die Standardabweichungen für die Eignungsbewertung sind dort in Konzentrationseinheiten angegeben.

Eine Übersichtstabelle aller z-Scores ist im Anschluss an die Rohdatentabellen im parameterorientierten Teil zu finden.

### **Zur Darstellung der Ergebnisse in der Auswertung:**

Eine Legende zur Darstellung der Ergebnisse finden Sie auf der nächsten Seite. In den Tabellen der Auswertung sind jeweils zugewiesener Wert, Messwert, Unsicherheit und die Wiederfindung dargestellt. In der parameterorientierten Auswertung befindet sich der Sollwert direkt unter der Parameterbezeichnung. Die Unsicherheit des Sollwertes ist immer als erweiterte Unsicherheit ( $k = 2$ ;  $\alpha = 0,05$ ) angegeben. Sie wurde nach den Vorgaben des EURACHEM / CITAC Guides „Quantifying Uncertainty in Analytical Measurement, 3<sup>rd</sup> Edition (2012)“ ermittelt. Die grafische Darstellung der Ergebnisse enthält die Unsicherheit des zugewiesenen Wertes als grau unterlegtes Band.

In der Spalte „A“ bei der parameterorientierten Auswertung wurden die Messwerte, die nach dem Test nach Hampel als Ausreißer gewertet wurden, mit einem Stern (\*) gekennzeichnet. Die Grafik der Messwerte wurde für alle Parameter auf  $100 \% \pm 45 \%$  des zugewiesenen Wertes skaliert. Die kleine Tabelle unten links enthält statistische Parameter, darunter den 99 % - Vertrauensbereich der Labormittelwerte vor und nach Ausreißereliminierung.

Ergebnisse, für die keine Wiederfindung bzw. Abweichung vom zugewiesenen Wert berechnet werden kann (d.h. „Kleiner als“ Ergebnisse oder Zahlenwerte bei nicht zugegebenen Substanzen) werden in den Tabellen und Grafiken entweder als **FN** (falsch negativ), **FP** (falsch positiv) oder als • - Symbol dargestellt.

- Als falsch negativ gelten „< Ergebnisse“ mit einem Betrag des Zahlenwertes unterhalb des zugewiesenen Wertes bzw. Messwert „0“ bei zugegebenen Substanzen.
- Falsch positive Ergebnisse sind für Substanzen möglich, die über „< zugewiesener Wert“ ausgewertet wurden. Mit FP werden alle Messwerte gekennzeichnet, die mit ihren Unsicherheiten das Kriterium „< zugewiesener Wert“ nicht einschließen (tangieren).
- Mit einem • - Symbol werden alle weiteren Ergebnisse illustriert, für die keine Wiederfindung berechnet werden kann

### **Prüfmethoden**

Den Teilnehmenden stand die Wahl der Analysenmethode frei. Die Parameter sollten mit den im jeweiligen Teilnehmerlabor eingesetzten Routineverfahren bestimmt werden. Eine Übersicht der angewendeten Methoden befindet sich am Ende des Berichts. Beim Parameter Cadmium war der einzige mittels Graphitrohr-AAS gemessene Wert auffällig ( $|z\text{-Score}| > 3$ ). Beim Parameter Selen war der einzige mittels ICP-OES bestimmte Wert ebenfalls auffällig ( $|z\text{-Score}| > 3$ ). Beim Parameter Chrom fielen zwei mittels ICP-OES bestimmte Werte auf ( $|z\text{-Score}| > 3$ ). Da jeweils nur ein bzw. zwei Werte pro Methode vorliegen, ist eine weiterführende Auswertung nicht möglich.

„< Werte“ bzw. „> Werte“ sowie stark abweichende Messwerte, welche zu einer unübersichtlichen Skalierung führen würden, sind in den Graphiken nicht berücksichtigt.

Tulln, 10. April 2025

**Probe M106A**

**Parameter Kupfer**

\*Sollwert ± U (k=2) 4,79 µg/l ± 0,13 µg/l  
 IFA-Kontrolle ± U (k=2) 4,79 µg/l ± 0,38 µg/l  
 IFA-Stabilität ± U (k=2) 4,69 µg/l ± 0,38 µg/l

\*Sollwert = "zugewiesener Wert"  
**Sollwert ± Unsicherheit aus Einwaage**  
**Kontrollmessung IFA vor Versand**  
**Messung IFA 3 Wochen nach Versand**

Labor-Kennung	Messwert	±	Einheit	Wiederfindung	z-Score
A	5,16	0,4128	µg/l	108%	0,90
B	4,22	0,42	µg/l	88%	-1,38
C	4,45	0,13	µg/l	93%	-0,83
D			µg/l		
E			µg/l		
F	4,10	0,08	µg/l	86%	-1,68
G			µg/l		
H			µg/l		
I	4,75	0,74	µg/l	99%	-0,10
J	<5		µg/l	*	
K	4,76		µg/l	99%	-0,07
L	<10		µg/l	*	
M	4,8	0,5	µg/l	100%	0,02
N	3,7	0,4	µg/l	77%	-2,65
O	4,47	0,447	µg/l	93%	-0,78
P	6,0		µg/l	125%	2,94
Q	4,17	0,2	µg/l	87%	-1,51
R	4,6	0,8	µg/l	96%	-0,46
S	4,44	0,67	µg/l	93%	-0,85
T			µg/l		
U	4,675	0,935	µg/l	95%	-0,28
V	5,0	0,50	µg/l	104%	0,51
W	3,54	0,3	µg/l	74%	-3,03
X	7,108	0,749	µg/l	148%	5,63
Y	<10		µg/l	*	
Z			µg/l		
AA	<3,0		µg/l	FN	
AB	3,775	0,107	µg/l	79%	-2,46
AC	<10,0		µg/l	*	

Wiederfindung des zugewiesenen Wertes in Prozent

z-Score des Labors

Ein Stern markiert einen Ausreißer nach dem Hampel-Test

Ergebnisunsicherheit laut Teilnehmer

	alle Ergebnisse	ohne Ausreißer	Einheit
MW ± VB(99%)	4,65 ± 0,57	4,51 ± 0,42	µg/l
WF ± VB(99%)	97,1 ± 12,0	94,1 ± 8,8	%
Standardabw.	0,84	0,59	µg/l
rel. Standardabw.	18,1	13,2	%
n für Berechnung	18	17	

Standardabweichung zwischen den Labors

Mittelwert der Messwerte und Wiederfindung des zugewiesenen Wertes mit zugehörigen Vertrauensbereichen (p=99%)

Anzahl der Messungen zur Berechnung der statistischen Kenngrößen

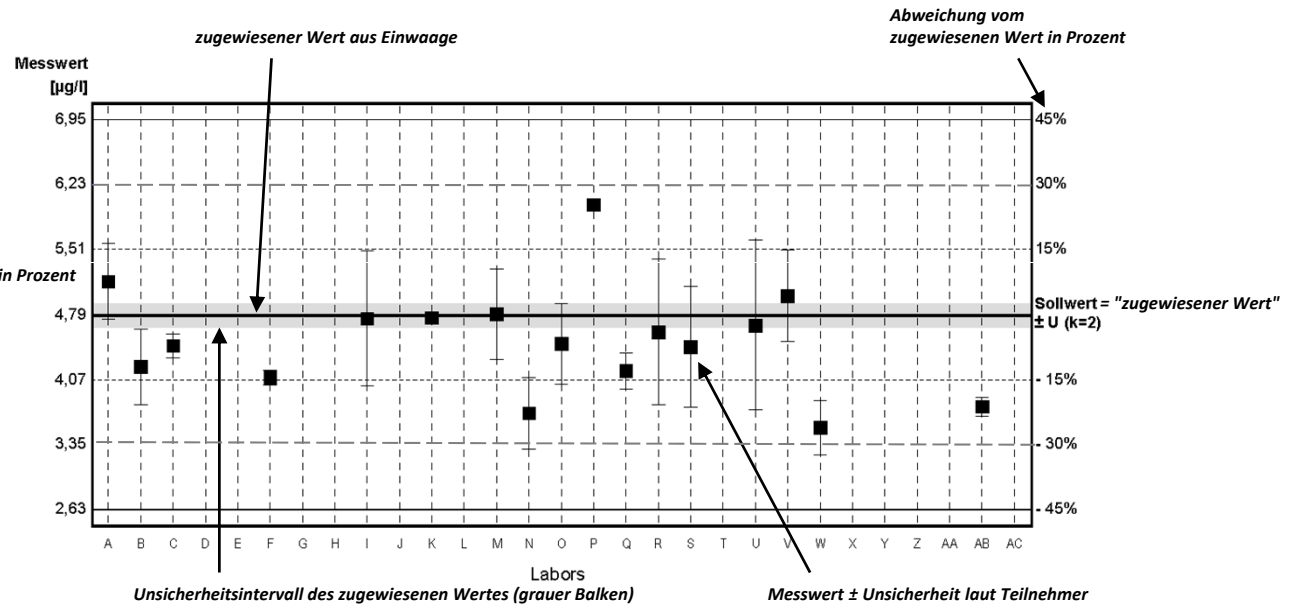
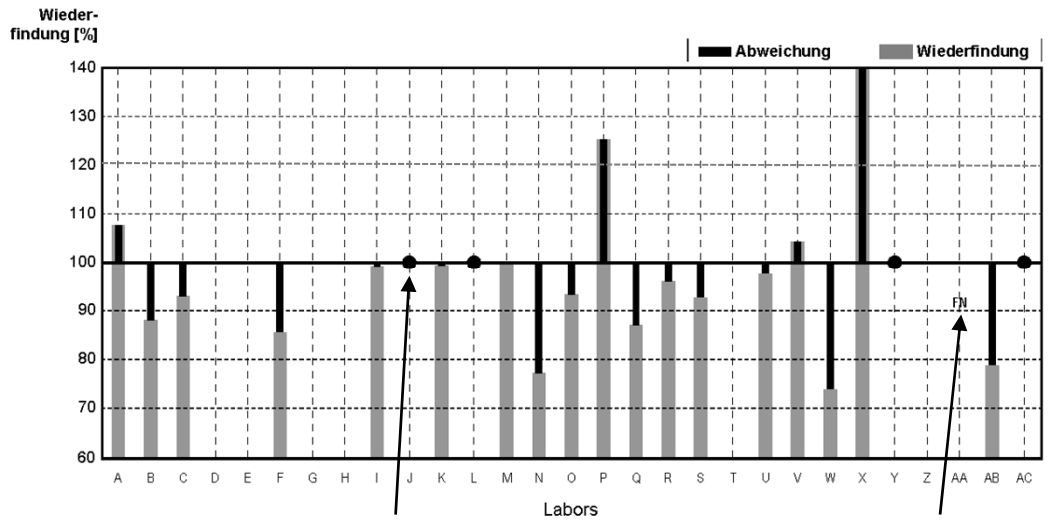


Diagramm 1: Messwerte mit zugehörigen Unsicherheitsintervallen



Ergebnis abgegeben, Berechnung der Wiederfindung oder Zuordnung FN, FP nicht möglich

Falsch negativ „< Ergebnis“ kleiner als der theoretische Sollwert

Diagramm 2: Wiederfindung und Abweichung vom zugewiesenen Wert

LEGENDE

## Information

This report summarises the results of the round M176 (trace metals) within the IFA-Proficiency Testing Scheme for Water Analysis. The proficiency testing items M176A and M176B were distributed to 34 participants on Monday, 3 March 2025. Each participant received two proficiency testing items of 250 mL filled into LDPE bottles.

Closing date for reporting results to the IFA-Tulln was Friday, 28 March 2025. 33 participants submitted results. To make the participants anonymous, each laboratory obtained a letter code by random.

### Proficiency testing items

The proficiency testing items consisted of artificial ground water spiked with pure standards. For the preparation, ultrapure water was spiked with concentrated solutions of salts to simulate the ionic composition of natural Austrian ground water. The ultrapure salts  $\text{CaCO}_3$ ,  $\text{Mg}(\text{NO}_3)_2$ ,  $\text{NaCl}$ ,  $\text{KCl}$  were used and the ultrapure acids  $\text{H}_2\text{SO}_4$  and  $\text{HCl}$  as well as an additional Sr standard were added. By this, the matrix of the proficiency testing items consisted of about 45.6 mg/L Ca, 19.5 mg/L Mg, 8.9 mg/L Na, 1.14 mg/L K, 19.2 mg/L  $\text{SO}_4^{2-}$ , approx. 15.3 mg/L  $\text{Cl}^-$  and 405 (813)  $\mu\text{g/L}$  Sr M176A (M176B). Ultrapure  $\text{HNO}_3$  (0.5 % v/v) was added to stabilise the proficiency testing item at a pH below 2, which meets the standard sampling procedure in the Austrian monitoring program.

Traces of Al, As, Cd, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Se, U and Zn were added, using certified standards. For most of the compounds added to the proficiency testing items, the assigned concentrations were higher than the minimum quantifiable values of the Austrian ground and river water monitoring program. The calculation of the assigned concentrations of the compounds was based on the mass of standard added to the proficiency testing items.

### Homogeneity, accuracy and stability tests

Some proficiency testing items of M176A and M176B were analysed for all investigated parameters prior to shipment to the participants. The results are listed in the results tables and the parameter oriented part of the report ("IFA result").

Stability tests will be carried out together with the accuracy tests of the following round (M177). According to our experience, the concentrations of all parameters except Hg in the proficiency testing items remain stable up to 18 months when stored at 4-6 °C in the dark. For the parameter Hg a concentration decrease of 2 % to 4 % per month can be expected.

## Results

Data evaluation was based on assigned concentrations that were calculated from the weights of the standards used to produce the proficiency testing items. Their uncertainty intervals correspond to the expanded uncertainty (coverage factor  $k = 2$ ) as described in the EURACHEM/CITAC Guide "Quantifying Uncertainty in Analytical Measurement, 3<sup>rd</sup> Edition (2012)".

Recoveries for individual laboratory results and overall mean values are related to the assigned concentrations. The results were tested for outliers by application of the Hampel outlier test (level of significance 99 %).

The recoveries of the assigned concentrations, calculated from outlier-corrected data mean values ranged between 94.0 % (Hg in M176B) and 104.3 % (Al in M176B).

The between laboratory CVs covered the ranged between 2.8 % (Ni in M176A) and 17.0 % (Se in M176B).



All confidence intervals of the outlier-corrected laboratory mean values except that for Cu (95.8 % ± 2.7 %) in sample M176A and Pb (95.9 % ± 3.2 %) and Cu (95.0 % ± 2.6 %) in sample M176B encompass the corresponding assigned values with their uncertainties. For all other parameters, no difference could be detected between assigned concentrations and outlier corrected laboratory mean values statistically.

The standard uncertainties of all assigned values were checked according to the criterion

$$u(x_{pp}) < 0,3\sigma_{pp} \text{ oder } u(x_{pp}) < 0,1\delta E \quad (\text{DIN ISO 13528, Section 9.2})$$

and met the requirement in all cases except for Zn in M176A and M176B.

For Zn and additionally for Cu in M176A and M176B and Pb in M176B, the comparison of the absolute difference between the assigned value ( $x_{pt}$ ) and the laboratory mean value ( $\bar{X}$ ), considering the measurement uncertainties  $u(x_{pt})$  and  $u(\bar{X})$ , was additionally carried out.

$$|x_{pt} - \bar{X}| < 2 * \sqrt{u(x_{pt})^2 + u(\bar{X})^2} \quad (\text{DIN ISO 13528, Section 7 and E7})$$

Zn met the requirement. However, this was not the case for Cu and Pb.

For all, Cu, Pb and Zn the z-scores obtained were all < 2, except for the outliers, which indeed deviated significantly from the assigned value. Thus, the determined assigned values were also confirmed by the participants and adopted as such.

### **z-scores**

The most common approach to calculate a z-score is given by

$$z = \frac{x_i - X}{\sigma_{pt}}$$

<b>z</b>	z-score
$x_i$	result of laboratory
$X$	assigned value or mean value („consensus value“)
$\sigma_{pt}$	standard deviation for proficiency assessment

Thus, the z-score is the ratio of the estimated bias (difference between result and assigned value) and a standard deviation. The z-score criteria were determined from relative standard deviations from all interlaboratory comparisons that have been organised by the IFA-Tulln from 2014 to 2024. They represent average performance data of all former participating laboratories.

This approach was chosen, because standard deviations of the outlier-corrected measurements substantially vary between individual proficiency test rounds. Averaging standard deviations from proficiency testing rounds of several years can provide standard deviations for proficiency assessment on a broad data basis. It is therefore more suitable than a standard deviation taken directly from the interlaboratory comparison (EN ISO/IEC 17043:2023, B.4.1.3). Another advantage of previously determined standard deviations is that the participants can foresee which z-scores can be expected by their routine analysis methods before participation.

### Calculation example:

A laboratory found 73.7 µg/L for the parameter Aluminium (recovery of 101.94 %). The assigned value for Aluminium was 72.3 µg/L (100 %). The relative standard deviation for proficiency assessment is given in the table below (as well as in the annual program [www.ifatest.eu](http://www.ifatest.eu)) by 7.5 %, which is 5.4 µg/L Al, when based on the assigned value.

$$z = \frac{x_i - X}{\sigma_{pt}} = \frac{73.7 \mu\text{g/L} - 72.3 \mu\text{g/L}}{5.4 \mu\text{g/L}} \approx 0.26 \quad \text{or} \quad \frac{101.94 \% - 100 \%}{7.5 \%} \approx 0.26$$

$z$	Z-score	
$x_i$	73.7 µg/L	equivalent to 101.94 % (result of the laboratory)
$X$	72.3 µg/L	equivalent to 100 % (assigned value)
$\sigma_{pt}$	5.4 µg/L	equivalent to 7.5 % (standard deviation for proficiency assessment see table below)

In the case of recalculation, deviations in the last digits may occur since rounded values are given in the report for clarity.

The following table lists the standard deviations for proficiency assessment and their limits of applicability.

Parameter	standard deviation for proficiency assessment based on the assigned value	Lower limit
Aluminium	7.5 %	7.5 µg/L
Arsenic	6.6 %	0.5 µg/L
Cadmium	5.0 %	0.1 µg/L
Chromium	5.9 %	0.5 µg/L
Copper	7.3 %	1.0 µg/L
Iron	6.4 %	10 µg/L
Lead	6.5 %	0.3 µg/L
Manganese	5.1 %	2.0 µg/L
Mercury	11 %	0.2 µg/L
Nickel	6.4 %	0.75 µg/L
Selenium	8.5 %	0.45 µg/L
Uranium	5.4 %	0.35 µg/L
Zinc	6.5 %	3 µg/L

Normally, a classification based on z-scores is made this way:

z-Score	Classification
≤2	satisfactory
2< z <3	questionable
≥3	unsatisfactory

The z-scores are listed in the parameter-oriented evaluation in the tables next to the recoveries. Additionally, each laboratory receives a sheet on which the obtained z-scores are summarized and graphically presented. The standard deviations for proficiency assessment are given in concentration units there.

An overview table of all z-scores can be found after the result tables in the parameter-oriented part.

### Illustration of results

An explanation to the illustration of the results is given on the following page.

The **laboratory oriented part** contains the measurement results and reported uncertainties of each individual laboratory for all parameters together with the achieved recoveries in graphical and tabular form. This part of the report also lists tables with the results originally reported by the laboratories.

In the **parameter oriented part** the reported results and corresponding uncertainties are illustrated together with recoveries of the assigned values and the z-scores for each parameter and all laboratories. This information is presented in graphical and tabular form. Results, which were identified as outliers by the Hampel test are marked with an asterisk (\*) in the column "out". These values were not considered for the calculation of statistical parameters (mean values, standard deviations and confidence intervals). Moreover, the parameter oriented part contains the uncertainties of the assigned values. The uncertainty intervals correspond to the expanded uncertainty (coverage factor  $k = 2$ ) as described in the EURACHEM / CITAC Guide "Quantifying Uncertainty in Analytical Measurement" 3<sup>rd</sup> Edition (2012) ". The uncertainty interval of the reference concentration is illustrated in the graphs as a grey band around the 100 % recovery line.

Results, for which no recoveries could be calculated, are illustrated by one of the following symbols: **FN** (false negative), **FP** (false positive) or • - symbol.

- "FN": a result is considered false negative when the "< result" reported is lower than the corresponding assigned value, or the measured value was given as "0" when the substance was added.
- "FP": False positive results can only be obtained for compounds that were evaluated on the basis of a "< assigned value". A result is termed FP if it does not include (strike) the "< assigned value" with its measurement uncertainty.
- "•": All other results for which no recoveries can be calculated are illustrated by this symbol

### Overview of measurement methods

The participants were free to choose the analytical method. The test methods should be consistent with the methods applied in routine. An overview of the methods used can be found at the end of the report. For the parameter cadmium, the only value measured using GF-AAS was conspicuous ( $|z\text{-Score}| > 3$ ). For the parameter selenium, the only value determined using ICP-OES was also conspicuous ( $|z\text{-Score}| > 3$ ). For the parameter chromium, two values measured using ICP-OES were conspicuous as well ( $|z\text{-Score}| > 3$ ). Since only one or two values per method are available, a further statistical evaluation is not possible.

"< values" or "> values" as well as significantly different measured values, which would lead to confusing scaling, are not included in the graphics.

Tulln, 10 April 2025

**Sample M106A**  
**Parameter Copper**

\*Target value ± U (k=2) 4,79 µg/l ± 0,13 µg/l  
 IFA result ± U (k=2) 4,79 µg/l ± 0,38 µg/l  
 Stability test ± U (k=2) 4,69 µg/l ± 0,38 µg/l

*\*Target value = "assigned value"*  
*Obtained from sample preparation, U=uncertainty*  
*Determined at IFA prior to shipment of samples*  
*Determined at IFA 3 weeks after sample dispatch*

Lab Code	Result	±	Unit	Recovery	z-Score
A	5.16	0.4128	µg/l	108%	0.90
B	4.22	0.42	µg/l	88%	-1.38
C	4.45	0.13	µg/l	93%	-0.83
D			µg/l		
E			µg/l		
F	4.10	0.08	µg/l	86%	-1.68
G			µg/l		
H			µg/l		
I	4.75	0.74	µg/l	99%	-0.10
J	<5		µg/l	.	.
K	4.76		µg/l	99%	-0.07
L	<10		µg/l	.	.
M	4.8	0.5	µg/l	100%	0.02
N	3.7	0.4	µg/l	77%	-2.65
O	4.47	0.447	µg/l	93%	-0.78
P	6.0		µg/l	125%	2.94
Q	4.17	0.2	µg/l	87%	-1.51
R	4.6	0.8	µg/l	96%	-0.46
S	4.44	0.67	µg/l	93%	-0.85
T			µg/l		
U	4.675	0.935	µg/l	98%	-0.28
V	5.0	0.50	µg/l	104%	0.51
W	3.54	0.3	µg/l	74%	-3.03
X	7.108 *	0.749	µg/l	148%	5.63
Y	<10		µg/l	.	.
Z			µg/l		
AA	<3.0		µg/l	FN	
AB	3.775	0.107	µg/l	79%	-2.46
AC	<10.0		µg/l	.	.

Recovery of assigned value in percent

z-Score of the laboratory

An asterik indicates a result detected as outlier by Hampel test

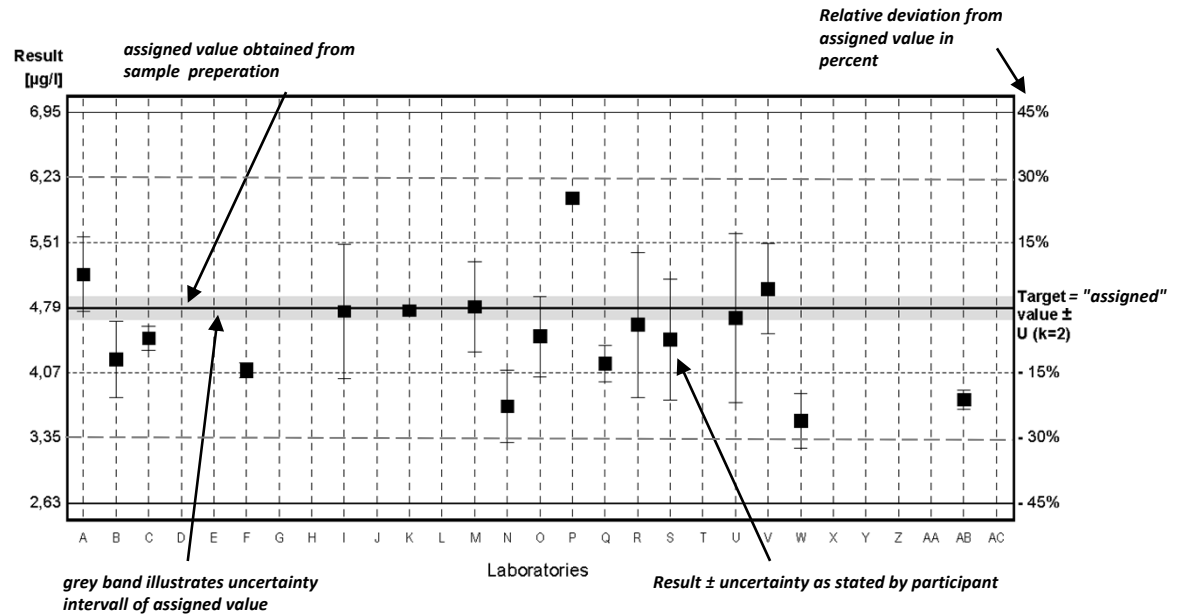
Interval expected to encompass target value as stated by participant

	All results	Outliers excl.	Unit
Mean ± CI(99%)	4,65 ± 0,57	4,51 ± 0,42	µg/l
Recov. ± CI(99%)	97,1 ± 12,0	94,1 ± 8,8	%
SD between labs	0,84	0,59	µg/l
RSD between labs	18,1	13,2	%
n for calculation	18	17	

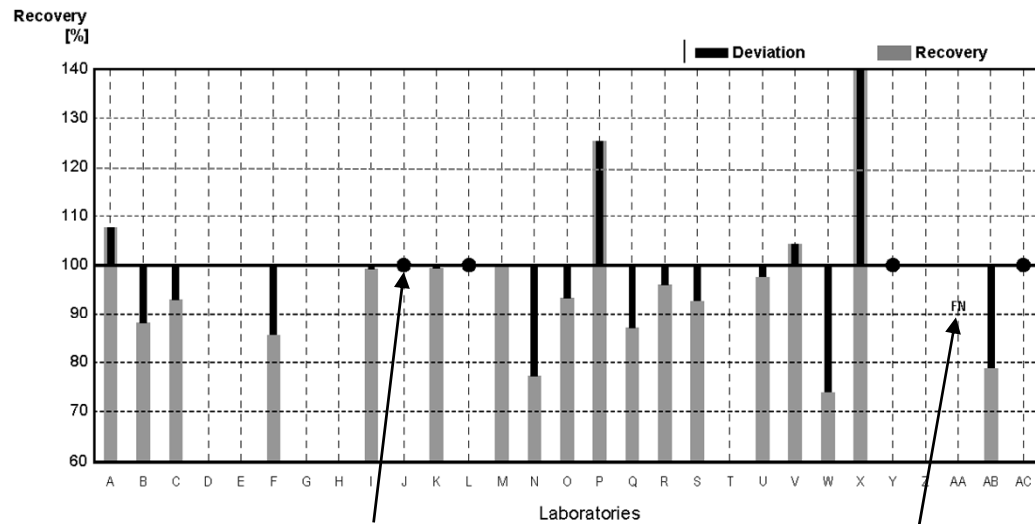
Between laboratory standard deviation

Laboratory mean and recovery of assigned value with corresponding confidence intervals (p=99%)

Number of results used for calculation of statistic parameters



**Diagram 1: Measurement results and their uncertainties**



Result neither possible to calculate recovery nor false positive or false negative

False negative: reported „<-result“ is lower than target value

**Diagram 2: Recoveries and deviations from assigned values**

**EXPLANATION**



**Rohdatenblätter und  
Parameterorientierte Auswertung  
Tables and Parameter Oriented Part**

Eignungsprüfungsrunde / Proficiency testing round  
M176

Metalle / Metals

Versand / Dispatch: 03.03.2025

## Results M176A

	Aluminium	Arsenic	Lead	Cadmium	Chromium	Iron	Copper
assigned value	32.8	2.031	3.03	0.303	3.65	18.3	7.91
IFA result	32.3	2.10	3.03	0.307	3.62	18.0	7.95
A	31.0		<6	<0.5	<5	<20	<150
B							
C	38.8	1.85	3.15	0.300	3.68	18.3	7.85
D	35.0	2.22	2.81	0.307	3.64	18.0	7.43
E	32.5	2.08	2.80	0.294	3.91	19.3	7.80
F							
G	30.7	2.16	3.05	0.303	3.56	17.7	7.82
H		2.16	2.03	0.69	3.13	8.5	9.6
I	34.656	2.195	3.039	0.311	3.703	18.548	7.829
J	31.45	2.07	2.79	0.291	3.31	<50	6.56
K			2.73				<100
L							
M	31.7	2.15	2.90	0.280	3.48	17.2	7.16
N	32.9	2.04	2.90	0.306	3.56	18.4	7.6
O	34.3	1.98	2.97	0.280	3.70	18.7	7.41
P	30.2	2.23	2.88	0.317	3.81	19.63	7.78
Q	31.4	2.06	2.84	0.280	3.62	21.0	7.55
R							
S	32.4	<5.0	3.02	<1.0	3.66	18.1	7.38
T	37.1	2.14	3.04	0.310	34.7	17.7	7.34
U	31.0					17.5	
V	33.0	2.10	3.15	0.291	3.65	18.4	7.56
W	32.8	2.07	3.01	0.307	3.58	18.0	7.67
X	33.4	1.77	2.50	0.351	3.32		6.76
Y	15.17	1.30	4.92	1.47	0.79	66.5	4.24
Z	77.53				3.936	19.97	
AA	34.817	1.887	3.075	0.297	3.514	18.497	7.703
AB	30.1	2.04	2.90	0.296	3.50	17.9	7.20
AC	35.0	2.10	2.81	0.300	3.85	20.6	7.64
AD							
AE	24.77	2.602	2.639	0.292	3.758	17.455	7.668
AF						19.3	
AG							
AH	36.0	2.10	3.00	0.310	3.60	19.0	8.40

All data in µg/L

### Measurement Uncertainties M176A

	Aluminium ±	Arsenic ±	Lead ±	Cadmium ±	Chromium ±	Iron ±	Copper ±
assigned value	0.3	0.017	0.03	0.003	0.03	0.2	0.10
IFA result	1.1	0.19	0.15	0.019	0.12	1.4	0.57
A	3.0						
B							
C	7.8	0.37	0.63	0.060	0.74	3.7	1.6
D							
E							
F							
G	0.847	0.0885	0.0430	0.00725	0.221	0.356	0.0360
H		0.13	0.10	0.03	0.16	0.8	0.5
I	4.852	0.351	0.365	0.031	0.444	2.226	1.096
J	7.86	0.62	0.84	0.07	0.99		1.64
K			0.2				
L							
M	7.9	0.54	0.73	0.07	0.87	4.3	1.79
N	4.4	0.36	0.28	0.064	0.38	1.9	0.7
O	0.52	0.081	0.015	0.020	0.18	0.72	0.080
P	5.4	0.36	0.43	0.038	0.53	2.75	1.32
Q	6.0	0.09	0.10	0.048	0.62	3.4	0.57
R							
S	5.0		0.52		0.30	1.5	2.66
T	3.7	0.315	0.304	0.031	3.47	1.77	0.734
U							
V	4.95	0.32	0.47	0.044	0.55	2.76	1.13
W	3.9	0.35	0.36	0.037	0.68	5.9	0.84
X	6.7	0.27	0.38	0.088	0.53		1.08
Y	2.28	0.16	0.69	0.18	0.12	8.65	0.55
Z							
AA	5.640	0.283	0.375	0.025	0.257	1.887	0.863
AB	6.0	0.31	0.35	0.036	0.53	2.7	0.86
AC							
AD							
AE							
AF							
AG							
AH	3.60	0.252	0.240	0.0248	0.432	4.94	0.672

All data in µg/L

## Results M176A

	Manganese	Nickel	Mercury	Selenium	Uranium	Zinc
assigned value	34.31	5.57	1.597	0.91	0.499	20.0
IFA result	33.6	5.5	1.54	1.04	0.470	24.6
A	34.2	5.5				<500
B				0.90		
C	34.3	5.50	1.38	<1	<1	20.5
D	32.7	5.39	1.49	1.04	0.422	19.9
E	36.4	5.66	1.45	1.06	0.471	20.8
F				1.24		
G	33.9	5.62	1.49	<1.00	<1.00	18.5
H	34.3	5.8	1.36	1.58		20.5
I	34.629	5.441	1.511	0.965	0.521	20.739
J	30.81	4.63	1.29	<2	0.472	<30
K	33.6	5.21				
L				0.74		
M	32.7	5.16	1.43	0.99	0.485	19.1
N	33.3	5.4	1.63	0.91	<1	19.8
O	34.9	5.34	1.53	0.925	0.461	19.1
P	35.88	5.60	1.46	<2.0	0.52	21.33
Q	34.3	5.37	1.55	0.744	0.442	24.6
R						
S	34.6	6.62		<10		19.9
T	33.0	5.28	1.54	1.00	<1	20.4
U	32.9				0.460	
V	33.3	5.52	1.71	0.96	<1	18.6
W	33.6	5.30	1.43	0.92	0.504	19.4
X		4.70				
Y	25.06	4.31	0.78	1.59	1.55	85.74
Z	33.85					
AA	33.794	5.404	1.562	0.824	0.483	19.183
AB	33.8	5.37	1.66	<1.0	0.498	19.2
AC	36.2	5.59	1.66	0.86	0.480	18.85
AD					0.462	
AE	31.10	5.429	1.616	0.752	3.400	20.82
AF	26.8					
AG						21.5
AH	35.0	5.40	1.568	1.00	0.490	20.0

All data in µg/L



## Measurement Uncertainties M176A

	Manganese ±	Nickel ±	Mercury ±	Selenium ±	Uranium ±	Zinc ±
assigned value	0.17	0.05	0.017	0.02	0.006	3.6
IFA result	2.2	0.2	0.25	0.14	0.046	3.6
A	3.4	0.8				
B				0.065		
C	6.9	1.1	0.28			4.1
D						
E						
F				0.25		
G	0.527	0.0883	0.017			0.153
H	1.9	0.3	0.26	0.07		1.4
I	3.463	0.653	0.272	0.154	0.052	2.489
J	9.24	1.16	0.39		0.142	
K	2.9	0.4				
L				0.09		
M	8.2	1.29	0.43	0.25	0.121	4.8
N	1.7	0.5	0.28	0.29		2.6
O	0.50	0.11	0.017	0.025	0.008	0.21
P	3.95	0.90	0.32		0.06	3.41
Q	5.5	0.35	0.47	0.208	0.075	4.4
R						
S	3.3	0.81				2.8
T	3.3	0.53	0.15	0.15		2.04
U						
V	5.00	0.83	0.26	0.14		2.79
W	3.7	0.90	0.26	0.31	0.206	3.1
X		0.71				
Y	2.76	0.52	0.172	0.19	0.26	14.58
Z						
AA	2.805	0.519	0.073	0.124	0.069	2.877
AB	4.1	0.59	0.37		0.075	2.9
AC						
AD					0.072	
AE						
AF						
AG						
AH	3.50	0.540	0.2352	0.150	0.025	2.00

All data in µg/L

## Results M176B

	Aluminium	Arsenic	Lead	Cadmium	Chromium	Iron	Copper
assigned value	15.07	1.302	5.02	1.516	0.800	68.8	4.07
IFA result	15.0	1.36	4.75	1.54	0.82	67	4.00
A	<20		<6	1.46	<5	67	<150
B							
C	18.3	1.18	5.30	1.43	<1	69.3	4.13
D	15.4	1.39	4.64	1.51	0.97	64.4	3.65
E	16.06	1.35	4.67	1.55	0.815	72.0	3.94
F							
G	13.6	1.35	5.02	1.51	<1.00	68.3	4.08
H		1.34	4.06	1.89	0.281	57	7.3
I	15.892	1.405	5.000	1.548	0.819	70.541	4.012
J	12.77	<2	4.65	1.41	<1	70.03	3.58
K			4.47				<100
L							
M	14.4	1.39	4.82	1.44	0.763	64.8	3.67
N	16.4	1.34	4.83	1.57	<1	67.3	4.01
O	15.7	1.25	4.95	1.51	0.877	68.8	3.88
P	16.28	1.46	4.55	1.58	0.84	73.88	3.97
Q	14.9	1.34	4.68	1.39	0.805	71.6	3.94
R							
S	15.3	<5.0	4.99	1.546	<2.0	68.8	<5
T	17.4	1.41	4.97	1.55	<1	66.1	3.72
U	12.8					65.5	
V	15.1	1.36	5.06	1.49	<1	67.8	3.92
W	14.9	1.36	4.95	1.53	0.783	68.4	3.82
X	19.1	1.12	4.90	2.03	0.780		3.58
Y	35.08	1.91	3.06	0.300	3.58	18.44	8.03
Z	35.73				0.9031	70.83	
AA	16.248	1.205	5.102	1.491	0.746	69.073	3.952
AB	13.4	1.28	4.77	1.51	<1.0	65.3	3.70
AC	17.0	1.38	4.62	1.49	0.85	72.6	3.85
AD							
AE	8.471	1.210	3.384	1.466	0.650	56.167	3.990
AF						70	
AG							
AH	19.0	1.40	4.90	1.50	0.800	69.0	3.90

All data in µg/L

### Measurement Uncertainties M176B

	Aluminium ±	Arsenic ±	Lead ±	Cadmium ±	Chromium ±	Iron ±	Copper ±
assigned value	0.18	0.013	0.03	0.012	0.011	0.3	0.03
IFA result	0.6	0.13	0.24	0.10	0.06	5	0.29
A				0.16		11	
B							
C	3.7	0.24	1.1	0.29		14	0.83
D							
E							
F							
G	0.929	0.0928	0.0407	0.100		0.320	0.0344
H		0.08	0.21	0.09	0.015	6	0.4
I	2.225	0.225	0.600	0.155	0.098	8.465	0.562
J	3.19		1.39	0.35		21.01	0.89
K			0.4				
L							
M	3.6	0.35	1.21	0.36	0.191	16.2	0.92
N	2.6	0.32	0.44	0.16		5.9	0.48
O	0.25	0.043	0.026	0.074	0.056	2.1	0.040
P	2.93	0.23	0.68	0.19	0.12	10.34	0.67
Q	2.8	0.06	0.16	0.24	0.137	11.5	0.30
R							
S	2.4		0.85	0.110		5.8	
T	1.7	0.21	0.497	0.155		6.61	0.37
U							
V	2.27	0.20	0.76	0.22		10.2	0.59
W	2.5	0.23	0.59	0.18	0.149	12.3	0.42
X	3.8	0.17	0.74	0.51	0.125		0.57
Y	5.26	0.23	0.43	0.04	0.54	2.40	1.04
Z							
AA	2.632	0.181	0.626	0.125	0.054	7.045	0.443
AB	2.7	0.19	0.57	0.18		9.8	0.44
AC							
AD							
AE							
AF							
AG							
AH	1.90	0.168	0.392	0.120	0.096	17.94	0.312

All data in µg/L

## Results M176B

	Manganese	Nickel	Mercury	Selenium	Uranium	Zinc
assigned value	26.27	4.16	0.856	1.61	1.713	81
IFA result	25.3	4.07	0.72	1.82	1.52	77
A	25.8	<5				<500
B				1.69		
C	26.5	4.10	0.675	1.45	1.625	83.3
D	25.1	4.08	0.75	1.79	1.56	79.9
E	27.5	4.22	0.77	1.78	1.57	84.4
F				2.28		
G	25.7	4.28	0.791	1.59	1.68	75.9
H	26.0	4.50	0.78	2.11		79
I	26.357	4.067	0.790	1.679	1.767	82.865
J	23.38	3.58	0.65	<2	1.87	75.99
K	26.2	3.70				
L				1.345		
M	24.9	3.81	0.74	1.73	1.62	76.2
N	25.4	3.90	0.84	1.58	1.64	78.8
O	26.4	4.00	0.849	1.55	1.57	79.1
P	27.2	4.25	0.78	<5.0	1.65	86.50
Q	25.9	4.05	0.823	1.44	1.46	97.5
R						
S	26.6	<5.0		<10		79.5
T	24.6	3.86	0.84	1.77	1.80	82.1
U	25.4				1.53	
V	25.0	4.17	0.92	1.67	1.73	78.4
W	25.5	3.91	0.776	1.61	1.73	76.5
X		3.42				
Y	32.23	5.55	1.46	0.91	0.470	21.34
Z	25.00					
AA	26.006	3.994	0.832	1.495	1.656	78.498
AB	26.1	4.06	0.890	1.51	1.66	78.1
AC	27.7	4.20	0.88	1.40	1.62	75.0
AD					1.582	
AE	23.40	3.909	0.850	<10	4.515	81.92
AF	20.0					
AG						85.4
AH	26.0	4.00	0.863	1.80	1.62	80.0

All data in µg/L

## Measurement Uncertainties M176B

	Manganese ±	Nickel ±	Mercury ±	Selenium ±	Uranium ±	Zinc ±
assigned value	0.15	0.04	0.014	0.02	0.015	4
IFA result	1.6	0.19	0.12	0.24	0.15	9
A	3.6					
B				0.12		
C	5.3	0.82	0.14	0.29	0.325	16
D						
E						
F				0.46		
G	0.547	0.0896	0.017	0.106	0.141	0.149
H	1.4	0.26	0.15	0.10		5
I	2.636	0.488	0.142	0.269	0.177	9.944
J	7.01	0.89	0.19		0.56	22.80
K	2.3	0.3				
L				0.16		
M	6.2	0.95	0.22	0.43	0.40	19.1
N	1.4	0.45	0.15	0.37	0.20	9.1
O	0.40	0.095	0.008	0.040	0.021	0.59
P	3.0	0.68	0.17		0.20	13.84
Q	4.1	0.26	0.247	0.40	0.25	17.6
R						
S	2.5					11.1
T	2.46	0.386	0.084	0.27	0.18	8.21
U						
V	3.75	0.63	0.14	0.25	0.26	11.8
W	2.8	0.66	0.140	0.55	0.71	9.9
X		0.51				
Y	3.55	0.67	0.32	0.11	0.08	3.63
Z						
AA	2.158	0.383	0.039	0.224	0.237	11.775
AB	3.1	0.45	0.20	0.23	0.25	12
AC						
AD					0.250	
AE						
AF						
AG						
AH	2.60	0.400	0.129	0.270	0.081	8.00

All data in µg/L

## z-Scores M176A

	Aluminium	Arsenic	Lead	Cadmium	Chromium	Iron	Copper
A	-0.73						
B							
C	2.44	-1.35	0.61	-0.20	0.14	0.00	-0.10
D	0.89	1.41	-1.12	0.26	-0.05	-0.26	-0.83
E	-0.12	0.37	-1.17	-0.59	1.21	0.85	-0.19
F							
G	-0.85	0.96	0.10	0.00	-0.42	-0.51	-0.16
H		0.96	-5.08	25.54	-2.41	-8.37	2.93
I	0.75	1.22	0.05	0.53	0.25	0.21	-0.14
J	-0.55	0.29	-1.22	-0.79	-1.58		-2.34
K			-1.52				
L							
M	-0.45	0.89	-0.66	-1.52	-0.79	-0.94	-1.30
N	0.04	0.07	-0.66	0.20	-0.42	0.09	-0.54
O	0.61	-0.38	-0.30	-1.52	0.23	0.34	-0.87
P	-1.06	1.48	-0.76	0.92	0.74	1.14	-0.23
Q	-0.57	0.22	-0.96	-1.52	-0.14	2.31	-0.62
R							
S	-0.16		-0.05		0.05	-0.17	-0.92
T	1.75	0.81	0.05	0.46	144.18	-0.51	-0.99
U	-0.73					-0.68	
V	0.08	0.51	0.61	-0.79	0.00	0.09	-0.61
W	0.00	0.29	-0.10	0.26	-0.33	-0.26	-0.42
X	0.24	-1.95	-2.69	3.17	-1.53		-1.99
Y	-7.17	-5.45	9.60	77.03	-13.28	41.15	-6.36
Z	18.18				1.33	1.43	
AA	0.82	-1.07	0.23	-0.40	-0.63	0.17	-0.36
AB	-1.10	0.07	-0.66	-0.46	-0.70	-0.34	-1.23
AC	0.89	0.51	-1.12	-0.20	0.93	1.96	-0.47
AD							
AE	-3.26	4.26	-1.99	-0.73	0.50	-0.72	-0.42
AF						0.85	
AG							
AH	1.30	0.51	-0.15	0.46	-0.23	0.60	0.85

## z-Scores M176A

	Manganese	Nickel	Mercury	Selenium	Uranium	Zinc
A	-0.06	-0.20				
B				-0.13		
C	-0.01	-0.20	-1.24			0.38
D	-0.92	-0.50	-0.61	1.68	-2.86	-0.08
E	1.19	0.25	-0.84	1.94	-1.04	0.62
F				4.27		
G	-0.23	0.14	-0.61			-1.15
H	-0.01	0.65	-1.35	8.66		0.38
I	0.18	-0.36	-0.49	0.71	0.82	0.57
J	-2.00	-2.64	-1.75		-1.00	
K	-0.41	-1.01				
L				-2.20		
M	-0.92	-1.15	-0.95	1.03	-0.52	-0.69
N	-0.58	-0.48	0.19	0.00		-0.15
O	0.34	-0.65	-0.38	0.19	-1.41	-0.69
P	0.90	0.08	-0.78		0.78	1.02
Q	-0.01	-0.56	-0.27	-2.15	-2.12	3.54
R						
S	0.17	2.95				-0.08
T	-0.75	-0.81	-0.32	1.16		0.31
U	-0.81				-1.45	
V	-0.58	-0.14	0.64	0.65		-1.08
W	-0.41	-0.76	-0.95	0.13	0.19	-0.46
X		-2.44				
Y	-5.29	-3.53	-4.65	8.79	39.00	50.57
Z	-0.26					
AA	-0.29	-0.47	-0.20	-1.11	-0.59	-0.63
AB	-0.29	-0.56	0.36		-0.04	-0.62
AC	1.08	0.06	0.36	-0.65	-0.71	-0.88
AD					-1.37	
AE	-1.83	-0.40	0.11	-2.04	107.66	0.63
AF	-4.29					
AG						1.15
AH	0.39	-0.48	-0.17	1.16	-0.33	0.00

## z-Scores M176B

	Aluminium	Arsenic	Lead	Cadmium	Chromium	Iron	Copper
A				-0.74		-0.41	
B							
C	2.86	-1.42	0.86	-1.13		0.11	0.20
D	0.29	1.02	-1.16	-0.08	3.60	-1.00	-1.41
E	0.88	0.56	-1.07	0.45	0.32	0.73	-0.44
F							
G	-1.30	0.56	0.00	-0.08		-0.11	0.03
H		0.44	-2.94	4.93	-11.00	-2.68	10.87
I	0.73	1.20	-0.06	0.42	0.40	0.40	-0.20
J	-2.03		-1.13	-1.40		0.28	-1.65
K			-1.69				
L							
M	-0.59	1.02	-0.61	-1.00	-0.78	-0.91	-1.35
N	1.18	0.44	-0.58	0.71		-0.34	-0.20
O	0.56	-0.61	-0.21	-0.08	1.63	0.00	-0.64
P	1.07	1.84	-1.44	0.84	0.85	1.15	-0.34
Q	-0.15	0.44	-1.04	-1.66	0.11	0.64	-0.44
R							
S	0.20		-0.09	0.40		0.00	
T	2.06	1.26	-0.15	0.45		-0.61	-1.18
U	-2.01					-0.75	
V	0.03	0.67	0.12	-0.34		-0.23	-0.50
W	-0.15	0.67	-0.21	0.18	-0.36	-0.09	-0.84
X	3.57	-2.12	-0.37	6.78	-0.42		-1.65
Y	17.70	7.08	-6.01	-16.04	58.90	-11.44	13.33
Z	18.28				2.18	0.46	
AA	1.04	-1.13	0.25	-0.33	-1.14	0.06	-0.40
AB	-1.48	-0.26	-0.77	-0.08		-0.79	-1.25
AC	1.71	0.91	-1.23	-0.34	1.06	0.86	-0.74
AD							
AE	-5.84	-1.07	-5.01	-0.66	-3.18	-2.87	-0.27
AF						0.27	
AG							
AH	3.48	1.14	-0.37	-0.21	0.00	0.05	-0.57



## z-Scores M176B

	Manganese	Nickel	Mercury	Selenium	Uranium	Zinc
A	-0.35					
B				0.58		
C	0.17	-0.23	-1.92	-1.17	-0.95	0.44
D	-0.87	-0.30	-1.13	1.32	-1.65	-0.21
E	0.92	0.23	-0.91	1.24	-1.55	0.65
F				4.90		
G	-0.43	0.45	-0.69	-0.15	-0.36	-0.97
H	-0.20	1.28	-0.81	3.65		-0.38
I	0.06	-0.35	-0.70	0.50	0.58	0.35
J	-2.16	-2.18	-2.19		1.70	-0.95
K	-0.05	-1.73				
L				-1.94		
M	-1.02	-1.31	-1.23	0.88	-1.01	-0.91
N	-0.65	-0.98	-0.17	-0.22	-0.79	-0.42
O	0.10	-0.60	-0.07	-0.44	-1.55	-0.36
P	0.69	0.34	-0.81		-0.68	1.04
Q	-0.28	-0.41	-0.35	-1.24	-2.74	3.13
R						
S	0.25					-0.28
T	-1.25	-1.13	-0.17	1.17	0.94	0.21
U	-0.65				-1.98	
V	-0.95	0.04	0.68	0.44	0.18	-0.49
W	-0.57	-0.94	-0.85	0.00	0.18	-0.85
X		-2.78				
Y	4.45	5.22	6.41	-5.12	-13.44	-11.33
Z	-0.95					
AA	-0.20	-0.62	-0.25	-0.84	-0.62	-0.48
AB	-0.13	-0.38	0.36	-0.73	-0.57	-0.55
AC	1.07	0.15	0.25	-1.53	-1.01	-1.14
AD					-1.42	
AE	-2.14	-0.94	-0.06		30.29	0.17
AF	-4.68					
AG						0.84
AH	-0.20	-0.60	0.07	1.39	-1.01	-0.19

# Sample M176A

## Parameter Aluminium

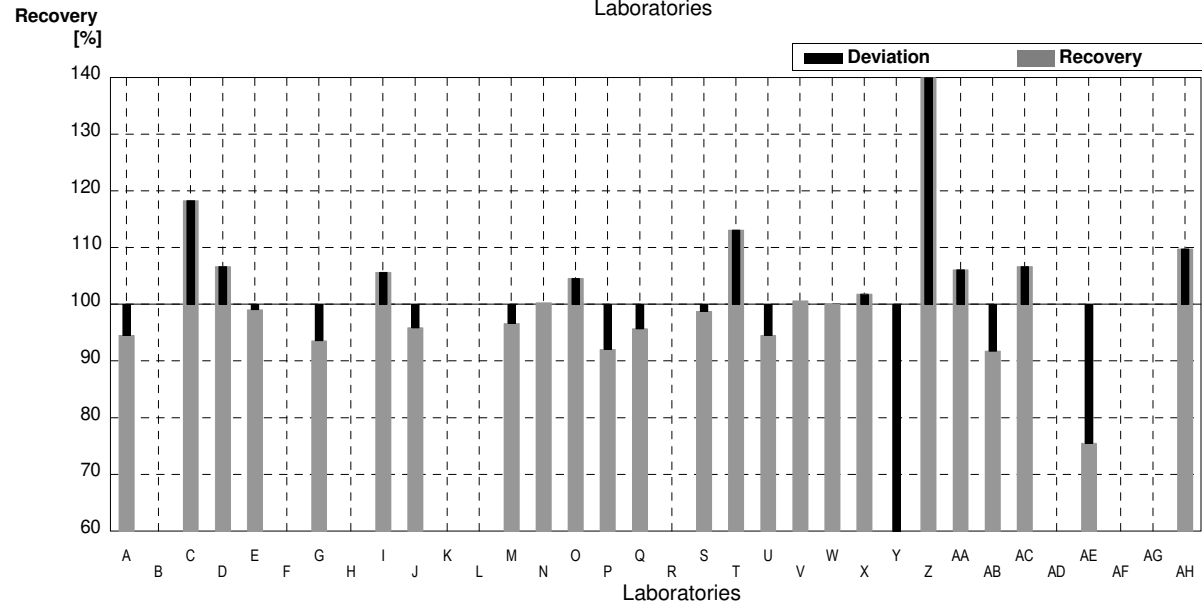
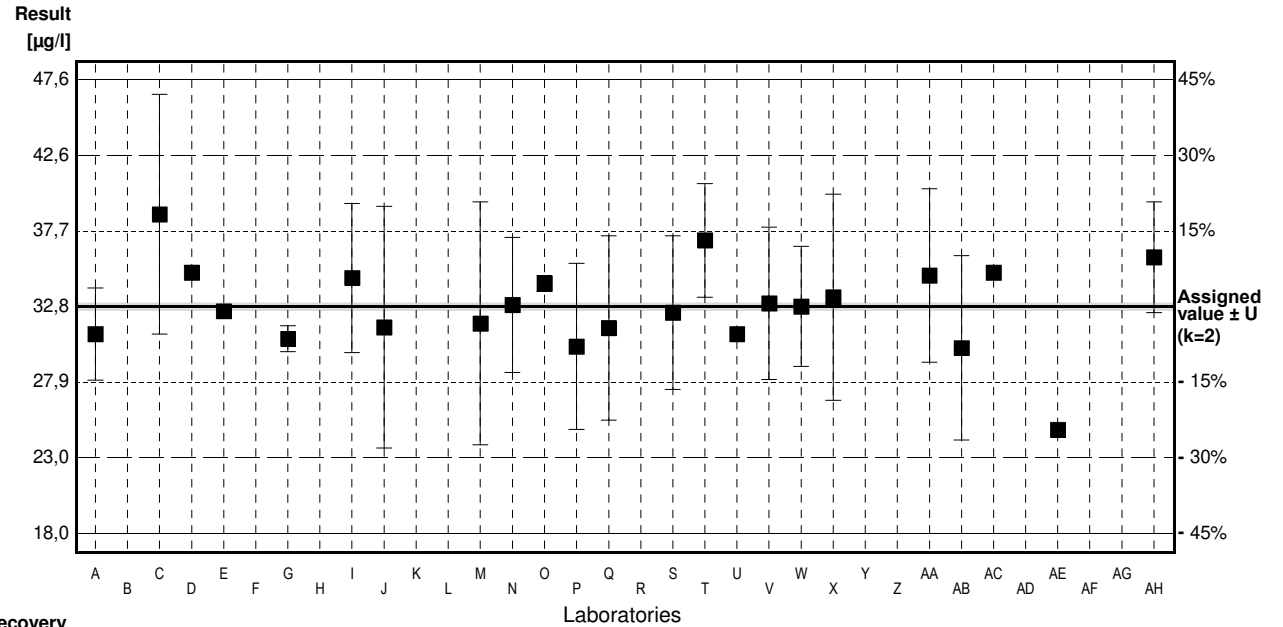
Assigned value ± U (k=2) 32,8 µg/l ± 0,3 µg/l

IFA result ± U (k=2) 32,3 µg/l ± 1,1 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	31,0	3,0	µg/l	95%	-0,73
B			µg/l		
C	38,8	7,8	µg/l	118%	2,44
D	35,0		µg/l	107%	0,89
E	32,5		µg/l	99%	-0,12
F			µg/l		
G	30,7	0,847	µg/l	94%	-0,85
H			µg/l		
I	34,656	4,852	µg/l	106%	0,75
J	31,45	7,86	µg/l	96%	-0,55
K			µg/l		
L			µg/l		
M	31,7	7,9	µg/l	97%	-0,45
N	32,9	4,4	µg/l	100%	0,04
O	34,3	0,52	µg/l	105%	0,61
P	30,2	5,4	µg/l	92%	-1,06
Q	31,4	6,0	µg/l	96%	-0,57
R			µg/l		
S	32,4	5,0	µg/l	99%	-0,16
T	37,1	3,7	µg/l	113%	1,75
U	31,0		µg/l	95%	-0,73
V	33,0	4,95	µg/l	101%	0,08
W	32,8	3,9	µg/l	100%	0,00
X	33,4	6,7	µg/l	102%	0,24
Y	15,17 *	2,28	µg/l	46%	-7,17
Z	77,53 *		µg/l	236%	18,18
AA	34,817	5,640	µg/l	106%	0,82
AB	30,1	6,0	µg/l	92%	-1,10
AC	35,0		µg/l	107%	0,89
AD			µg/l		
AE	24,77		µg/l	76%	-3,26
AF			µg/l		
AG			µg/l		
AH	36,0	3,60	µg/l	110%	1,30

	All results	Outliers excl.	Unit
Mean ± CI(99%)	33,9 ± 5,7	32,8 ± 1,7	µg/l
Recov. ± CI(99%)	103,4 ± 17,3	100,1 ± 5,1	%
SD between labs	10,1	2,9	µg/l
RSD between labs	29,9	8,7	%
n for calculation	25	23	



# Sample M176B

## Parameter Aluminium

Assigned value ± U (k=2) 15,07 µg/l ± 0,18 µg/l

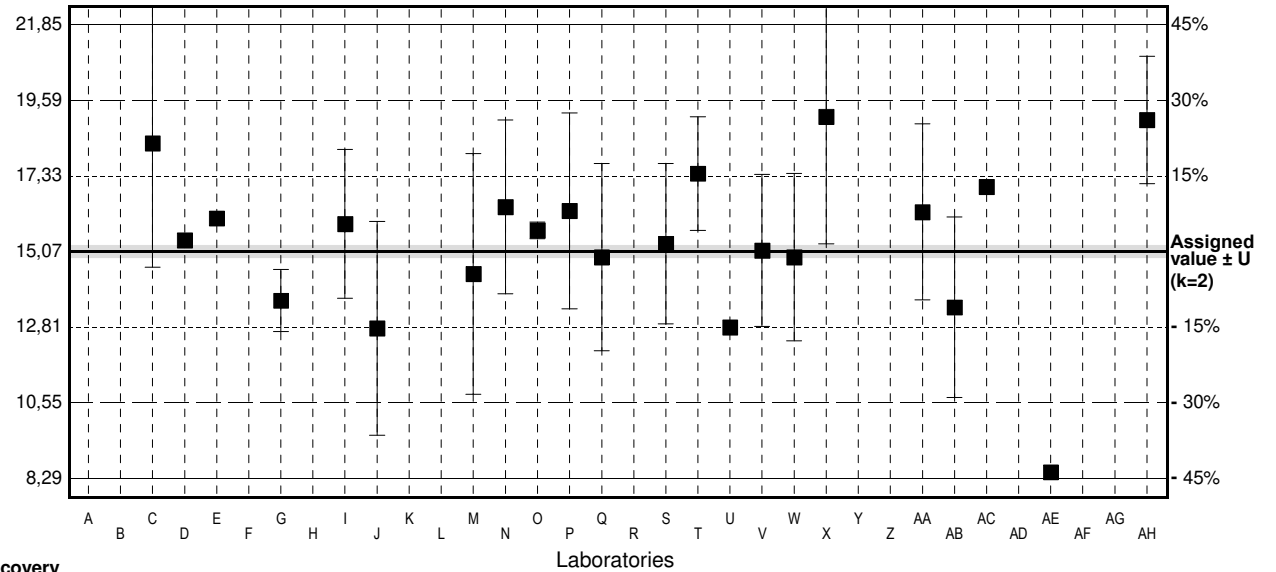
IFA result ± U (k=2) 15,0 µg/l ± 0,6 µg/l

Stability test µg/l

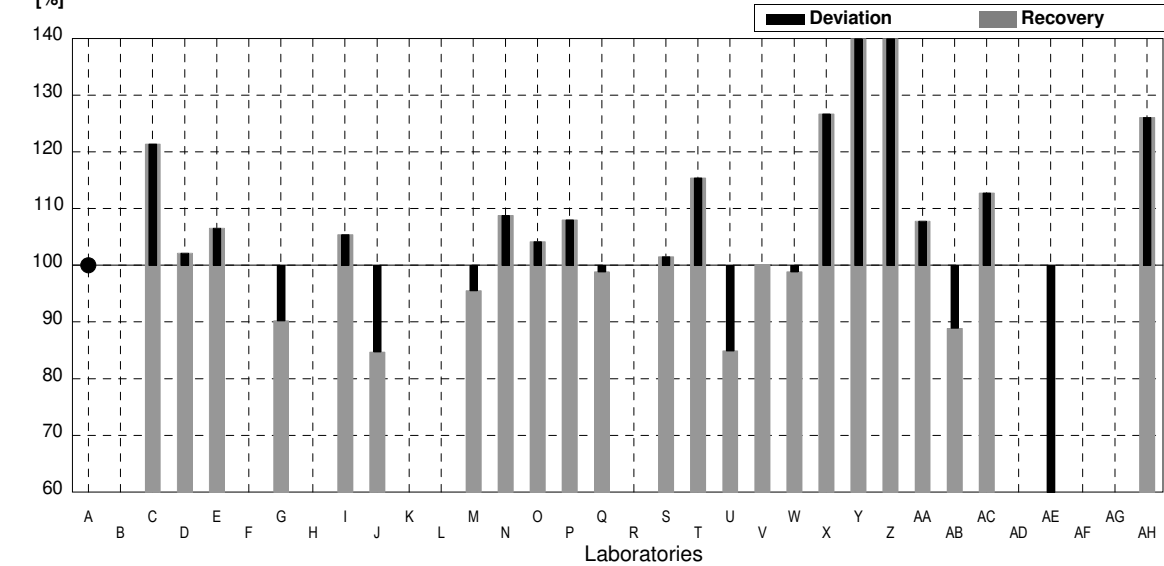
Lab Code	Result	±	Unit	Recovery	z-Score
A	<20		µg/l	*	
B			µg/l		
C	18,3	3,7	µg/l	121%	2,86
D	15,4		µg/l	102%	0,29
E	16,06		µg/l	107%	0,88
F			µg/l		
G	13,6	0,929	µg/l	90%	-1,30
H			µg/l		
I	15,892	2,225	µg/l	105%	0,73
J	12,77	3,19	µg/l	85%	-2,03
K			µg/l		
L			µg/l		
M	14,4	3,6	µg/l	96%	-0,59
N	16,4	2,6	µg/l	109%	1,18
O	15,7	0,25	µg/l	104%	0,56
P	16,28	2,93	µg/l	108%	1,07
Q	14,9	2,8	µg/l	99%	-0,15
R			µg/l		
S	15,3	2,4	µg/l	102%	0,20
T	17,4	1,7	µg/l	115%	2,06
U	12,8		µg/l	85%	-2,01
V	15,1	2,27	µg/l	100%	0,03
W	14,9	2,5	µg/l	99%	-0,15
X	19,1	3,8	µg/l	127%	3,57
Y	35,08 *	5,26	µg/l	233%	17,70
Z	35,73 *		µg/l	237%	18,28
AA	16,248	2,632	µg/l	108%	1,04
AB	13,4	2,7	µg/l	89%	-1,48
AC	17,0		µg/l	113%	1,71
AD			µg/l		
AE	8,471 *		µg/l	56%	-5,84
AF			µg/l		
AG			µg/l		
AH	19,0	1,90	µg/l	126%	3,48

	All results	Outliers excl.	Unit
Mean ± CI(99%)	17,05 ± 3,49	15,71 ± 1,12	µg/l
Recov. ± CI(99%)	113,1 ± 23,1	104,3 ± 7,5	%
SD between labs	6,08	1,81	µg/l
RSD between labs	35,7	11,5	%
n for calculation	24	21	

Result [µg/l]



Recovery [%]



# Sample M176A

## Parameter Arsenic

Assigned value  $\pm U$  (k=2) 2,031  $\mu\text{g/l}$   $\pm$  0,017  $\mu\text{g/l}$

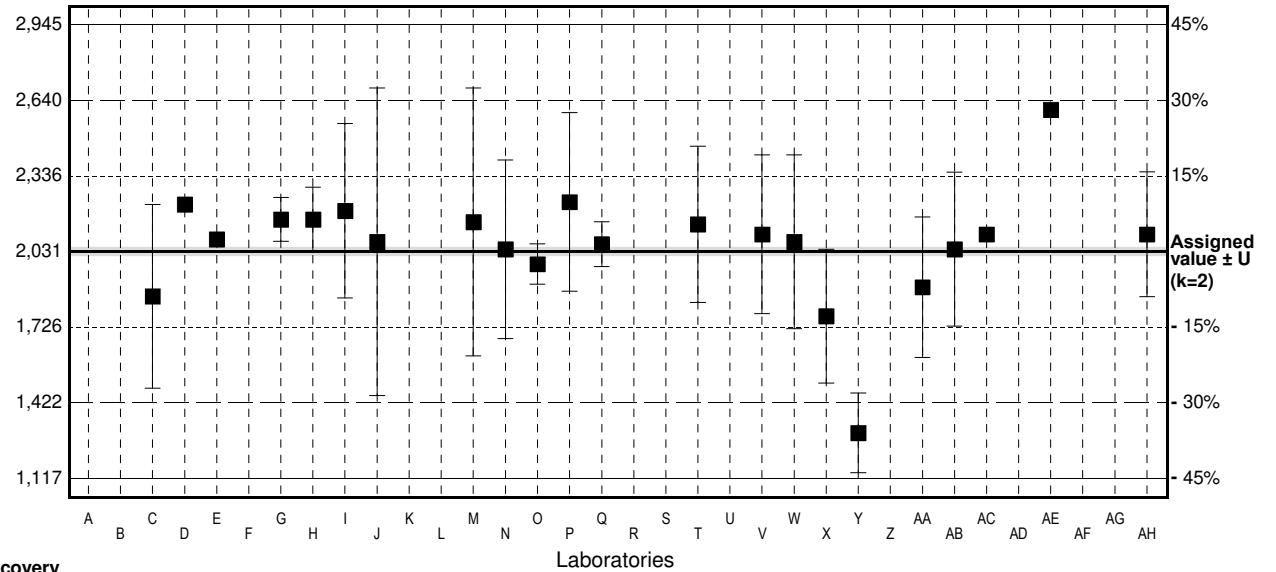
IFA result  $\pm U$  (k=2) 2,10  $\mu\text{g/l}$   $\pm$  0,19  $\mu\text{g/l}$

Stability test  $\mu\text{g/l}$

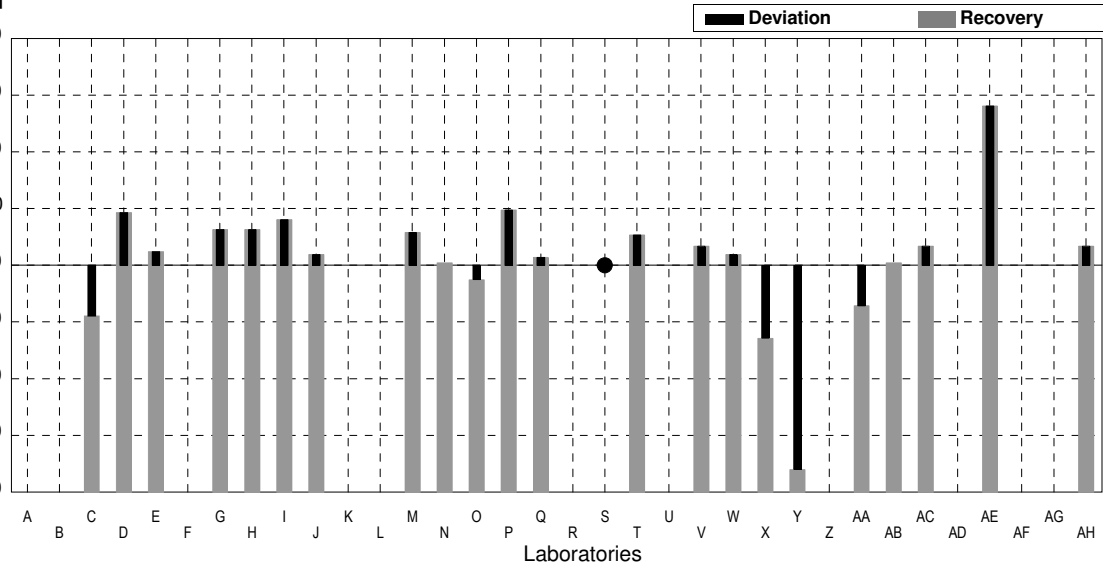
Lab Code	Result	$\pm$	Unit	Recovery	z-Score
A			$\mu\text{g/l}$		
B			$\mu\text{g/l}$		
C	1,85	0,37	$\mu\text{g/l}$	91%	-1,35
D	2,22		$\mu\text{g/l}$	109%	1,41
E	2,08		$\mu\text{g/l}$	102%	0,37
F			$\mu\text{g/l}$		
G	2,16	0,0885	$\mu\text{g/l}$	106%	0,96
H	2,16	0,13	$\mu\text{g/l}$	106%	0,96
I	2,195	0,351	$\mu\text{g/l}$	108%	1,22
J	2,07	0,62	$\mu\text{g/l}$	102%	0,29
K			$\mu\text{g/l}$		
L			$\mu\text{g/l}$		
M	2,15	0,54	$\mu\text{g/l}$	106%	0,89
N	2,04	0,36	$\mu\text{g/l}$	100%	0,07
O	1,98	0,081	$\mu\text{g/l}$	97%	-0,38
P	2,23	0,36	$\mu\text{g/l}$	110%	1,48
Q	2,06	0,09	$\mu\text{g/l}$	101%	0,22
R			$\mu\text{g/l}$		
S	<5,0		$\mu\text{g/l}$	*	
T	2,14	0,315	$\mu\text{g/l}$	105%	0,81
U			$\mu\text{g/l}$		
V	2,10	0,32	$\mu\text{g/l}$	103%	0,51
W	2,07	0,35	$\mu\text{g/l}$	102%	0,29
X	1,77	*	0,27	87%	-1,95
Y	1,30	*	0,16	64%	-5,45
Z			$\mu\text{g/l}$		
AA	1,887	0,283	$\mu\text{g/l}$	93%	-1,07
AB	2,04	0,31	$\mu\text{g/l}$	100%	0,07
AC	2,10		$\mu\text{g/l}$	103%	0,51
AD			$\mu\text{g/l}$		
AE	2,602	*	$\mu\text{g/l}$	128%	4,26
AF			$\mu\text{g/l}$		
AG			$\mu\text{g/l}$		
AH	2,10	0,252	$\mu\text{g/l}$	103%	0,51

	All results	Outliers excl.	Unit
Mean $\pm$ CI(99%)	2,059 $\pm$ 0,141	2,086 $\pm$ 0,066	$\mu\text{g/l}$
Recov. $\pm$ CI(99%)	101,4 $\pm$ 6,9	102,7 $\pm$ 3,3	%
SD between labs	0,234	0,100	$\mu\text{g/l}$
RSD between labs	11,4	4,8	%
n for calculation	22	19	

Result  
[ $\mu\text{g/l}$ ]



Recovery  
[%]



# Sample M176B

## Parameter Arsenic

Assigned value ± U (k=2) 1,302 µg/l ± 0,013 µg/l

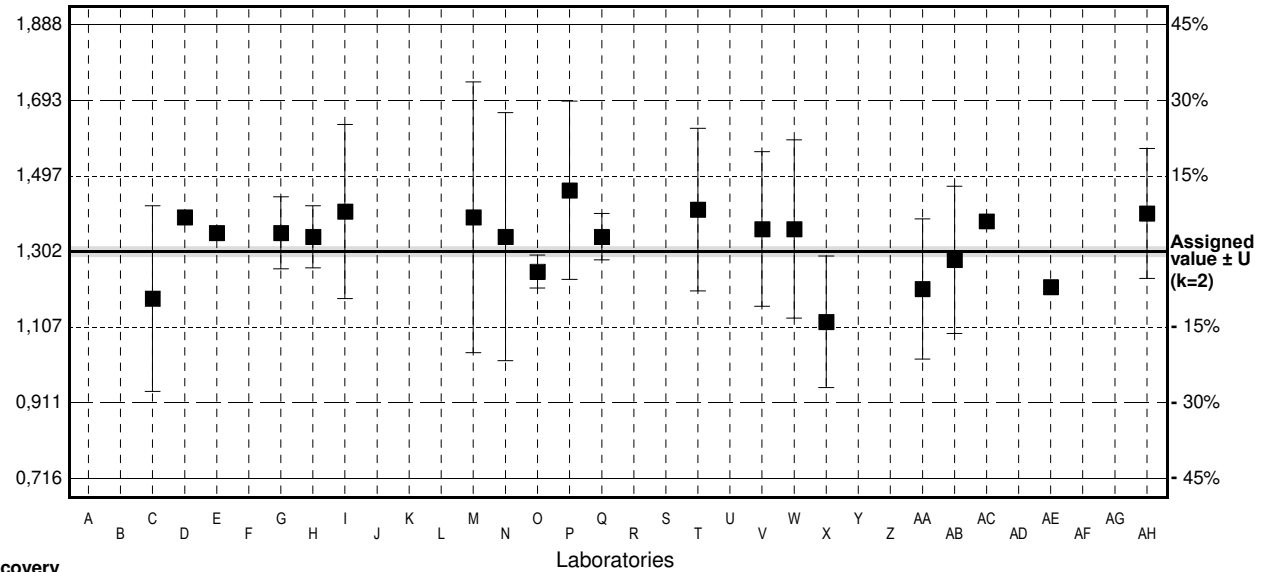
IFA result ± U (k=2) 1,36 µg/l ± 0,13 µg/l

Stability test µg/l

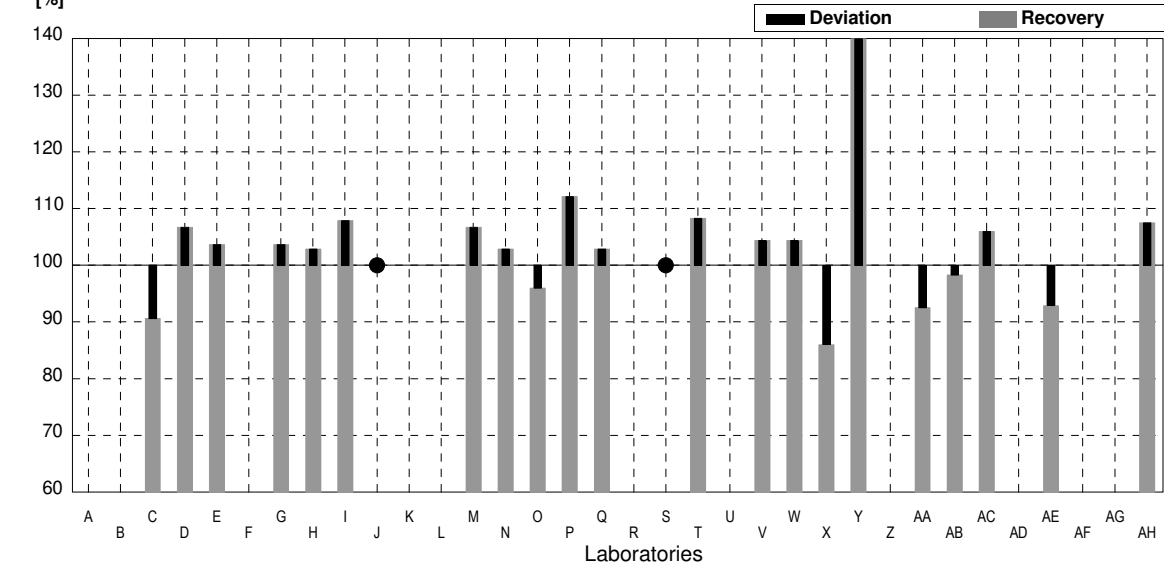
Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B			µg/l		
C	1,18	0,24	µg/l	91%	-1,42
D	1,39		µg/l	107%	1,02
E	1,35		µg/l	104%	0,56
F			µg/l		
G	1,35	0,0928	µg/l	104%	0,56
H	1,34	0,08	µg/l	103%	0,44
I	1,405	0,225	µg/l	108%	1,20
J	<2		µg/l	*	
K			µg/l		
L			µg/l		
M	1,39	0,35	µg/l	107%	1,02
N	1,34	0,32	µg/l	103%	0,44
O	1,25	0,043	µg/l	96%	-0,61
P	1,46	0,23	µg/l	112%	1,84
Q	1,34	0,06	µg/l	103%	0,44
R			µg/l		
S	<5,0		µg/l	*	
T	1,41	0,21	µg/l	108%	1,26
U			µg/l		
V	1,36	0,20	µg/l	104%	0,67
W	1,36	0,23	µg/l	104%	0,67
X	1,12	0,17	µg/l	86%	-2,12
Y	1,91	0,23	µg/l	147%	7,08
Z			µg/l		
AA	1,205	0,181	µg/l	93%	-1,13
AB	1,28	0,19	µg/l	98%	-0,26
AC	1,38		µg/l	106%	0,91
AD			µg/l		
AE	1,210		µg/l	93%	-1,07
AF			µg/l		
AG			µg/l		
AH	1,40	0,168	µg/l	108%	1,14

	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,354 ± 0,096	1,326 ± 0,057	µg/l
Recov. ± CI(99%)	104,0 ± 7,4	101,8 ± 4,4	%
SD between labs	0,154	0,089	µg/l
RSD between labs	11,4	6,7	%
n for calculation	21	20	

Result [µg/l]



Recovery [%]



# Sample M176A

## Parameter Lead

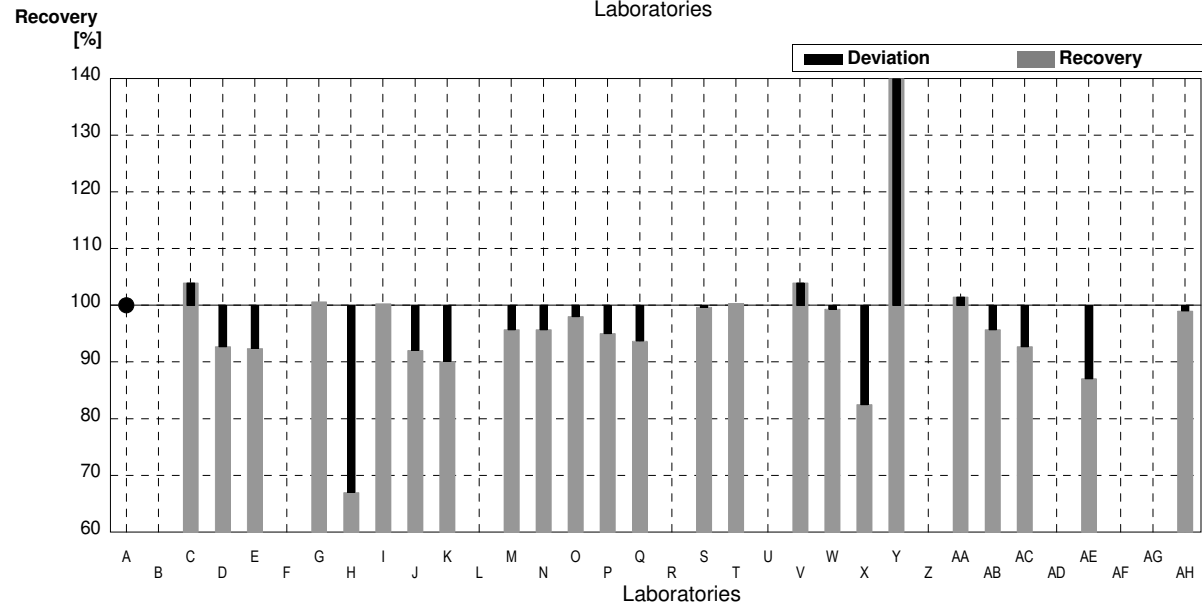
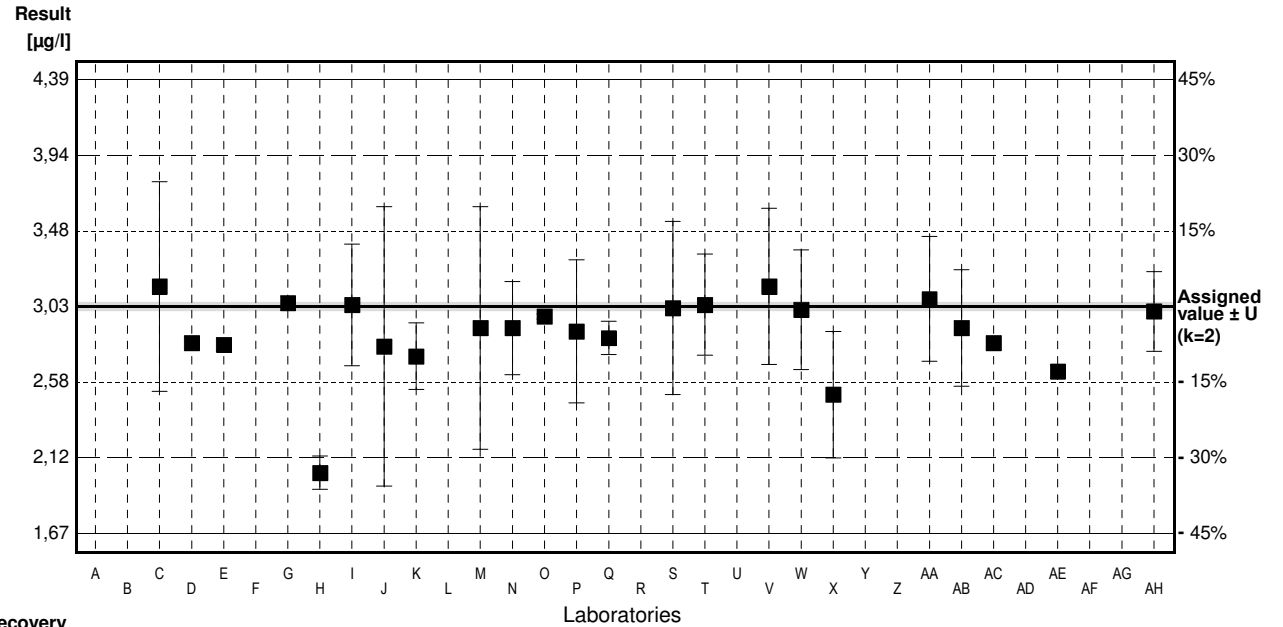
Assigned value ± U (k=2) 3,03 µg/l ± 0,03 µg/l

IFA result ± U (k=2) 3,03 µg/l ± 0,15 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<6		µg/l	*	
B			µg/l		
C	3,15	0,63	µg/l	104%	0,61
D	2,81		µg/l	93%	-1,12
E	2,80		µg/l	92%	-1,17
F			µg/l		
G	3,05	0,0430	µg/l	101%	0,10
H	2,03 *	0,10	µg/l	67%	-5,08
I	3,039	0,365	µg/l	100%	0,05
J	2,79	0,84	µg/l	92%	-1,22
K	2,73	0,2	µg/l	90%	-1,52
L			µg/l		
M	2,90	0,73	µg/l	96%	-0,66
N	2,90	0,28	µg/l	96%	-0,66
O	2,97	0,015	µg/l	98%	-0,30
P	2,88	0,43	µg/l	95%	-0,76
Q	2,84	0,10	µg/l	94%	-0,96
R			µg/l		
S	3,02	0,52	µg/l	100%	-0,05
T	3,04	0,304	µg/l	100%	0,05
U			µg/l		
V	3,15	0,47	µg/l	104%	0,61
W	3,01	0,36	µg/l	99%	-0,10
X	2,50	0,38	µg/l	83%	-2,69
Y	4,92 *	0,69	µg/l	162%	9,60
Z			µg/l		
AA	3,075	0,375	µg/l	101%	0,23
AB	2,90	0,35	µg/l	96%	-0,66
AC	2,81		µg/l	93%	-1,12
AD			µg/l		
AE	2,639		µg/l	87%	-1,99
AF			µg/l		
AG			µg/l		
AH	3,00	0,240	µg/l	99%	-0,15

	All results	Outliers excl.	Unit
Mean ± CI(99%)	2,96 ± 0,28	2,91 ± 0,10	µg/l
Recov. ± CI(99%)	97,6 ± 9,1	96,0 ± 3,2	%
SD between labs	0,48	0,16	µg/l
RSD between labs	16,3	5,6	%
n for calculation	24	22	



# Sample M176B

## Parameter Lead

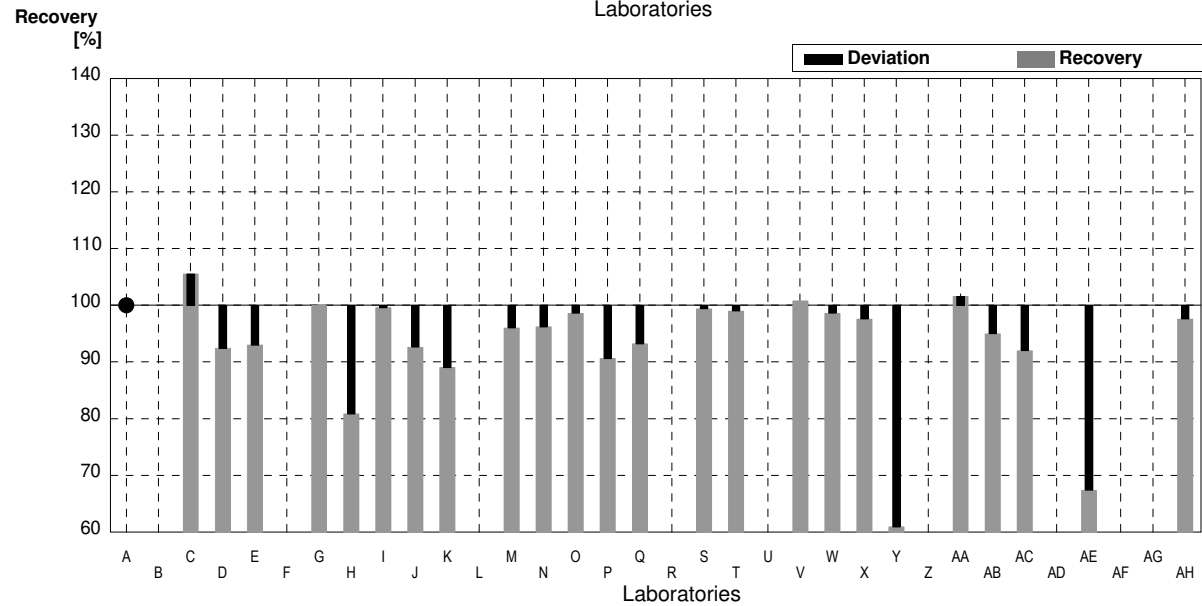
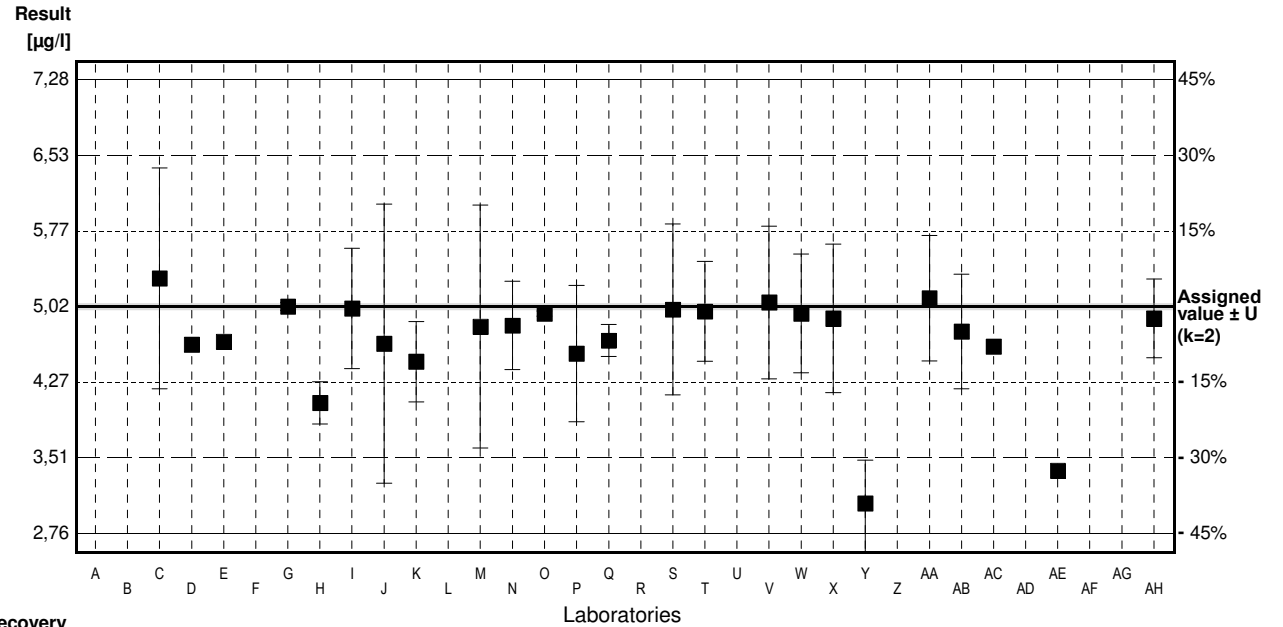
Assigned value ± U (k=2) 5,02 µg/l ± 0,03 µg/l

IFA result ± U (k=2) 4,75 µg/l ± 0,24 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<6		µg/l	*	
B			µg/l		
C	5,30	1,1	µg/l	106%	0,86
D	4,64		µg/l	92%	-1,16
E	4,67		µg/l	93%	-1,07
F			µg/l		
G	5,02	0,0407	µg/l	100%	0,00
H	4,06	0,21	µg/l	81%	-2,94
I	5,000	0,600	µg/l	100%	-0,06
J	4,65	1,39	µg/l	93%	-1,13
K	4,47	0,4	µg/l	89%	-1,69
L			µg/l		
M	4,82	1,21	µg/l	96%	-0,61
N	4,83	0,44	µg/l	96%	-0,58
O	4,95	0,026	µg/l	99%	-0,21
P	4,55	0,68	µg/l	91%	-1,44
Q	4,68	0,16	µg/l	93%	-1,04
R			µg/l		
S	4,99	0,85	µg/l	99%	-0,09
T	4,97	0,497	µg/l	99%	-0,15
U			µg/l		
V	5,06	0,76	µg/l	101%	0,12
W	4,95	0,59	µg/l	99%	-0,21
X	4,90	0,74	µg/l	98%	-0,37
Y	3,06 *	0,43	µg/l	61%	-6,01
Z			µg/l		
AA	5,102	0,626	µg/l	102%	0,25
AB	4,77	0,57	µg/l	95%	-0,77
AC	4,62		µg/l	92%	-1,23
AD			µg/l		
AE	3,384 *		µg/l	67%	-5,01
AF			µg/l		
AG			µg/l		
AH	4,90	0,392	µg/l	98%	-0,37

	All results	Outliers excl.	Unit
Mean ± CI(99%)	4,68 ± 0,30	4,81 ± 0,16	µg/l
Recov. ± CI(99%)	93,2 ± 5,9	95,9 ± 3,2	%
SD between labs	0,52	0,26	µg/l
RSD between labs	11,0	5,5	%
n for calculation	24	22	



# Sample M176A

## Parameter Cadmium

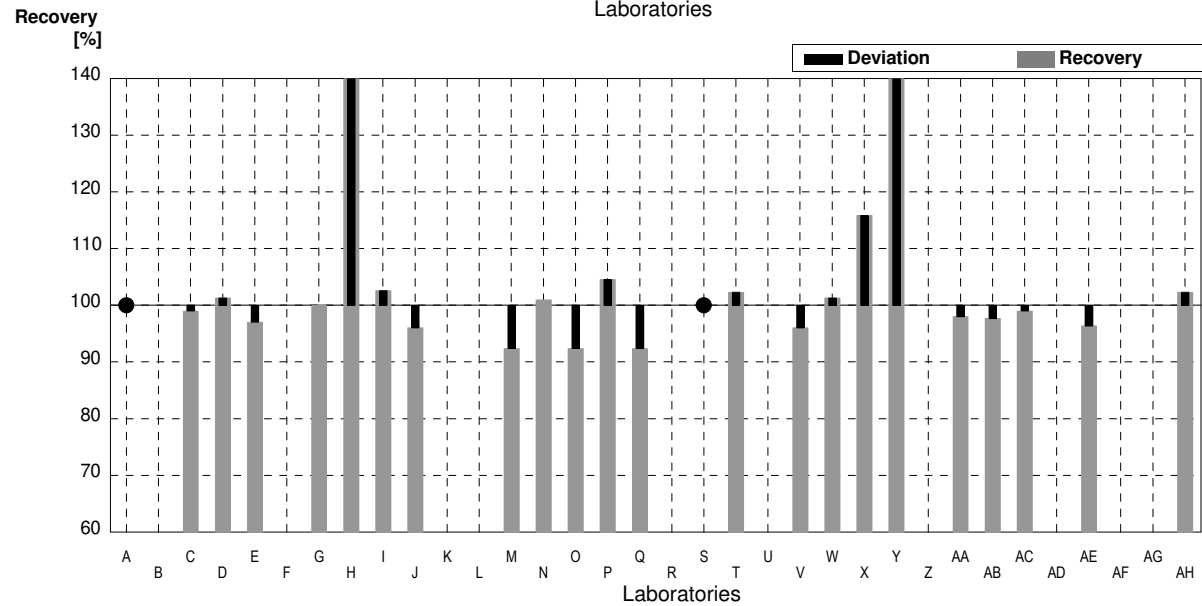
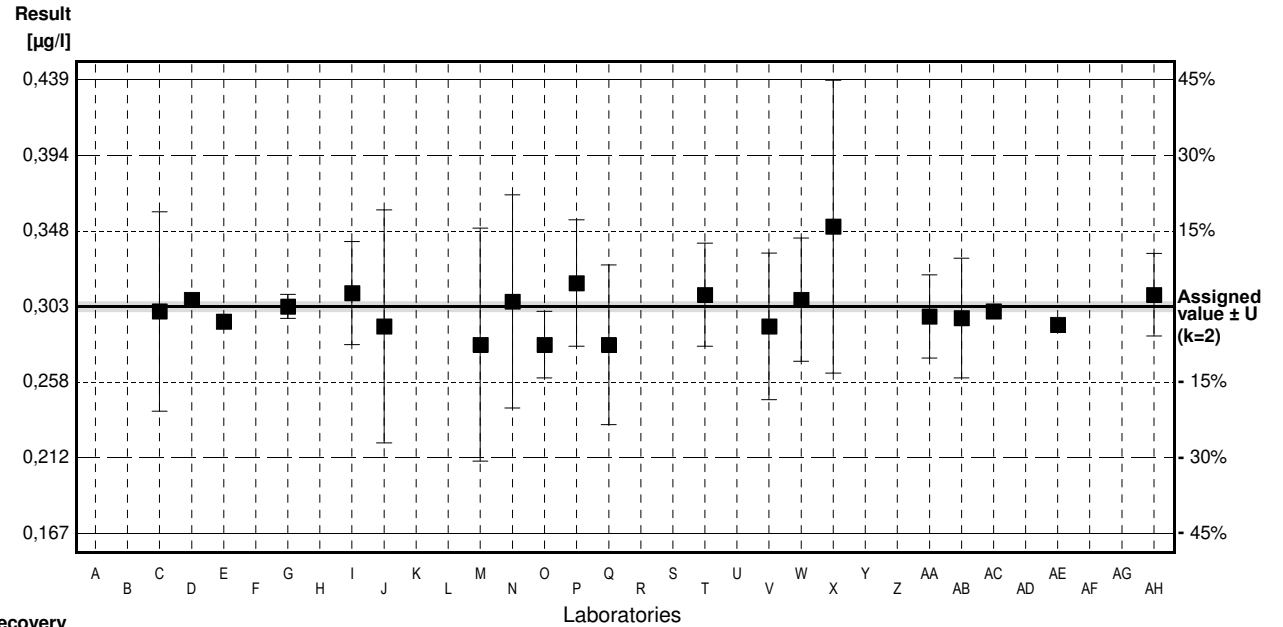
Assigned value ± U (k=2) 0,303 µg/l ± 0,003 µg/l

IFA result ± U (k=2) 0,307 µg/l ± 0,019 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<0,5		µg/l	*	
B			µg/l		
C	0,300	0,060	µg/l	99%	-0,20
D	0,307		µg/l	101%	0,26
E	0,294		µg/l	97%	-0,59
F			µg/l		
G	0,303	0,00725	µg/l	100%	0,00
H	0,69	0,03	µg/l	228%	25,54
I	0,311	0,031	µg/l	103%	0,53
J	0,291	0,07	µg/l	96%	-0,79
K			µg/l		
L			µg/l		
M	0,280	0,07	µg/l	92%	-1,52
N	0,306	0,064	µg/l	101%	0,20
O	0,280	0,020	µg/l	92%	-1,52
P	0,317	0,038	µg/l	105%	0,92
Q	0,280	0,048	µg/l	92%	-1,52
R			µg/l		
S	<1,0		µg/l	*	
T	0,310	0,031	µg/l	102%	0,46
U			µg/l		
V	0,291	0,044	µg/l	96%	-0,79
W	0,307	0,037	µg/l	101%	0,26
X	0,351	0,088	µg/l	116%	3,17
Y	1,47	0,18	µg/l	485%	77,03
Z			µg/l		
AA	0,297	0,025	µg/l	98%	-0,40
AB	0,296	0,036	µg/l	98%	-0,46
AC	0,300		µg/l	99%	-0,20
AD			µg/l		
AE	0,292		µg/l	96%	-0,73
AF			µg/l		
AG			µg/l		
AH	0,310	0,0248	µg/l	102%	0,46

	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,372 ± 0,156	0,299 ± 0,007	µg/l
Recov. ± CI(99%)	122,8 ± 51,6	98,5 ± 2,4	%
SD between labs	0,259	0,011	µg/l
RSD between labs	69,7	3,7	%
n for calculation	22	19	





# Sample M176B

## Parameter Cadmium

Assigned value ± U (k=2) 1,516 µg/l ± 0,012 µg/l

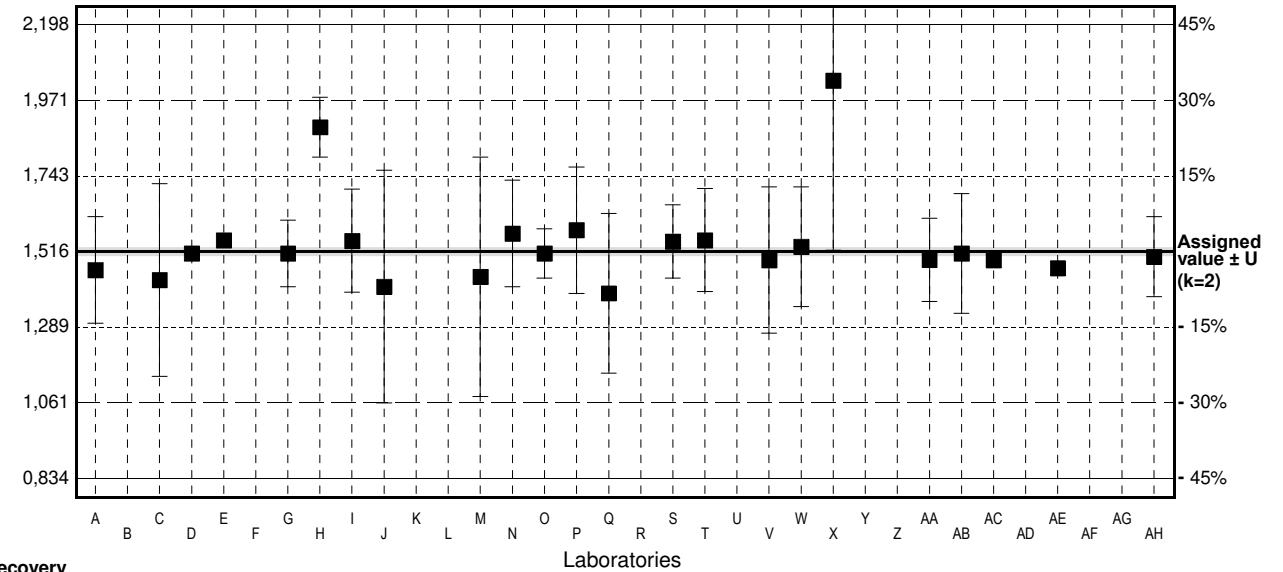
IFA result ± U (k=2) 1,54 µg/l ± 0,10 µg/l

Stability test µg/l

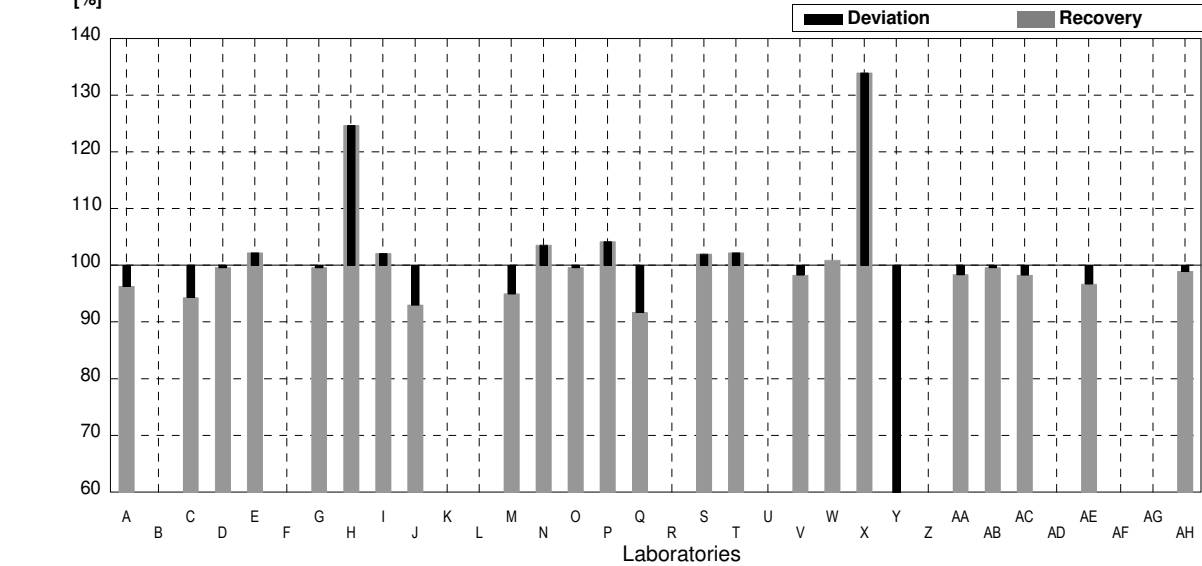
Lab Code	Result	±	Unit	Recovery	z-Score
A	1,46	0,16	µg/l	96%	-0,74
B			µg/l		
C	1,43	0,29	µg/l	94%	-1,13
D	1,51		µg/l	100%	-0,08
E	1,55		µg/l	102%	0,45
F			µg/l		
G	1,51	0,100	µg/l	100%	-0,08
H	1,89 *	0,09	µg/l	125%	4,93
I	1,548	0,155	µg/l	102%	0,42
J	1,41	0,35	µg/l	93%	-1,40
K			µg/l		
L			µg/l		
M	1,44	0,36	µg/l	95%	-1,00
N	1,57	0,16	µg/l	104%	0,71
O	1,51	0,074	µg/l	100%	-0,08
P	1,58	0,19	µg/l	104%	0,84
Q	1,39	0,24	µg/l	92%	-1,66
R			µg/l		
S	1,546	0,110	µg/l	102%	0,40
T	1,55	0,155	µg/l	102%	0,45
U			µg/l		
V	1,49	0,22	µg/l	98%	-0,34
W	1,53	0,18	µg/l	101%	0,18
X	2,03 *	0,51	µg/l	134%	6,78
Y	0,300 *	0,04	µg/l	20%	-16,04
Z			µg/l		
AA	1,491	0,125	µg/l	98%	-0,33
AB	1,51	0,18	µg/l	100%	-0,08
AC	1,49		µg/l	98%	-0,34
AD			µg/l		
AE	1,466		µg/l	97%	-0,66
AF			µg/l		
AG			µg/l		
AH	1,50	0,120	µg/l	99%	-0,21

	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,488 ± 0,166	1,499 ± 0,032	µg/l
Recov. ± CI(99%)	98,1 ± 10,9	98,9 ± 2,1	%
SD between labs	0,289	0,052	µg/l
RSD between labs	19,4	3,5	%
n for calculation	24	21	

Result [µg/l]



Recovery [%]



# Sample M176A

## Parameter Chromium

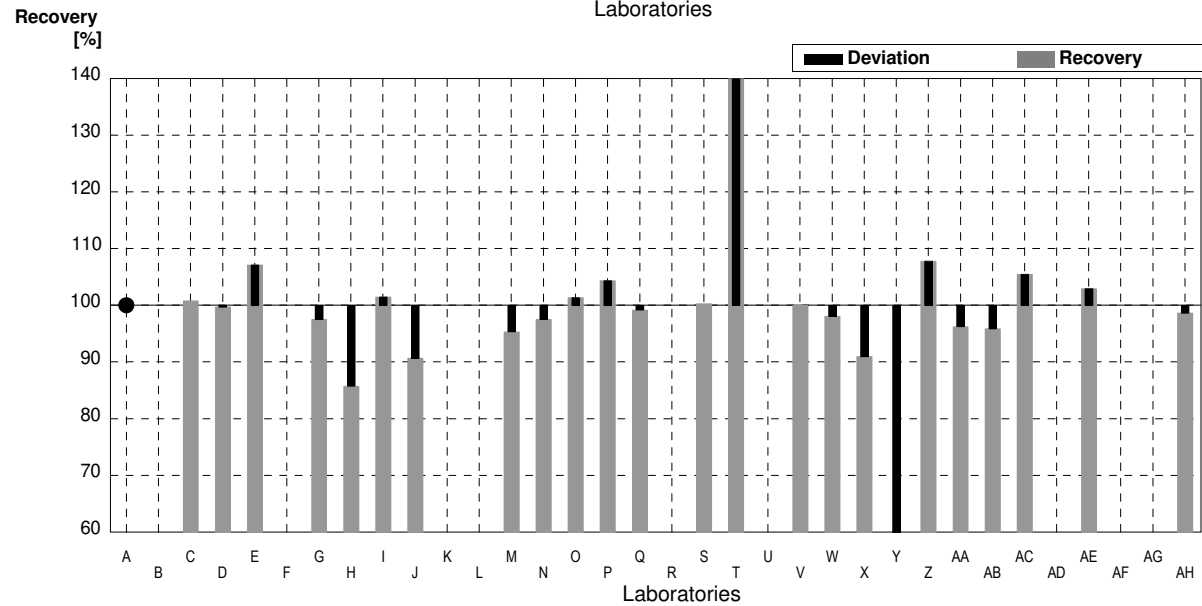
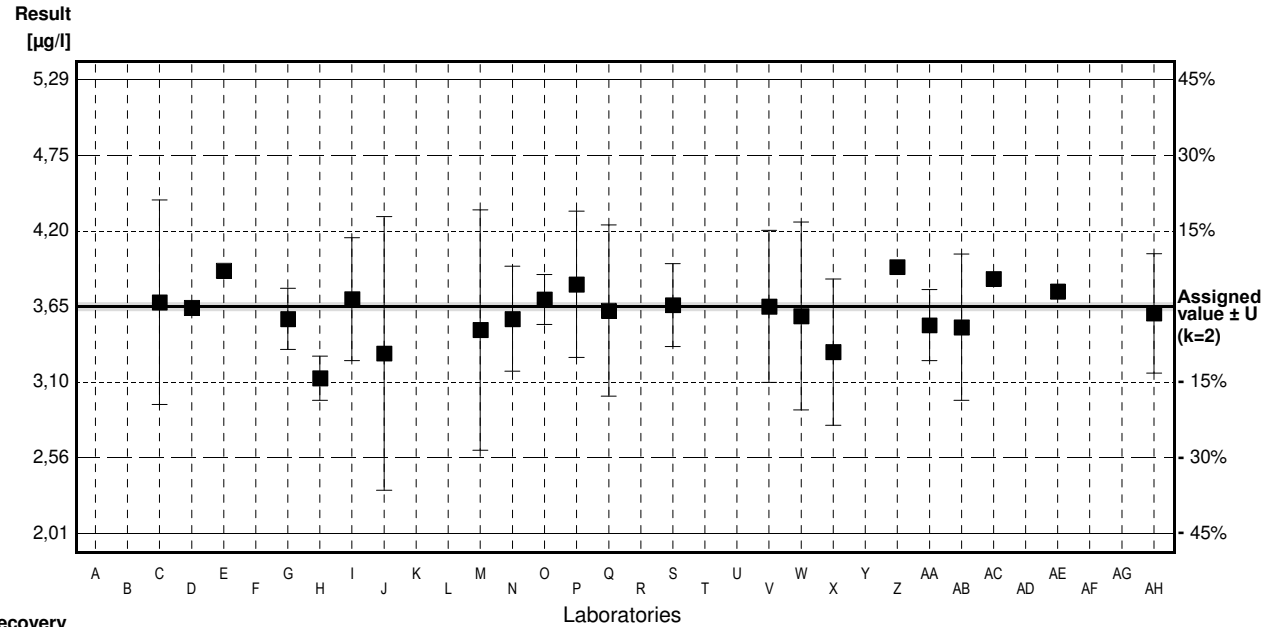
Assigned value ± U (k=2) 3,65 µg/l ± 0,03 µg/l

IFA result ± U (k=2) 3,62 µg/l ± 0,12 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5		µg/l	*	
B			µg/l		
C	3,68	0,74	µg/l	101%	0,14
D	3,64		µg/l	100%	-0,05
E	3,91		µg/l	107%	1,21
F			µg/l		
G	3,56	0,221	µg/l	98%	-0,42
H	3,13	0,16	µg/l	86%	-2,41
I	3,703	0,444	µg/l	101%	0,25
J	3,31	0,99	µg/l	91%	-1,58
K			µg/l		
L			µg/l		
M	3,48	0,87	µg/l	95%	-0,79
N	3,56	0,38	µg/l	98%	-0,42
O	3,70	0,18	µg/l	101%	0,23
P	3,81	0,53	µg/l	104%	0,74
Q	3,62	0,62	µg/l	99%	-0,14
R			µg/l		
S	3,66	0,30	µg/l	100%	0,05
T	34,7 *	3,47	µg/l	951%	144,18
U			µg/l		
V	3,65	0,55	µg/l	100%	0,00
W	3,58	0,68	µg/l	98%	-0,33
X	3,32	0,53	µg/l	91%	-1,53
Y	0,79 *	0,12	µg/l	22%	-13,28
Z	3,936		µg/l	108%	1,33
AA	3,514	0,257	µg/l	96%	-0,63
AB	3,50	0,53	µg/l	96%	-0,70
AC	3,85		µg/l	105%	0,93
AD			µg/l		
AE	3,758		µg/l	103%	0,50
AF			µg/l		
AG			µg/l		
AH	3,60	0,432	µg/l	99%	-0,23

	All results	Outliers excl.	Unit
Mean ± CI(99%)	4,79 ± 3,67	3,61 ± 0,12	µg/l
Recov. ± CI(99%)	131,2 ± 100,6	99,0 ± 3,2	%
SD between labs	6,40	0,19	µg/l
RSD between labs	133,6	5,4	%
n for calculation	24	22	



# Sample M176B

## Parameter Chromium

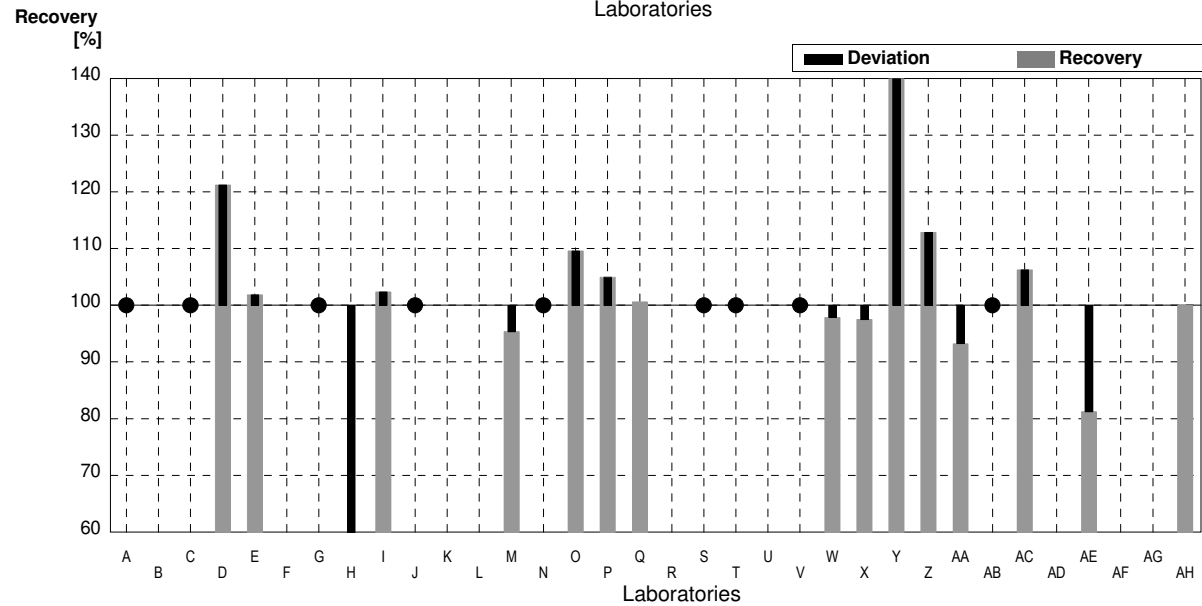
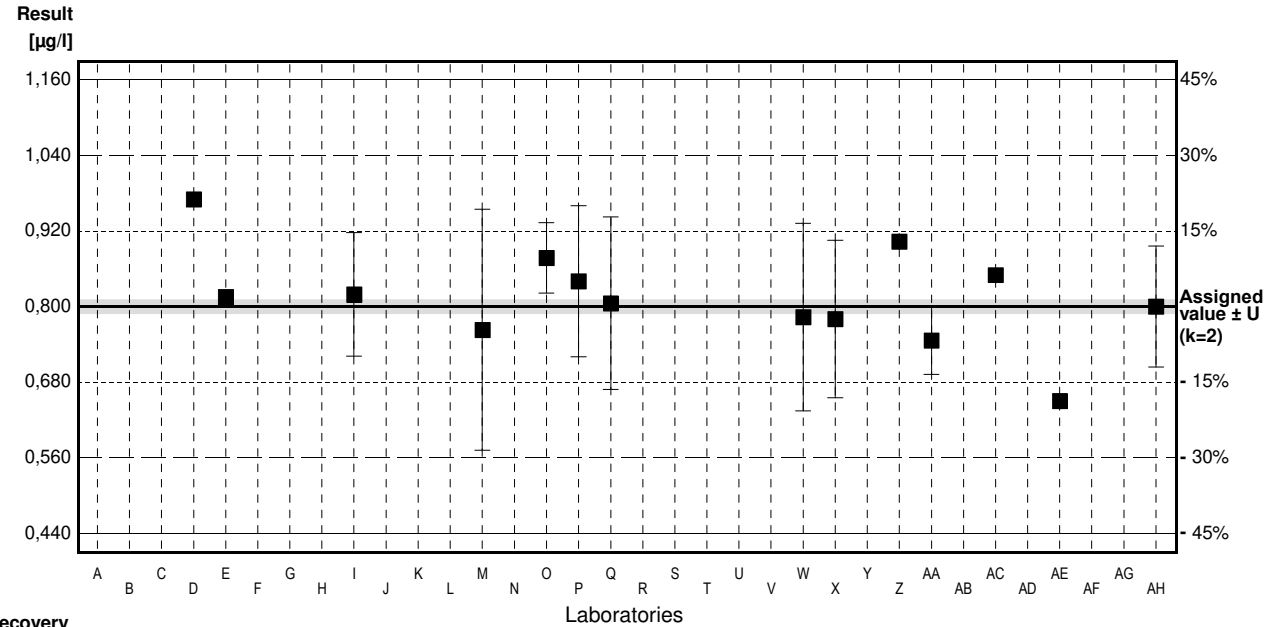
Assigned value ± U (k=2) 0,800 µg/l ± 0,011 µg/l

IFA result ± U (k=2) 0,82 µg/l ± 0,06 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5		µg/l	•	
B			µg/l		
C	<1		µg/l	•	
D	0,97		µg/l	121%	3,60
E	0,815		µg/l	102%	0,32
F			µg/l		
G	<1,00		µg/l	•	
H	0,281 *	0,015	µg/l	35%	-11,00
I	0,819	0,098	µg/l	102%	0,40
J	<1		µg/l	•	
K			µg/l		
L			µg/l		
M	0,763	0,191	µg/l	95%	-0,78
N	<1		µg/l	•	
O	0,877	0,056	µg/l	110%	1,63
P	0,84	0,12	µg/l	105%	0,85
Q	0,805	0,137	µg/l	101%	0,11
R			µg/l		
S	<2,0		µg/l	•	
T	<1		µg/l	•	
U			µg/l		
V	<1		µg/l	•	
W	0,783	0,149	µg/l	98%	-0,36
X	0,780	0,125	µg/l	98%	-0,42
Y	3,58 *	0,54	µg/l	448%	58,90
Z	0,9031		µg/l	113%	2,18
AA	0,746	0,054	µg/l	93%	-1,14
AB	<1,0		µg/l	•	
AC	0,85		µg/l	106%	1,06
AD			µg/l		
AE	0,650		µg/l	81%	-3,18
AF			µg/l		
AG			µg/l		
AH	0,800	0,096	µg/l	100%	0,00

	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,954 ± 0,528	0,814 ± 0,061	µg/l
Recov. ± CI(99%)	119,2 ± 66,0	101,8 ± 7,6	%
SD between labs	0,716	0,076	µg/l
RSD between labs	75,1	9,3	%
n for calculation	16	14	



# Sample M176A

## Parameter Iron

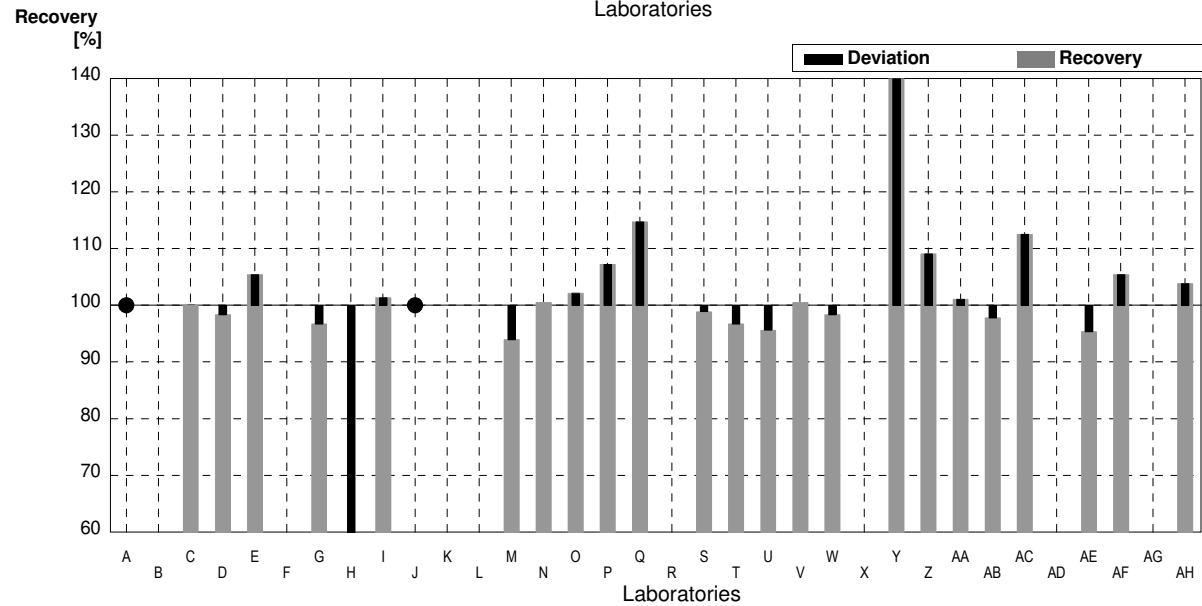
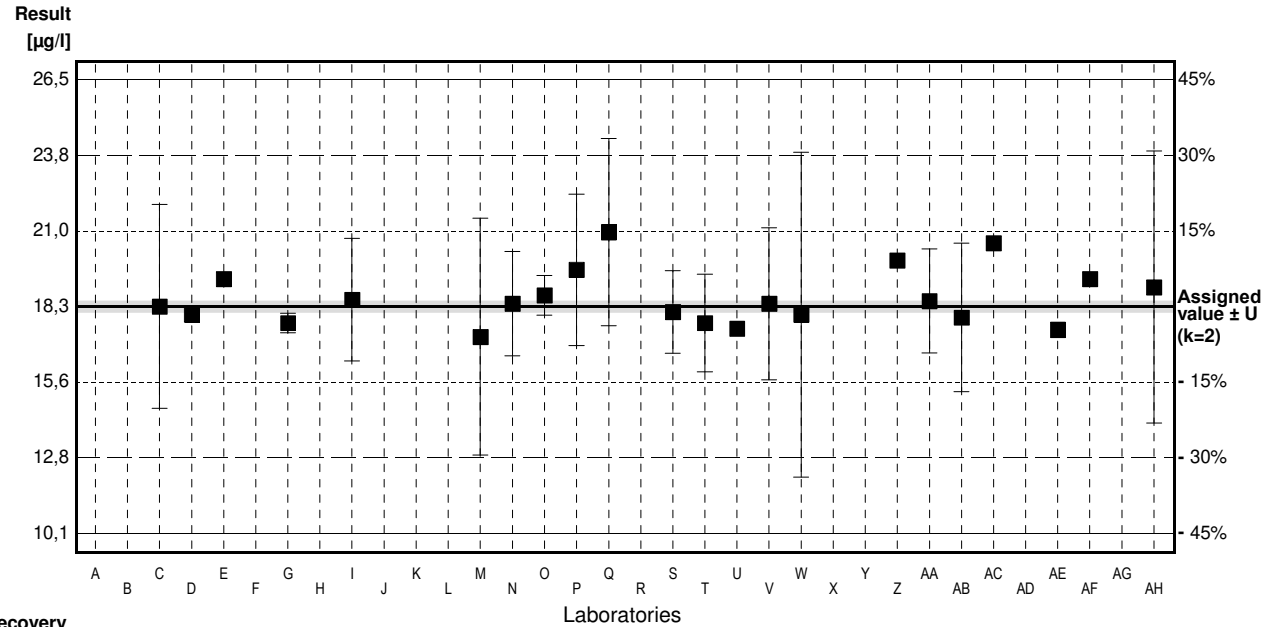
Assigned value ± U (k=2) 18,3 µg/l ± 0,2 µg/l

IFA result ± U (k=2) 18,0 µg/l ± 1,4 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<20		µg/l	*	
B			µg/l		
C	18,3	3,7	µg/l	100%	0,00
D	18,0		µg/l	98%	-0,26
E	19,3		µg/l	105%	0,85
F			µg/l		
G	17,7	0,356	µg/l	97%	-0,51
H	8,5	0,8	µg/l	46%	-8,37
I	18,548	2,226	µg/l	101%	0,21
J	<50		µg/l	*	
K			µg/l		
L			µg/l		
M	17,2	4,3	µg/l	94%	-0,94
N	18,4	1,9	µg/l	101%	0,09
O	18,7	0,72	µg/l	102%	0,34
P	19,63	2,75	µg/l	107%	1,14
Q	21,0	3,4	µg/l	115%	2,31
R			µg/l		
S	18,1	1,5	µg/l	99%	-0,17
T	17,7	1,77	µg/l	97%	-0,51
U	17,5		µg/l	96%	-0,68
V	18,4	2,76	µg/l	101%	0,09
W	18,0	5,9	µg/l	98%	-0,26
X			µg/l		
Y	66,5	8,65	µg/l	363%	41,15
Z	19,97		µg/l	109%	1,43
AA	18,497	1,887	µg/l	101%	0,17
AB	17,9	2,7	µg/l	98%	-0,34
AC	20,6		µg/l	113%	1,96
AD			µg/l		
AE	17,455		µg/l	95%	-0,72
AF	19,3		µg/l	105%	0,85
AG			µg/l		
AH	19,0	4,94	µg/l	104%	0,60

	All results	Outliers excl.	Unit
Mean ± CI(99%)	20,2 ± 5,8	18,6 ± 0,6	µg/l
Recov. ± CI(99%)	110,2 ± 31,7	101,6 ± 3,3	%
SD between labs	10,1	1,0	µg/l
RSD between labs	50,2	5,5	%
n for calculation	24	22	



# Sample M176B

## Parameter Iron

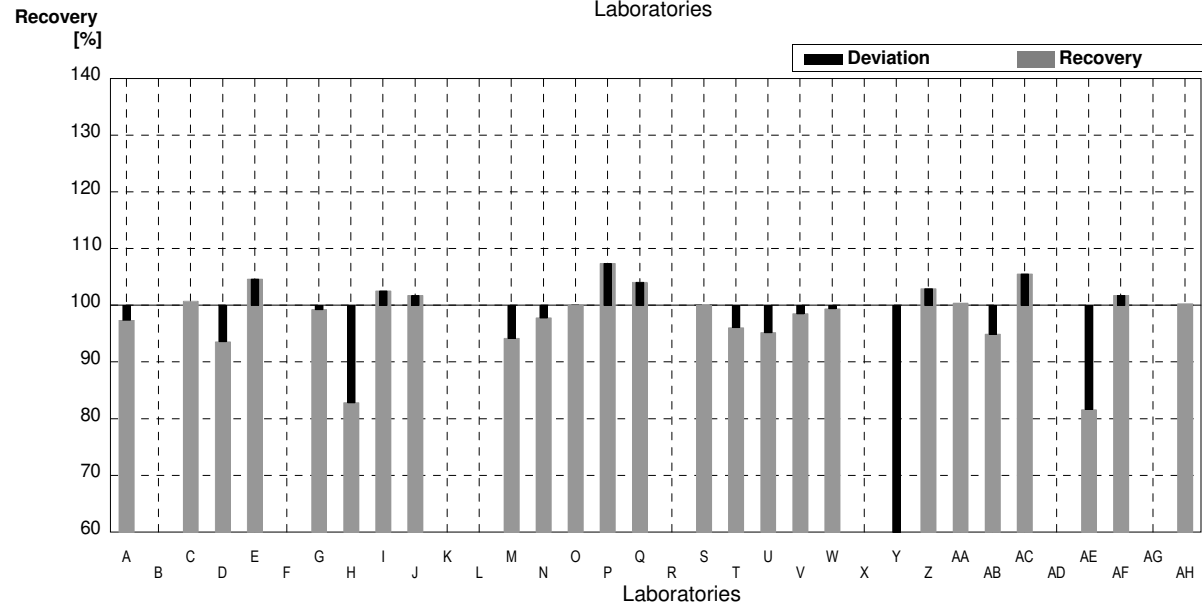
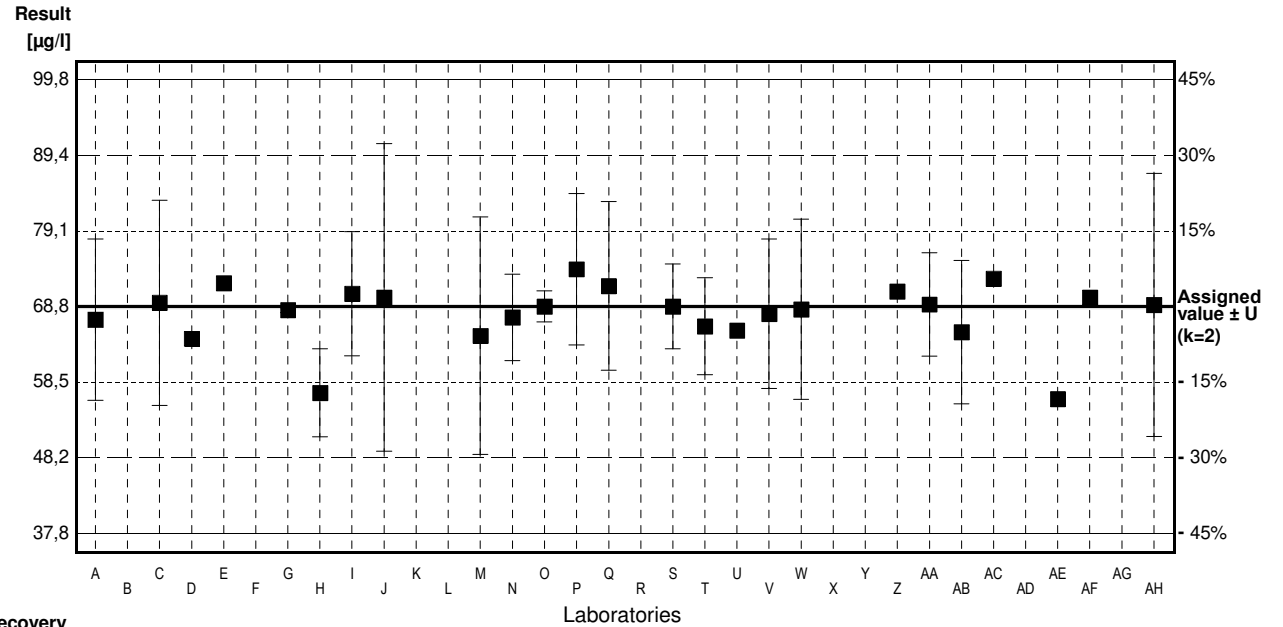
Assigned value ± U (k=2) 68,8 µg/l ± 0,3 µg/l

IFA result ± U (k=2) 67 µg/l ± 5 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	67	11	µg/l	97%	-0,41
B			µg/l		
C	69,3	14	µg/l	101%	0,11
D	64,4		µg/l	94%	-1,00
E	72,0		µg/l	105%	0,73
F			µg/l		
G	68,3	0,320	µg/l	99%	-0,11
H	57 *	6	µg/l	83%	-2,68
I	70,541	8,465	µg/l	103%	0,40
J	70,03	21,01	µg/l	102%	0,28
K			µg/l		
L			µg/l		
M	64,8	16,2	µg/l	94%	-0,91
N	67,3	5,9	µg/l	98%	-0,34
O	68,8	2,1	µg/l	100%	0,00
P	73,88	10,34	µg/l	107%	1,15
Q	71,6	11,5	µg/l	104%	0,64
R			µg/l		
S	68,8	5,8	µg/l	100%	0,00
T	66,1	6,61	µg/l	96%	-0,61
U	65,5		µg/l	95%	-0,75
V	67,8	10,2	µg/l	99%	-0,23
W	68,4	12,3	µg/l	99%	-0,09
X			µg/l		
Y	18,44 *	2,40	µg/l	27%	-11,44
Z	70,83		µg/l	103%	0,46
AA	69,073	7,045	µg/l	100%	0,06
AB	65,3	9,8	µg/l	95%	-0,79
AC	72,6		µg/l	106%	0,86
AD			µg/l		
AE	56,167 *		µg/l	82%	-2,87
AF	70		µg/l	102%	0,27
AG			µg/l		
AH	69,0	17,94	µg/l	100%	0,05

	All results	Outliers excl.	Unit
Mean ± CI(99%)	65,9 ± 5,7	68,8 ± 1,5	µg/l
Recov. ± CI(99%)	95,8 ± 8,3	99,9 ± 2,2	%
SD between labs	10,5	2,5	µg/l
RSD between labs	15,9	3,7	%
n for calculation	26	23	



# Sample M176A

## Parameter Copper

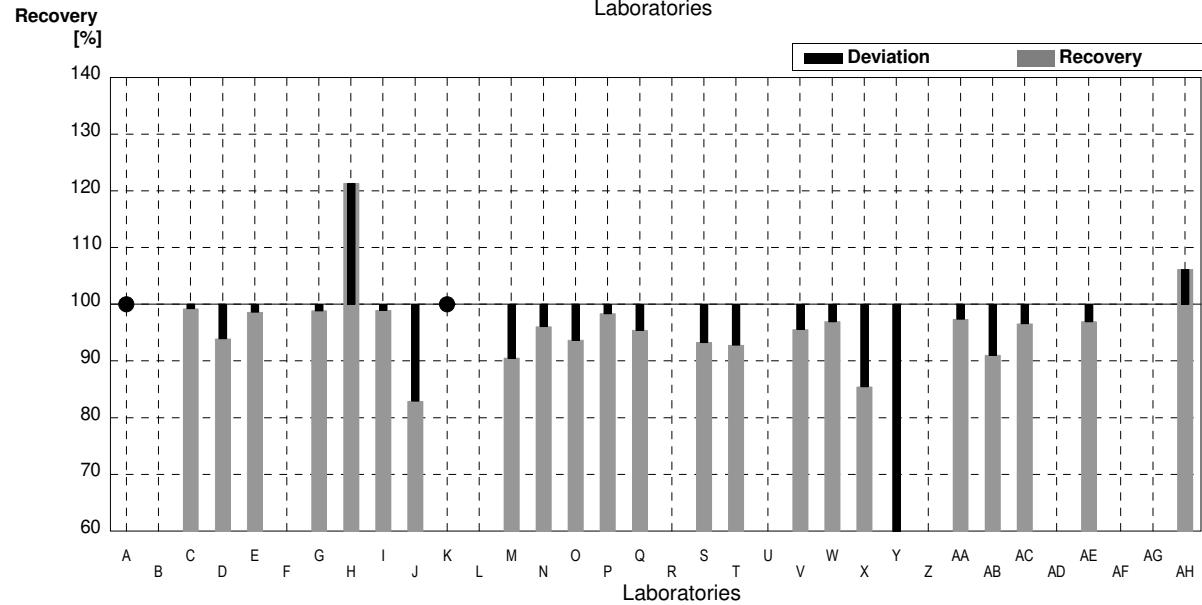
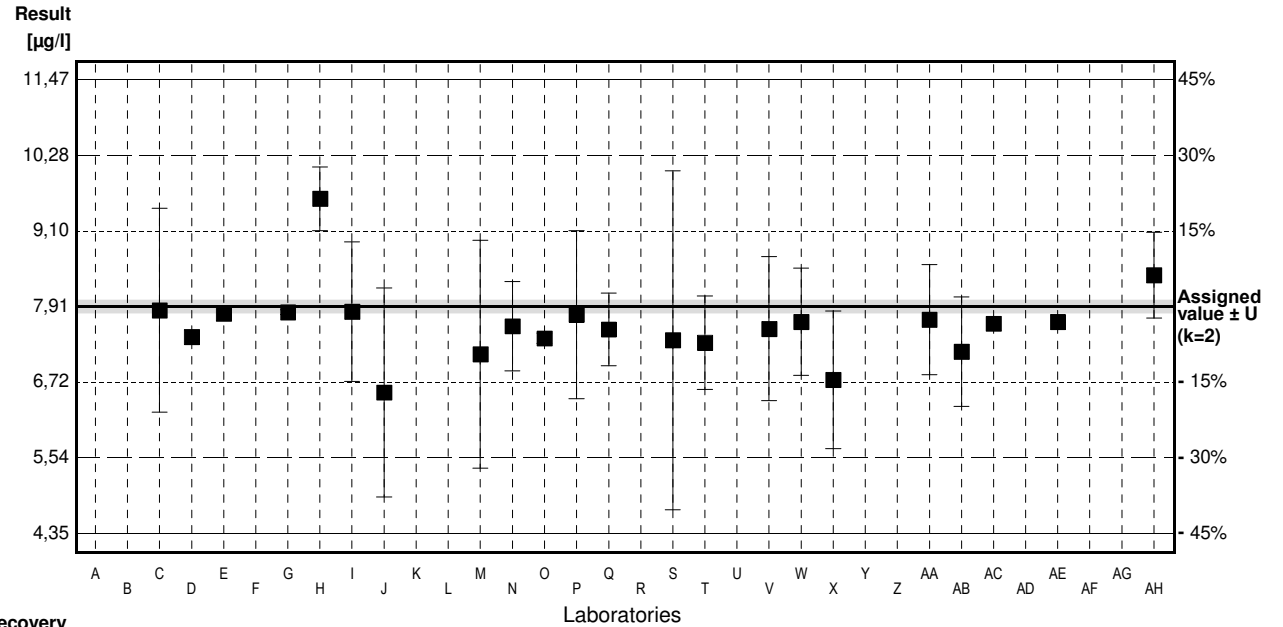
Assigned value ± U (k=2) 7,91 µg/l ± 0,10 µg/l

IFA result ± U (k=2) 7,95 µg/l ± 0,57 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<150		µg/l	*	
B			µg/l		
C	7,85	1,6	µg/l	99%	-0,10
D	7,43		µg/l	94%	-0,83
E	7,80		µg/l	99%	-0,19
F			µg/l		
G	7,82	0,0360	µg/l	99%	-0,16
H	9,6	0,5	µg/l	121%	2,93
I	7,829	1,096	µg/l	99%	-0,14
J	6,56	1,64	µg/l	83%	-2,34
K	<100		µg/l	*	
L			µg/l		
M	7,16	1,79	µg/l	91%	-1,30
N	7,6	0,7	µg/l	96%	-0,54
O	7,41	0,080	µg/l	94%	-0,87
P	7,78	1,32	µg/l	98%	-0,23
Q	7,55	0,57	µg/l	95%	-0,62
R			µg/l		
S	7,38	2,66	µg/l	93%	-0,92
T	7,34	0,734	µg/l	93%	-0,99
U			µg/l		
V	7,56	1,13	µg/l	96%	-0,61
W	7,67	0,84	µg/l	97%	-0,42
X	6,76	1,08	µg/l	85%	-1,99
Y	4,24	0,55	µg/l	54%	-6,36
Z			µg/l		
AA	7,703	0,863	µg/l	97%	-0,36
AB	7,20	0,86	µg/l	91%	-1,23
AC	7,64		µg/l	97%	-0,47
AD			µg/l		
AE	7,668		µg/l	97%	-0,42
AF			µg/l		
AG			µg/l		
AH	8,40	0,672	µg/l	106%	0,85

	All results	Outliers excl.	Unit
Mean ± CI(99%)	7,48 ± 0,53	7,58 ± 0,21	µg/l
Recov. ± CI(99%)	94,5 ± 6,8	95,8 ± 2,7	%
SD between labs	0,91	0,33	µg/l
RSD between labs	12,2	4,4	%
n for calculation	23	20	



# Sample M176B

## Parameter Copper

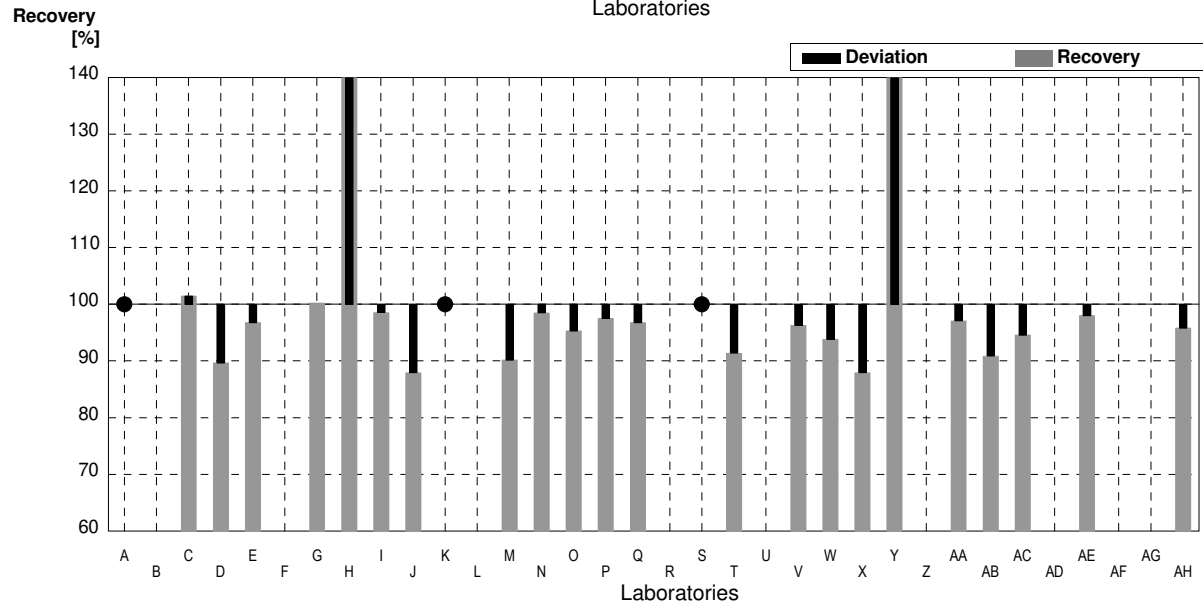
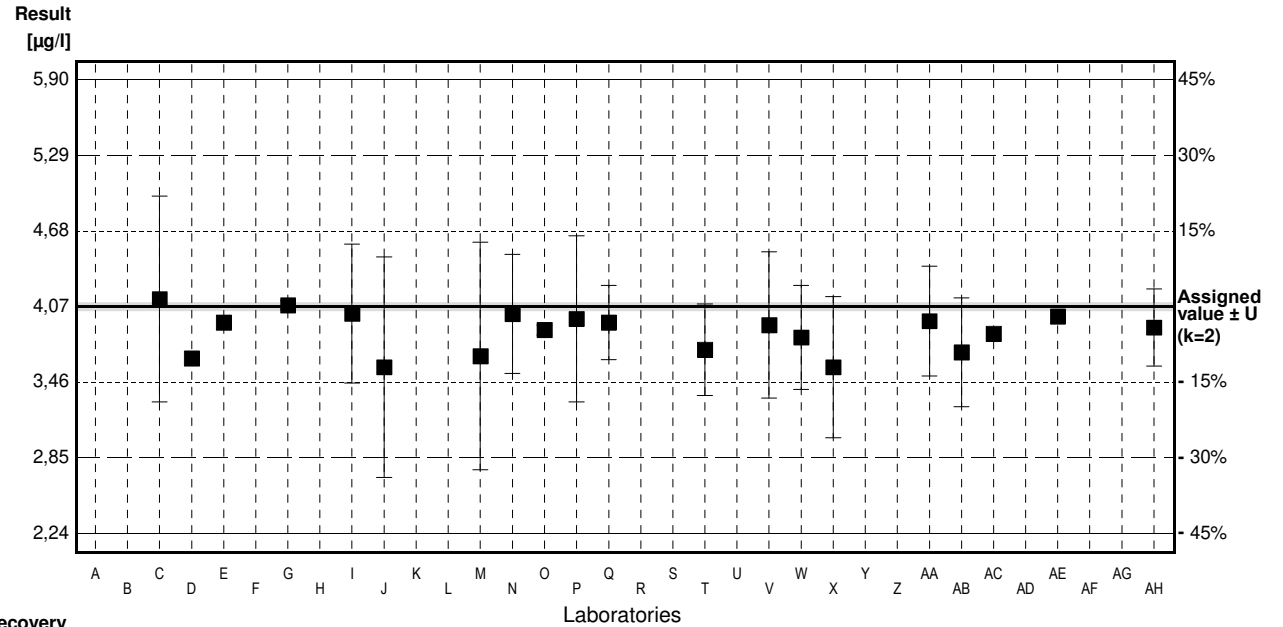
Assigned value ± U (k=2) 4,07 µg/l ± 0,03 µg/l

IFA result ± U (k=2) 4,00 µg/l ± 0,29 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<150		µg/l	*	
B			µg/l		
C	4,13	0,83	µg/l	101%	0,20
D	3,65		µg/l	90%	-1,41
E	3,94		µg/l	97%	-0,44
F			µg/l		
G	4,08	0,0344	µg/l	100%	0,03
H	7,3	0,4	µg/l	179%	10,87
I	4,012	0,562	µg/l	99%	-0,20
J	3,58	0,89	µg/l	88%	-1,65
K	<100		µg/l	*	
L			µg/l		
M	3,67	0,92	µg/l	90%	-1,35
N	4,01	0,48	µg/l	99%	-0,20
O	3,88	0,040	µg/l	95%	-0,64
P	3,97	0,67	µg/l	98%	-0,34
Q	3,94	0,30	µg/l	97%	-0,44
R			µg/l		
S	<5		µg/l	*	
T	3,72	0,37	µg/l	91%	-1,18
U			µg/l		
V	3,92	0,59	µg/l	96%	-0,50
W	3,82	0,42	µg/l	94%	-0,84
X	3,58	0,57	µg/l	88%	-1,65
Y	8,03	1,04	µg/l	197%	13,33
Z			µg/l		
AA	3,952	0,443	µg/l	97%	-0,40
AB	3,70	0,44	µg/l	91%	-1,25
AC	3,85		µg/l	95%	-0,74
AD			µg/l		
AE	3,990		µg/l	98%	-0,27
AF			µg/l		
AG			µg/l		
AH	3,90	0,312	µg/l	96%	-0,57

	All results	Outliers excl.	Unit
Mean ± CI(99%)	4,21 ± 0,68	3,86 ± 0,10	µg/l
Recov. ± CI(99%)	103,4 ± 16,8	95,0 ± 2,6	%
SD between labs	1,13	0,16	µg/l
RSD between labs	26,9	4,2	%
n for calculation	22	20	



# Sample M176A

## Parameter Manganese

Assigned value ± U (k=2) 34,31 µg/l ± 0,17 µg/l

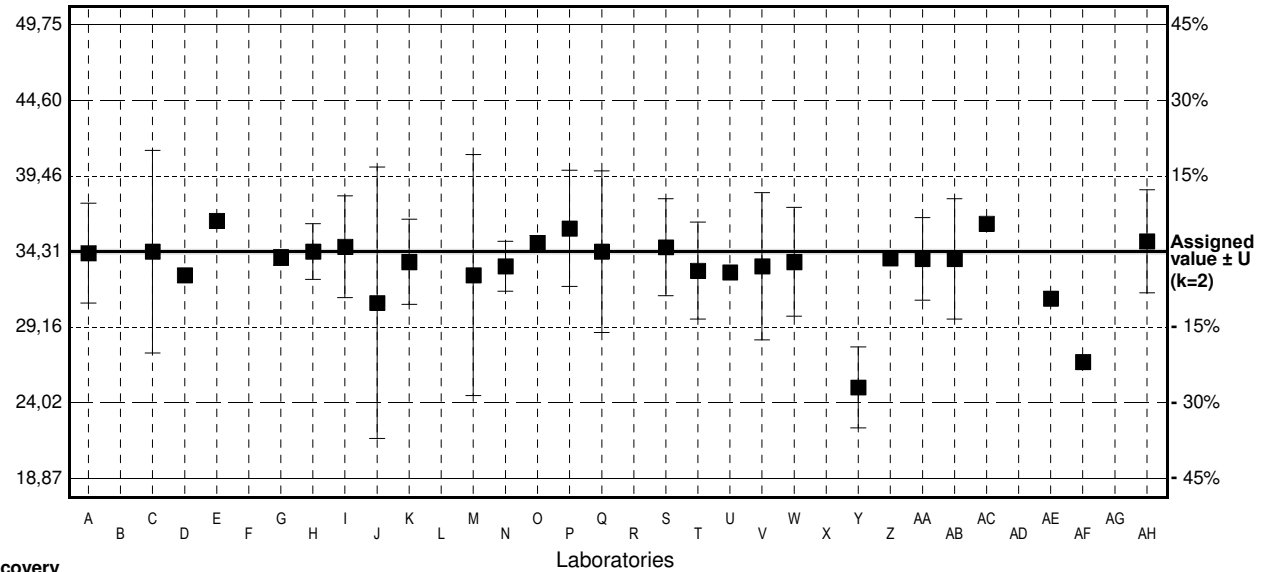
IFA result ± U (k=2) 33,6 µg/l ± 2,2 µg/l

Stability test µg/l

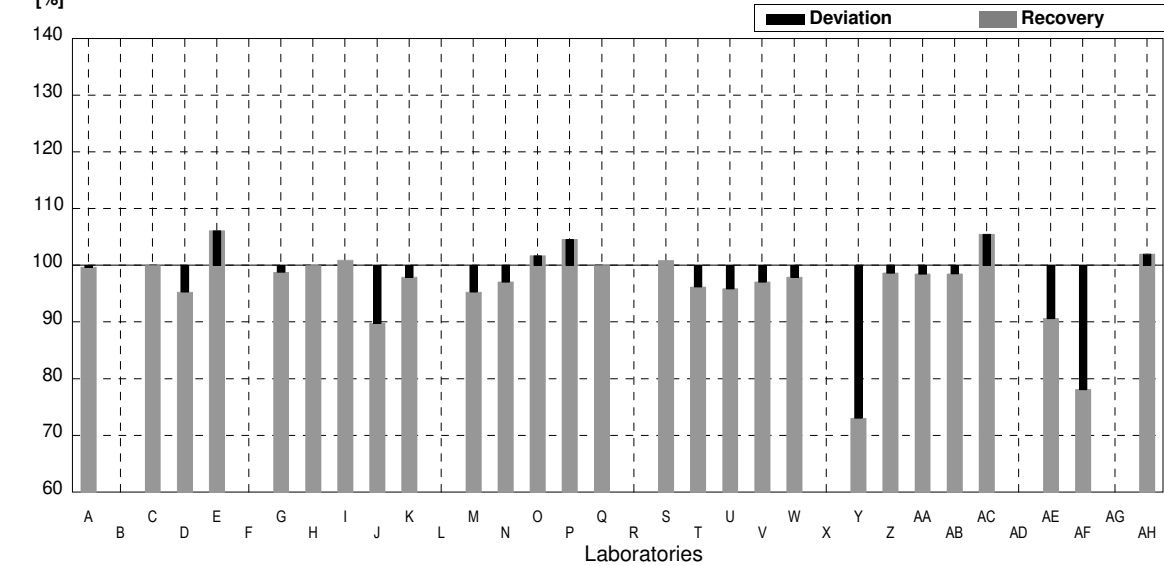
Lab Code	Result	±	Unit	Recovery	z-Score
A	34,2	3,4	µg/l	100%	-0,06
B			µg/l		
C	34,3	6,9	µg/l	100%	-0,01
D	32,7		µg/l	95%	-0,92
E	36,4		µg/l	106%	1,19
F			µg/l		
G	33,9	0,527	µg/l	99%	-0,23
H	34,3	1,9	µg/l	100%	-0,01
I	34,629	3,463	µg/l	101%	0,18
J	30,81	9,24	µg/l	90%	-2,00
K	33,6	2,9	µg/l	98%	-0,41
L			µg/l		
M	32,7	8,2	µg/l	95%	-0,92
N	33,3	1,7	µg/l	97%	-0,58
O	34,9	0,50	µg/l	102%	0,34
P	35,88	3,95	µg/l	105%	0,90
Q	34,3	5,5	µg/l	100%	-0,01
R			µg/l		
S	34,6	3,3	µg/l	101%	0,17
T	33,0	3,3	µg/l	96%	-0,75
U	32,9		µg/l	96%	-0,81
V	33,3	5,00	µg/l	97%	-0,58
W	33,6	3,7	µg/l	98%	-0,41
X			µg/l		
Y	25,06 *	2,76	µg/l	73%	-5,29
Z	33,85		µg/l	99%	-0,26
AA	33,794	2,805	µg/l	98%	-0,29
AB	33,8	4,1	µg/l	99%	-0,29
AC	36,2		µg/l	106%	1,08
AD			µg/l		
AE	31,10		µg/l	91%	-1,83
AF	26,8 *		µg/l	78%	-4,29
AG			µg/l		
AH	35,0	3,50	µg/l	102%	0,39

	All results	Outliers excl.	Unit
Mean ± CI(99%)	33,29 ± 1,33	33,88 ± 0,74	µg/l
Recov. ± CI(99%)	97,0 ± 3,9	98,8 ± 2,2	%
SD between labs	2,49	1,33	µg/l
RSD between labs	7,5	3,9	%
n for calculation	27	25	

Result [µg/l]



Recovery [%]





# Sample M176B

## Parameter Manganese

Assigned value ± U (k=2) 26,27 µg/l ± 0,15 µg/l

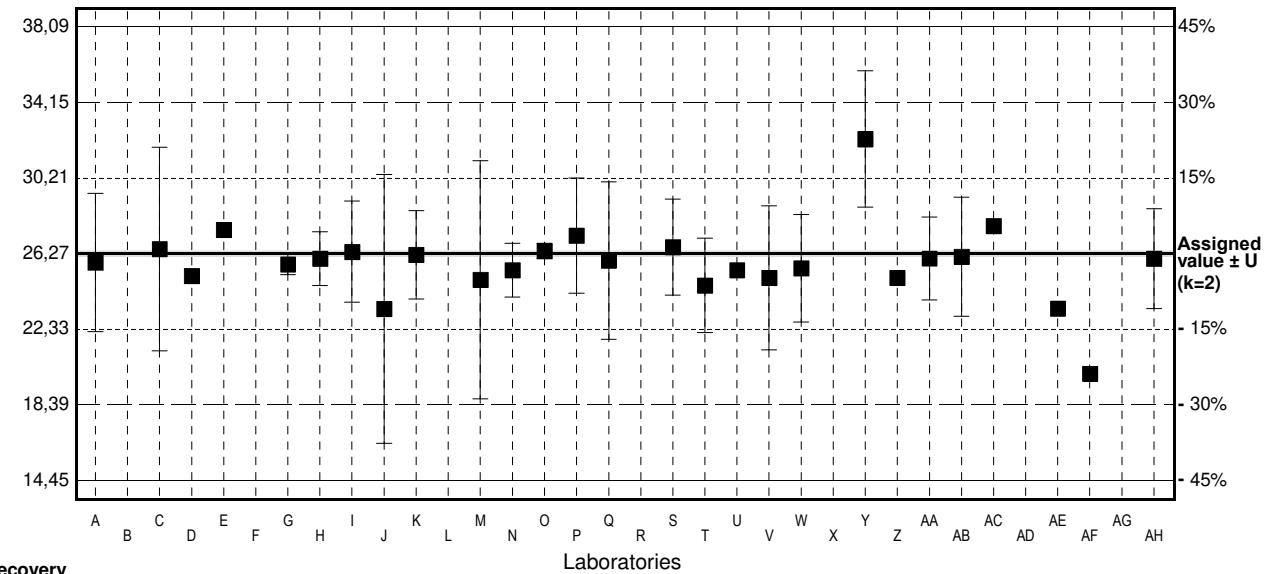
IFA result ± U (k=2) 25,3 µg/l ± 1,6 µg/l

Stability test µg/l

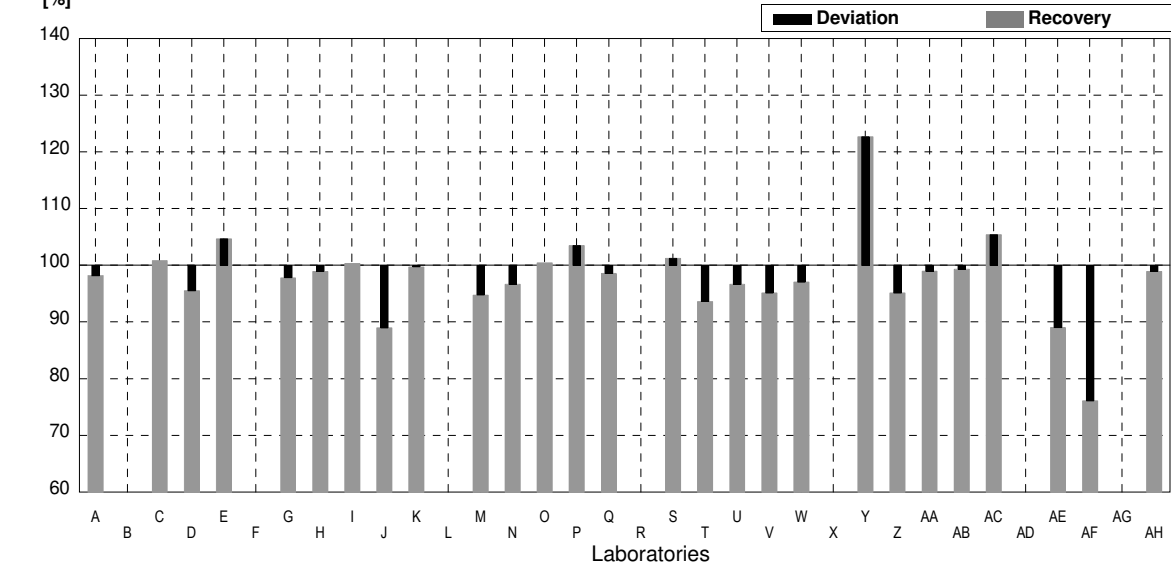
Lab Code	Result	±	Unit	Recovery	z-Score
A	25,8	3,6	µg/l	98%	-0,35
B			µg/l		
C	26,5	5,3	µg/l	101%	0,17
D	25,1		µg/l	96%	-0,87
E	27,5		µg/l	105%	0,92
F			µg/l		
G	25,7	0,547	µg/l	98%	-0,43
H	26,0	1,4	µg/l	99%	-0,20
I	26,357	2,636	µg/l	100%	0,06
J	23,38	7,01	µg/l	89%	-2,16
K	26,2	2,3	µg/l	100%	-0,05
L			µg/l		
M	24,9	6,2	µg/l	95%	-1,02
N	25,4	1,4	µg/l	97%	-0,65
O	26,4	0,40	µg/l	100%	0,10
P	27,2	3,0	µg/l	104%	0,69
Q	25,9	4,1	µg/l	99%	-0,28
R			µg/l		
S	26,6	2,5	µg/l	101%	0,25
T	24,6	2,46	µg/l	94%	-1,25
U	25,4		µg/l	97%	-0,65
V	25,0	3,75	µg/l	95%	-0,95
W	25,5	2,8	µg/l	97%	-0,57
X			µg/l		
Y	32,23 *	3,55	µg/l	123%	4,45
Z	25,00		µg/l	95%	-0,95
AA	26,006	2,158	µg/l	99%	-0,20
AB	26,1	3,1	µg/l	99%	-0,13
AC	27,7		µg/l	105%	1,07
AD			µg/l		
AE	23,40		µg/l	89%	-2,14
AF	20,0 *		µg/l	76%	-4,68
AG			µg/l		
AH	26,0	2,60	µg/l	99%	-0,20

	All results	Outliers excl.	Unit
Mean ± CI(99%)	25,77 ± 1,06	25,75 ± 0,59	µg/l
Recov. ± CI(99%)	98,1 ± 4,0	98,0 ± 2,2	%
SD between labs	1,98	1,05	µg/l
RSD between labs	7,7	4,1	%
n for calculation	27	25	

Result [µg/l]



Recovery [%]



# Sample M176A

## Parameter Nickel

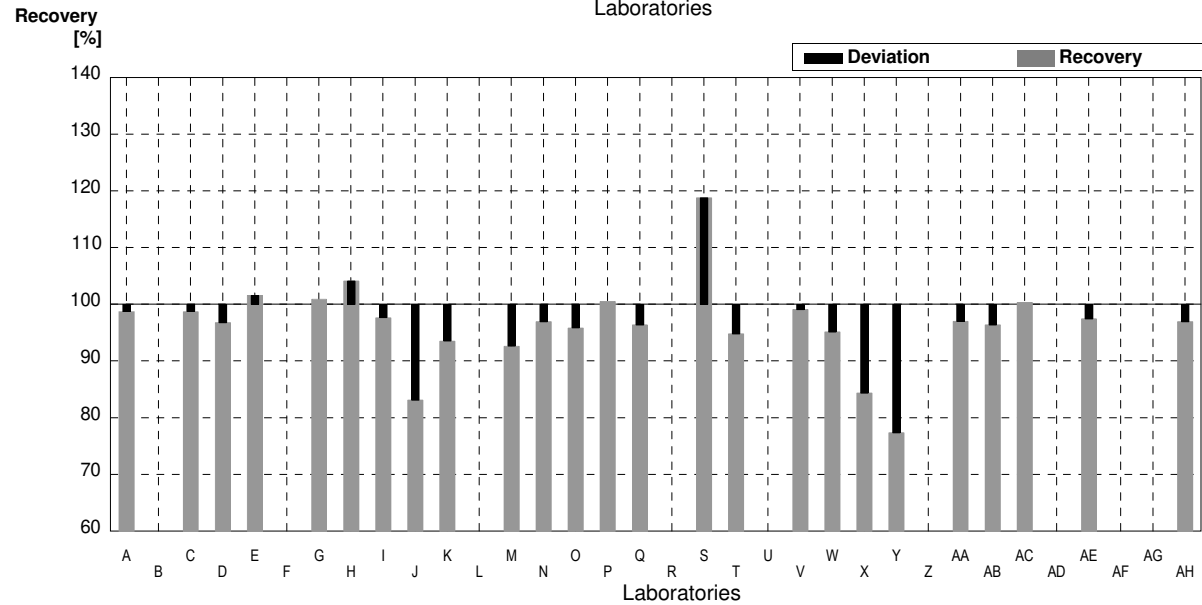
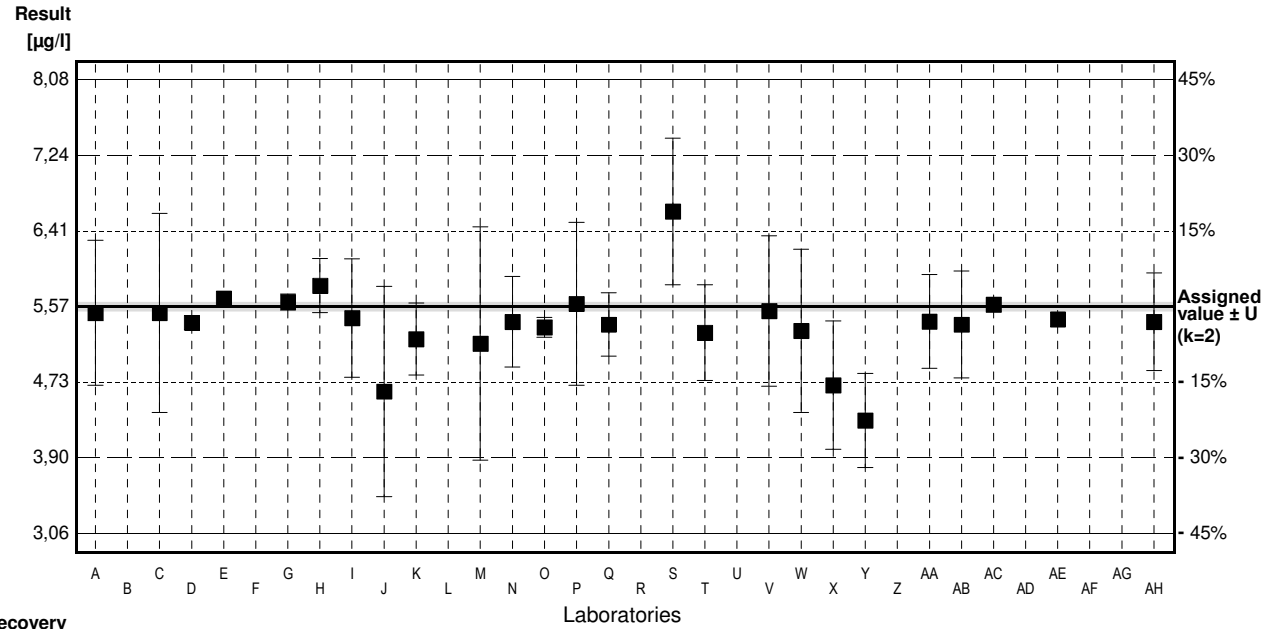
Assigned value ± U (k=2) 5,57 µg/l ± 0,05 µg/l

IFA result ± U (k=2) 5,5 µg/l ± 0,2 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	5,5	0,8	µg/l	99%	-0,20
B			µg/l		
C	5,50	1,1	µg/l	99%	-0,20
D	5,39		µg/l	97%	-0,50
E	5,66		µg/l	102%	0,25
F			µg/l		
G	5,62	0,0883	µg/l	101%	0,14
H	5,8	0,3	µg/l	104%	0,65
I	5,441	0,653	µg/l	98%	-0,36
J	4,63 *	1,16	µg/l	83%	-2,64
K	5,21	0,4	µg/l	94%	-1,01
L			µg/l		
M	5,16	1,29	µg/l	93%	-1,15
N	5,4	0,5	µg/l	97%	-0,48
O	5,34	0,11	µg/l	96%	-0,65
P	5,60	0,90	µg/l	101%	0,08
Q	5,37	0,35	µg/l	96%	-0,56
R			µg/l		
S	6,62 *	0,81	µg/l	119%	2,95
T	5,28	0,53	µg/l	95%	-0,81
U			µg/l		
V	5,52	0,83	µg/l	99%	-0,14
W	5,30	0,90	µg/l	95%	-0,76
X	4,70 *	0,71	µg/l	84%	-2,44
Y	4,31 *	0,52	µg/l	77%	-3,53
Z			µg/l		
AA	5,404	0,519	µg/l	97%	-0,47
AB	5,37	0,59	µg/l	96%	-0,56
AC	5,59		µg/l	100%	0,06
AD			µg/l		
AE	5,429		µg/l	97%	-0,40
AF			µg/l		
AG			µg/l		
AH	5,40	0,540	µg/l	97%	-0,48

	All results	Outliers excl.	Unit
Mean ± CI(99%)	5,38 ± 0,24	5,44 ± 0,10	µg/l
Recov. ± CI(99%)	96,6 ± 4,2	97,7 ± 1,7	%
SD between labs	0,42	0,15	µg/l
RSD between labs	7,8	2,8	%
n for calculation	25	21	



# Sample M176B

## Parameter Nickel

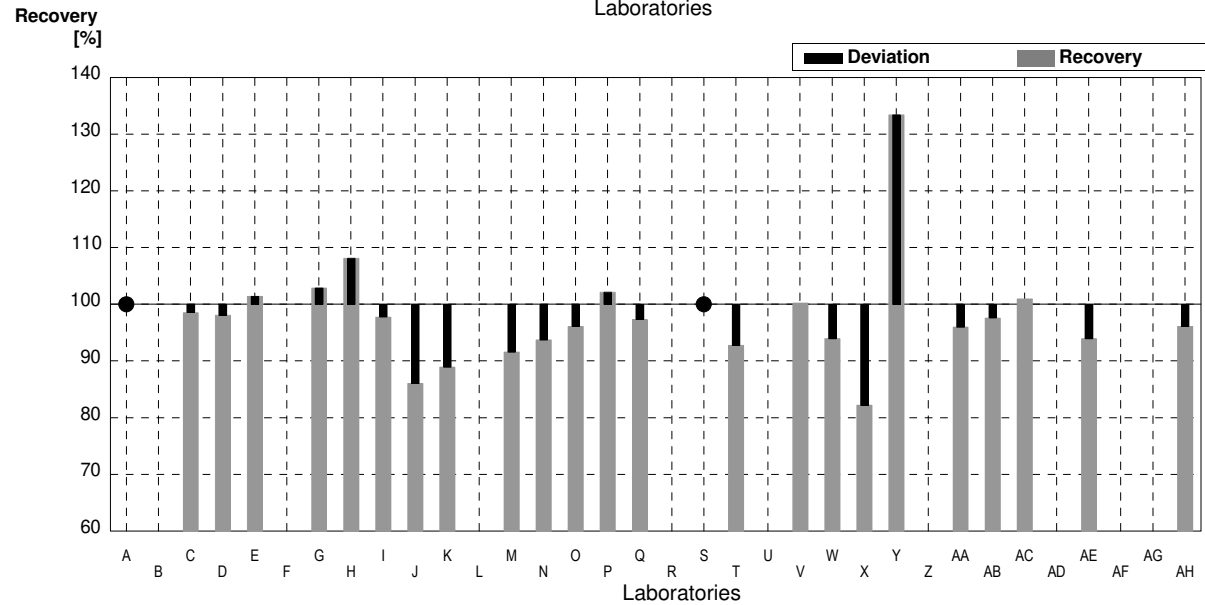
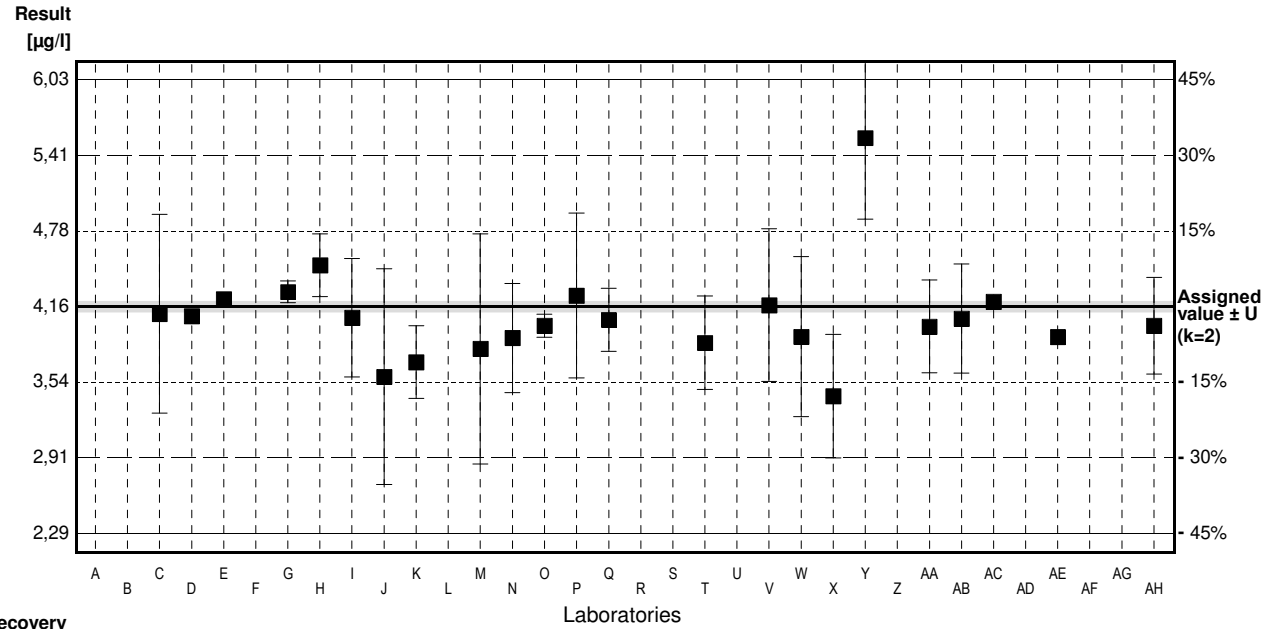
Assigned value ± U (k=2) 4,16 µg/l ± 0,04 µg/l

IFA result ± U (k=2) 4,07 µg/l ± 0,19 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5		µg/l	*	
B			µg/l		
C	4,10	0,82	µg/l	99%	-0,23
D	4,08		µg/l	98%	-0,30
E	4,22		µg/l	101%	0,23
F			µg/l		
G	4,28	0,0896	µg/l	103%	0,45
H	4,50	0,26	µg/l	108%	1,28
I	4,067	0,488	µg/l	98%	-0,35
J	3,58	0,89	µg/l	86%	-2,18
K	3,70	0,3	µg/l	89%	-1,73
L			µg/l		
M	3,81	0,95	µg/l	92%	-1,31
N	3,90	0,45	µg/l	94%	-0,98
O	4,00	0,095	µg/l	96%	-0,60
P	4,25	0,68	µg/l	102%	0,34
Q	4,05	0,26	µg/l	97%	-0,41
R			µg/l		
S	<5,0		µg/l	*	
T	3,86	0,386	µg/l	93%	-1,13
U			µg/l		
V	4,17	0,63	µg/l	100%	0,04
W	3,91	0,66	µg/l	94%	-0,94
X	3,42	0,51	µg/l	82%	-2,78
Y	5,55 *	0,67	µg/l	133%	5,22
Z			µg/l		
AA	3,994	0,383	µg/l	96%	-0,62
AB	4,06	0,45	µg/l	98%	-0,38
AC	4,20		µg/l	101%	0,15
AD			µg/l		
AE	3,909		µg/l	94%	-0,94
AF			µg/l		
AG			µg/l		
AH	4,00	0,400	µg/l	96%	-0,60

	All results	Outliers excl.	Unit
Mean ± CI(99%)	4,07 ± 0,23	4,00 ± 0,15	µg/l
Recov. ± CI(99%)	97,8 ± 5,6	96,2 ± 3,5	%
SD between labs	0,40	0,24	µg/l
RSD between labs	9,8	6,0	%
n for calculation	23	22	



# Sample M176A

## Parameter Mercury

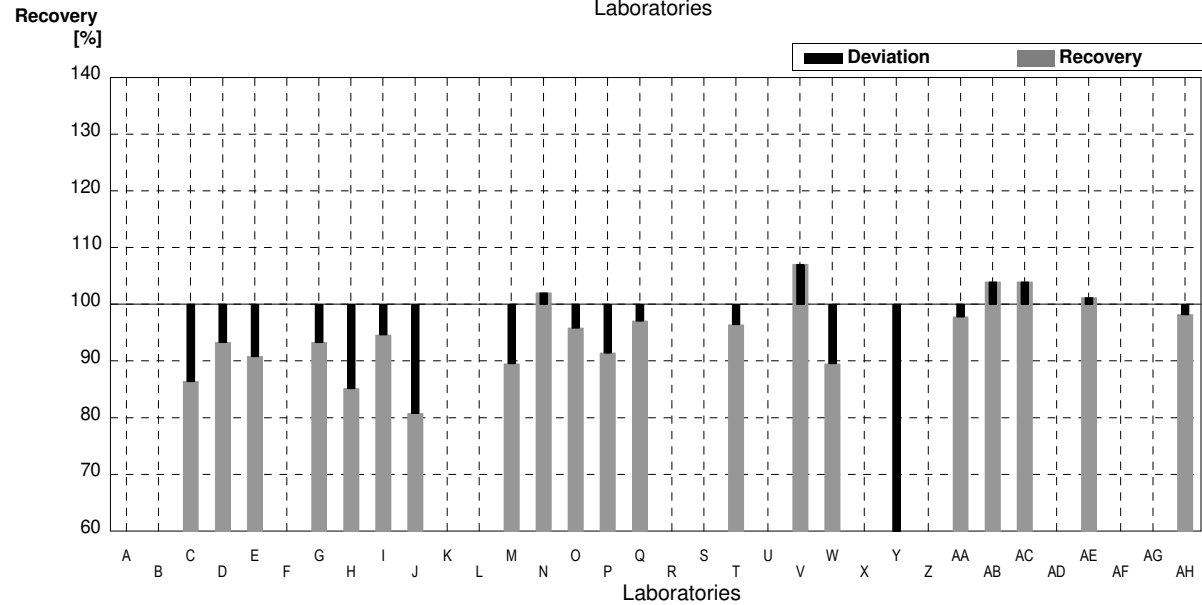
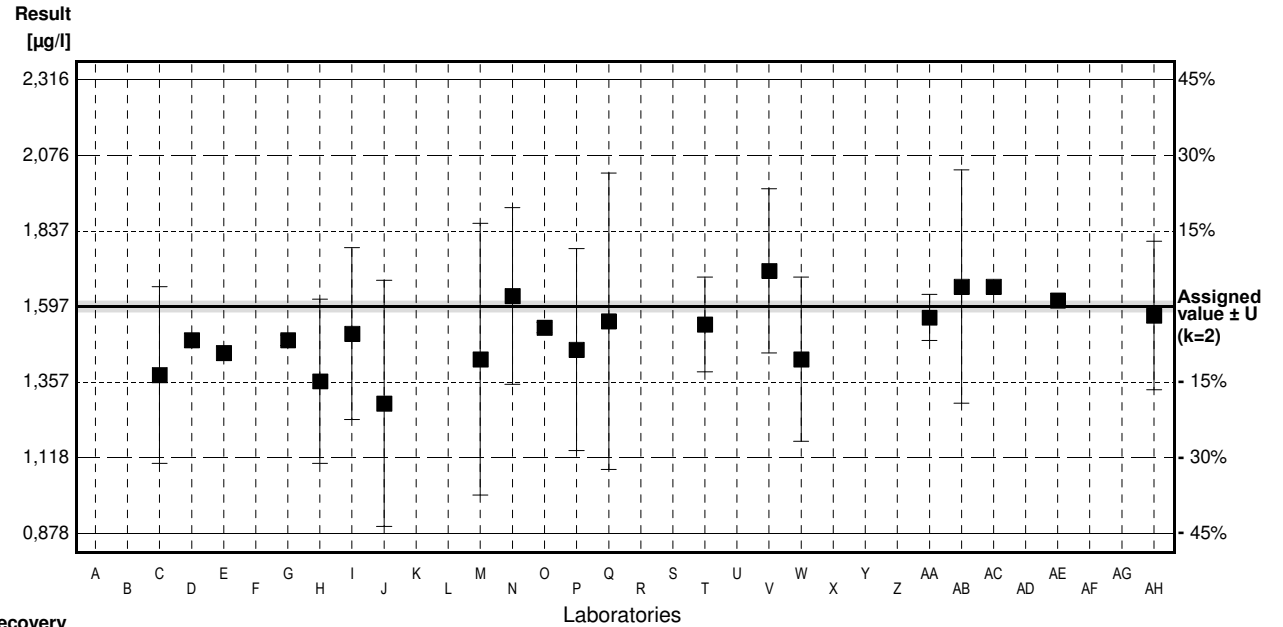
Assigned value  $\pm U$  (k=2) 1,597  $\mu\text{g/l}$   $\pm$  0,017  $\mu\text{g/l}$

IFA result  $\pm U$  (k=2) 1,54  $\mu\text{g/l}$   $\pm$  0,25  $\mu\text{g/l}$

Stability test  $\mu\text{g/l}$

Lab Code	Result	$\pm$	Unit	Recovery	z-Score
A			$\mu\text{g/l}$		
B			$\mu\text{g/l}$		
C	1,38	0,28	$\mu\text{g/l}$	86%	-1,24
D	1,49		$\mu\text{g/l}$	93%	-0,61
E	1,45		$\mu\text{g/l}$	91%	-0,84
F			$\mu\text{g/l}$		
G	1,49	0,017	$\mu\text{g/l}$	93%	-0,61
H	1,36	0,26	$\mu\text{g/l}$	85%	-1,35
I	1,511	0,272	$\mu\text{g/l}$	95%	-0,49
J	1,29	0,39	$\mu\text{g/l}$	81%	-1,75
K			$\mu\text{g/l}$		
L			$\mu\text{g/l}$		
M	1,43	0,43	$\mu\text{g/l}$	90%	-0,95
N	1,63	0,28	$\mu\text{g/l}$	102%	0,19
O	1,53	0,017	$\mu\text{g/l}$	96%	-0,38
P	1,46	0,32	$\mu\text{g/l}$	91%	-0,78
Q	1,55	0,47	$\mu\text{g/l}$	97%	-0,27
R			$\mu\text{g/l}$		
S			$\mu\text{g/l}$		
T	1,54	0,15	$\mu\text{g/l}$	96%	-0,32
U			$\mu\text{g/l}$		
V	1,71	0,26	$\mu\text{g/l}$	107%	0,64
W	1,43	0,26	$\mu\text{g/l}$	90%	-0,95
X			$\mu\text{g/l}$		
Y	0,78	*	0,172	49%	-4,65
Z			$\mu\text{g/l}$		
AA	1,562	0,073	$\mu\text{g/l}$	98%	-0,20
AB	1,66	0,37	$\mu\text{g/l}$	104%	0,36
AC	1,66		$\mu\text{g/l}$	104%	0,36
AD			$\mu\text{g/l}$		
AE	1,616		$\mu\text{g/l}$	101%	0,11
AF			$\mu\text{g/l}$		
AG			$\mu\text{g/l}$		
AH	1,568	0,2352	$\mu\text{g/l}$	98%	-0,17

	All results	Outliers excl.	Unit
Mean $\pm$ CI(99%)	1,481 $\pm$ 0,120	1,516 $\pm$ 0,070	$\mu\text{g/l}$
Recov. $\pm$ CI(99%)	92,7 $\pm$ 7,5	94,9 $\pm$ 4,4	%
SD between labs	0,193	0,109	$\mu\text{g/l}$
RSD between labs	13,0	7,2	%
n for calculation	21	20	



# Sample M176B

## Parameter Mercury

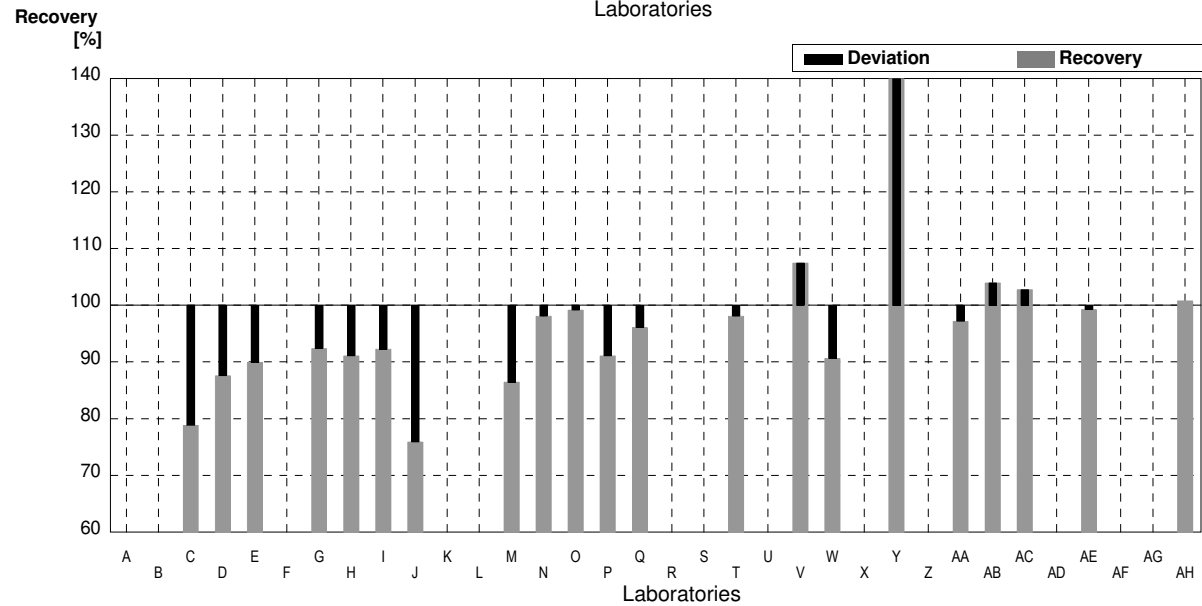
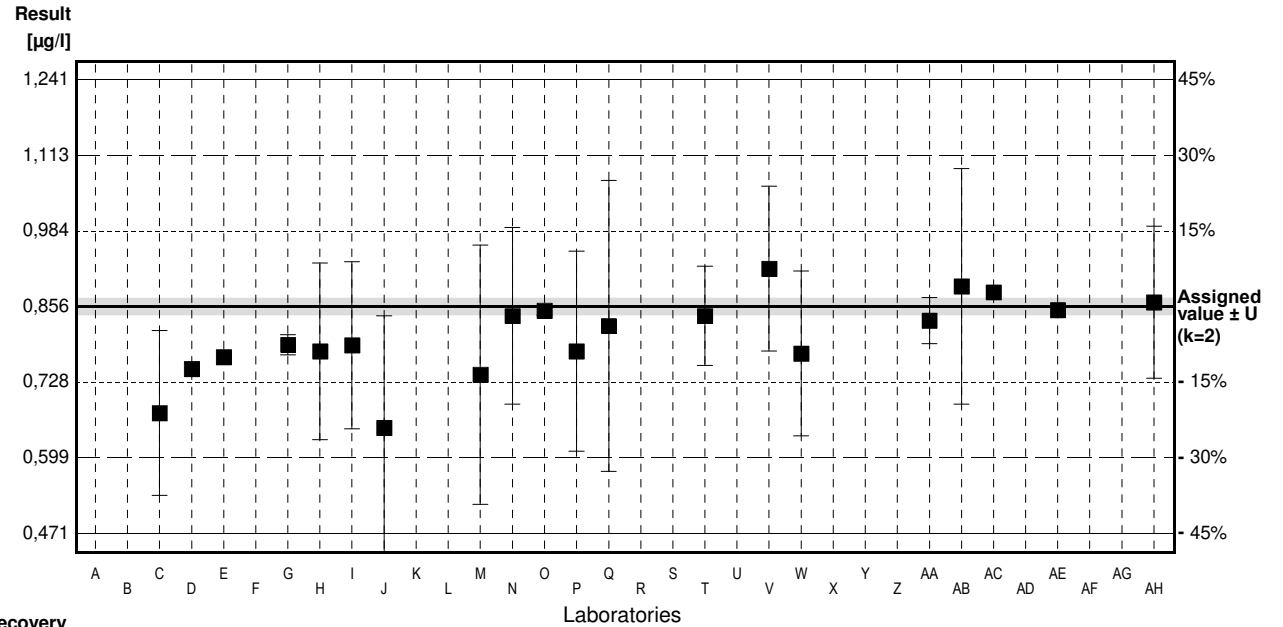
Assigned value ± U (k=2) 0,856 µg/l ± 0,014 µg/l

IFA result ± U (k=2) 0,72 µg/l ± 0,12 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B			µg/l		
C	0,675	0,14	µg/l	79%	-1,92
D	0,75		µg/l	88%	-1,13
E	0,77		µg/l	90%	-0,91
F			µg/l		
G	0,791	0,017	µg/l	92%	-0,69
H	0,78	0,15	µg/l	91%	-0,81
I	0,790	0,142	µg/l	92%	-0,70
J	0,65	0,19	µg/l	76%	-2,19
K			µg/l		
L			µg/l		
M	0,74	0,22	µg/l	86%	-1,23
N	0,84	0,15	µg/l	98%	-0,17
O	0,849	0,008	µg/l	99%	-0,07
P	0,78	0,17	µg/l	91%	-0,81
Q	0,823	0,247	µg/l	96%	-0,35
R			µg/l		
S			µg/l		
T	0,84	0,084	µg/l	98%	-0,17
U			µg/l		
V	0,92	0,14	µg/l	107%	0,68
W	0,776	0,140	µg/l	91%	-0,85
X			µg/l		
Y	1,46 *	0,32	µg/l	171%	6,41
Z			µg/l		
AA	0,832	0,039	µg/l	97%	-0,25
AB	0,890	0,20	µg/l	104%	0,36
AC	0,88		µg/l	103%	0,25
AD			µg/l		
AE	0,850		µg/l	99%	-0,06
AF			µg/l		
AG			µg/l		
AH	0,863	0,129	µg/l	101%	0,07

	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,836 ± 0,098	0,804 ± 0,044	µg/l
Recov. ± CI(99%)	97,6 ± 11,5	94,0 ± 5,1	%
SD between labs	0,158	0,068	µg/l
RSD between labs	18,9	8,5	%
n for calculation	21	20	



# Sample M176A

## Parameter Selenium

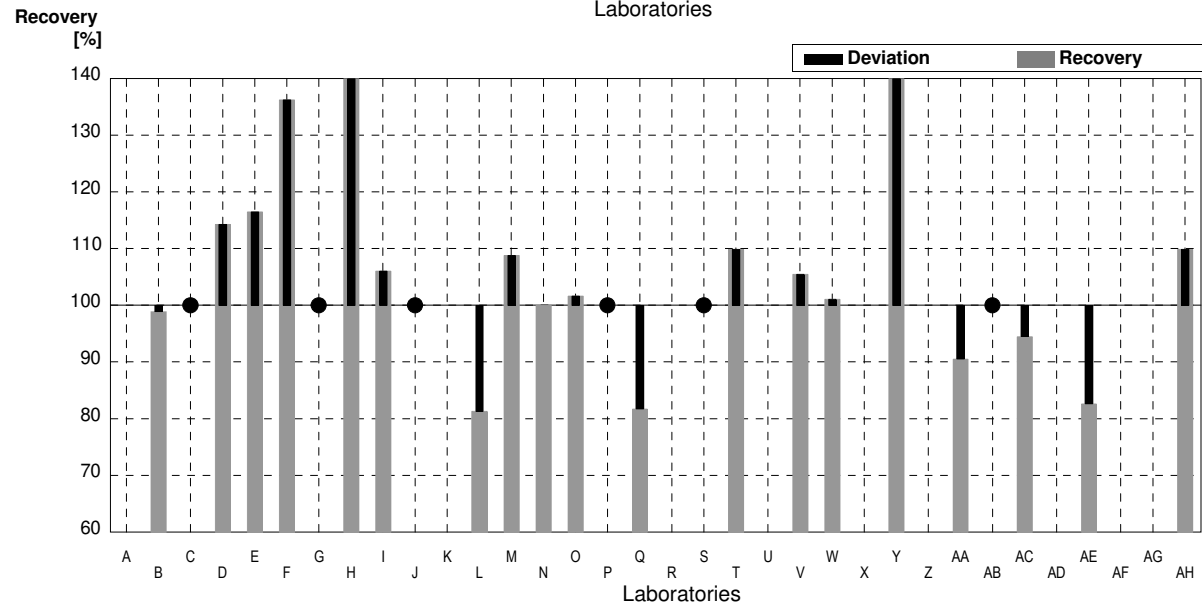
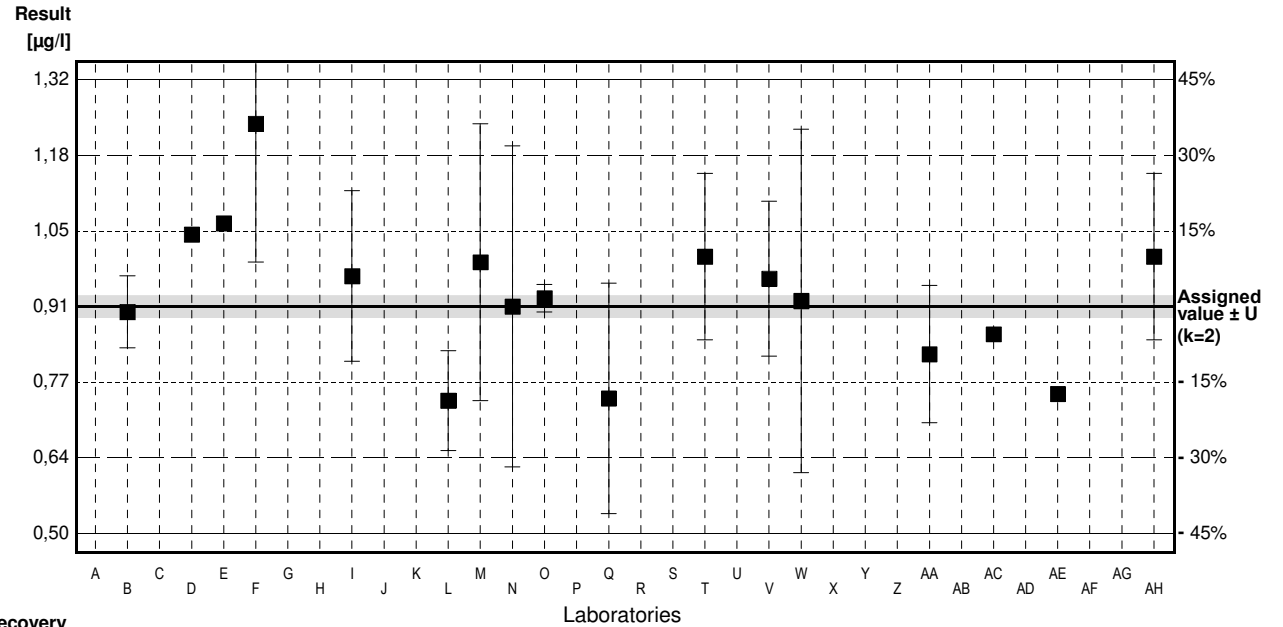
Assigned value ± U (k=2) 0,91 µg/l ± 0,02 µg/l

IFA result ± U (k=2) 1,04 µg/l ± 0,14 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B	0,90	0,065	µg/l	99%	-0,13
C	<1		µg/l	*	
D	1,04		µg/l	114%	1,68
E	1,06		µg/l	116%	1,94
F	1,24	0,25	µg/l	136%	4,27
G	<1,00		µg/l	*	
H	1,58 *	0,07	µg/l	174%	8,66
I	0,965	0,154	µg/l	106%	0,71
J	<2		µg/l	*	
K			µg/l		
L	0,74	0,09	µg/l	81%	-2,20
M	0,99	0,25	µg/l	109%	1,03
N	0,91	0,29	µg/l	100%	0,00
O	0,925	0,025	µg/l	102%	0,19
P	<2,0		µg/l	*	
Q	0,744	0,208	µg/l	82%	-2,15
R			µg/l		
S	<10		µg/l	*	
T	1,00	0,15	µg/l	110%	1,16
U			µg/l		
V	0,96	0,14	µg/l	105%	0,65
W	0,92	0,31	µg/l	101%	0,13
X			µg/l		
Y	1,59 *	0,19	µg/l	175%	8,79
Z			µg/l		
AA	0,824	0,124	µg/l	91%	-1,11
AB	<1,0		µg/l	*	
AC	0,86		µg/l	95%	-0,65
AD			µg/l		
AE	0,752		µg/l	83%	-2,04
AF			µg/l		
AG			µg/l		
AH	1,00	0,150	µg/l	110%	1,16

	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,00 ± 0,16	0,93 ± 0,09	µg/l
Recov. ± CI(99%)	109,9 ± 17,3	102,3 ± 9,9	%
SD between labs	0,24	0,13	µg/l
RSD between labs	23,9	13,7	%
n for calculation	19	17	



# Sample M176B

## Parameter Selenium

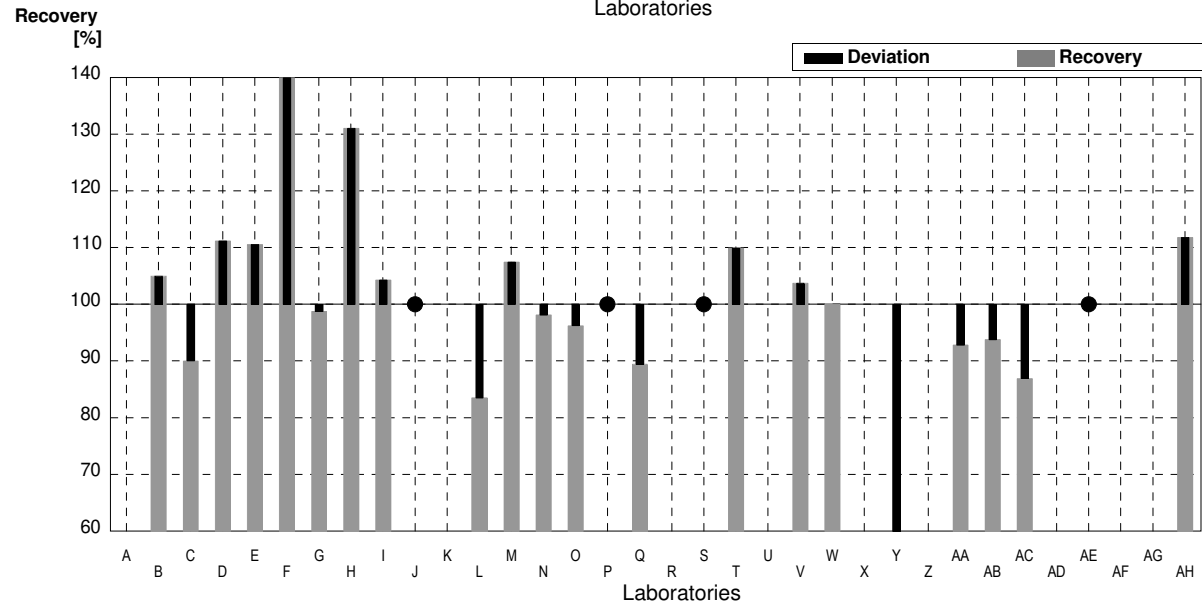
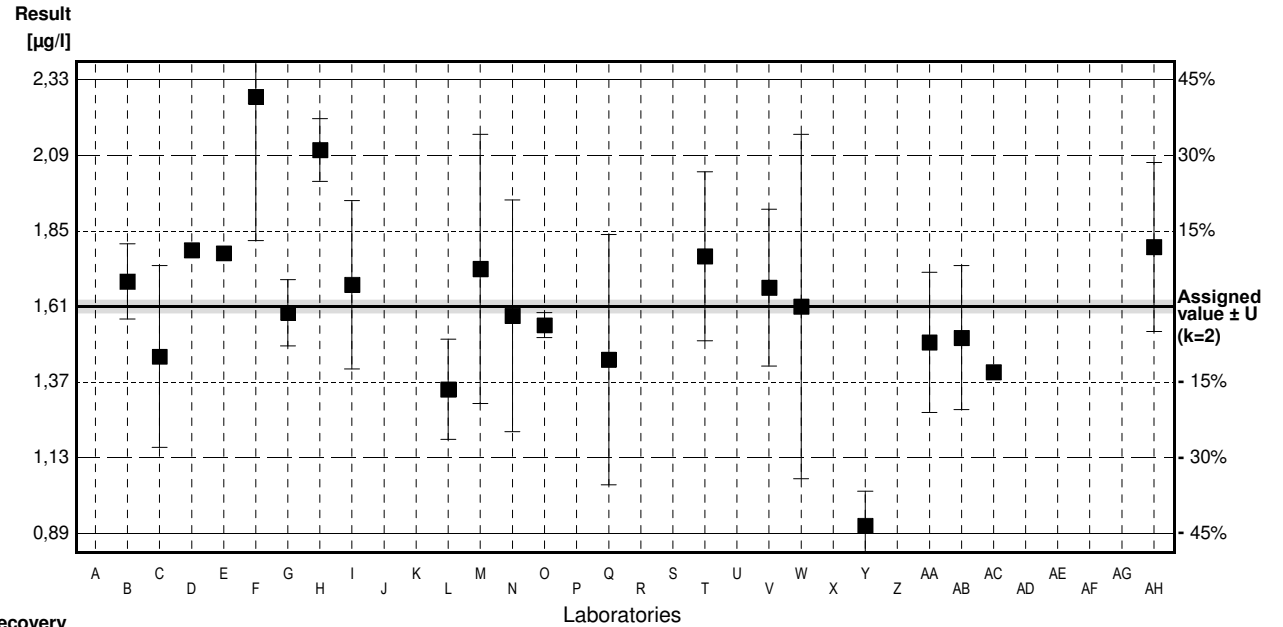
Assigned value ± U (k=2) 1,61 µg/l ± 0,02 µg/l

IFA result ± U (k=2) 1,82 µg/l ± 0,24 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B	1,69	0,12	µg/l	105%	0,58
C	1,45	0,29	µg/l	90%	-1,17
D	1,79		µg/l	111%	1,32
E	1,78		µg/l	111%	1,24
F	2,28	0,46	µg/l	142%	4,90
G	1,59	0,106	µg/l	99%	-0,15
H	2,11	0,10	µg/l	131%	3,65
I	1,679	0,269	µg/l	104%	0,50
J	<2		µg/l	•	
K			µg/l		
L	1,345	0,16	µg/l	84%	-1,94
M	1,73	0,43	µg/l	107%	0,88
N	1,58	0,37	µg/l	98%	-0,22
O	1,55	0,040	µg/l	96%	-0,44
P	<5,0		µg/l	•	
Q	1,44	0,40	µg/l	89%	-1,24
R			µg/l		
S	<10		µg/l	•	
T	1,77	0,27	µg/l	110%	1,17
U			µg/l		
V	1,67	0,25	µg/l	104%	0,44
W	1,61	0,55	µg/l	100%	0,00
X			µg/l		
Y	0,91	0,11	µg/l	57%	-5,12
Z			µg/l		
AA	1,495	0,224	µg/l	93%	-0,84
AB	1,51	0,23	µg/l	94%	-0,73
AC	1,40		µg/l	87%	-1,53
AD			µg/l		
AE	<10		µg/l	•	
AF			µg/l		
AG			µg/l		
AH	1,80	0,270	µg/l	112%	1,39

	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,63 ± 0,17	1,63 ± 0,17	µg/l
Recov. ± CI(99%)	101,1 ± 10,7	101,1 ± 10,7	%
SD between labs	0,28	0,28	µg/l
RSD between labs	17,0	17,0	%
n for calculation	21	21	



# Sample M176A

## Parameter Uranium

Assigned value  $\pm U$  (k=2) 0,499  $\mu\text{g/l}$   $\pm$  0,006  $\mu\text{g/l}$

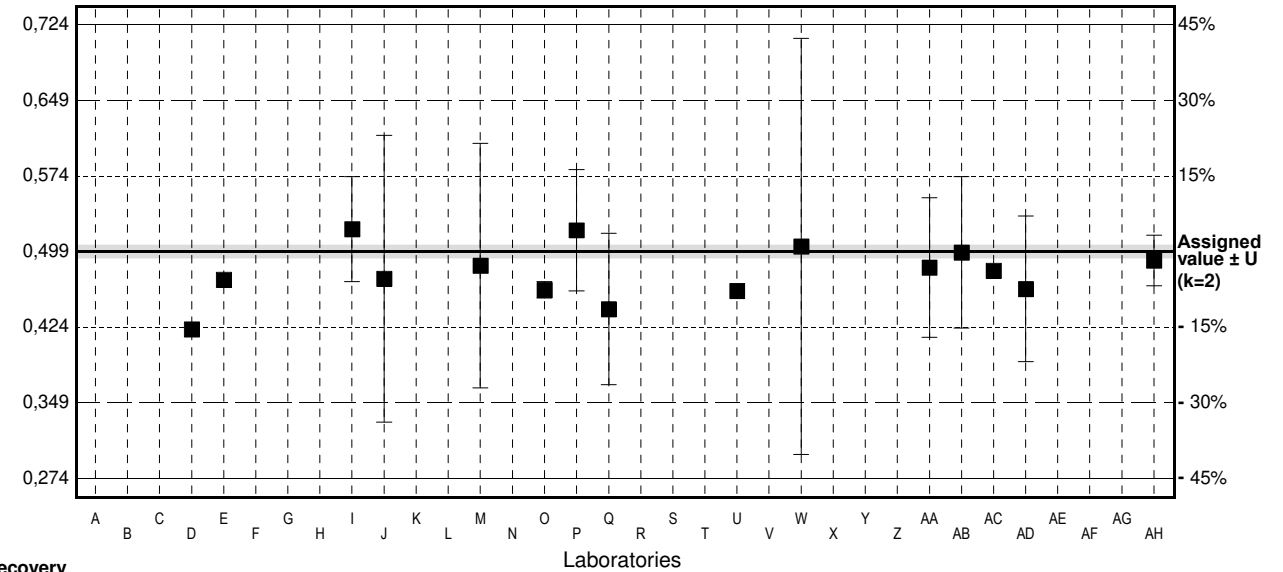
IFA result  $\pm U$  (k=2) 0,470  $\mu\text{g/l}$   $\pm$  0,046  $\mu\text{g/l}$

Stability test  $\mu\text{g/l}$

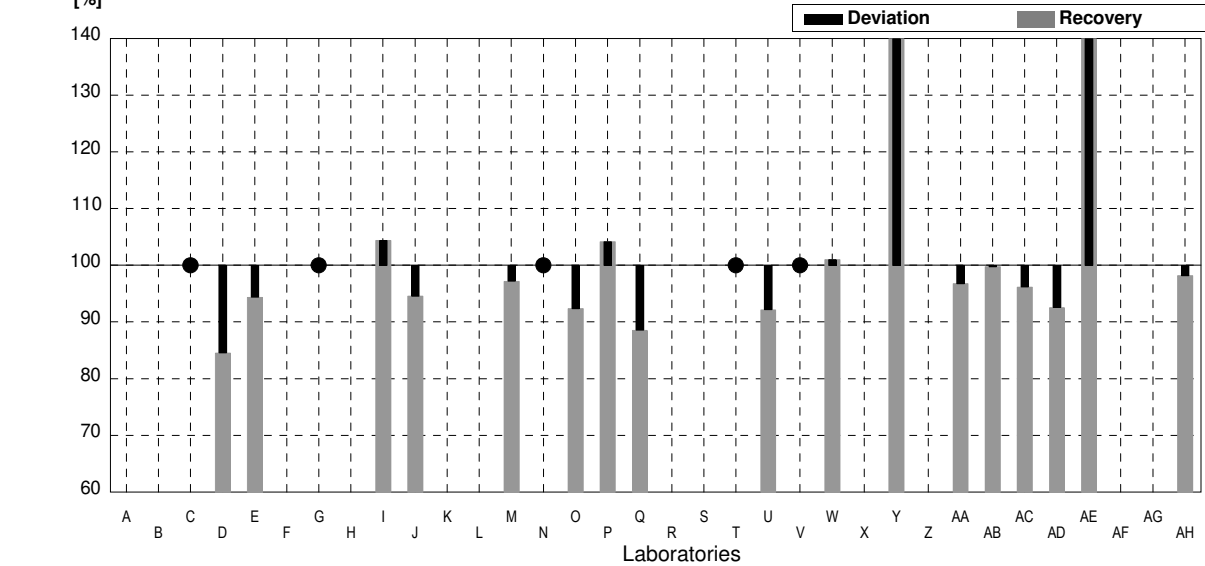
Lab Code	Result	$\pm$	Unit	Recovery	z-Score
A			$\mu\text{g/l}$		
B			$\mu\text{g/l}$		
C	<1		$\mu\text{g/l}$	•	
D	0,422		$\mu\text{g/l}$	85%	-2,86
E	0,471		$\mu\text{g/l}$	94%	-1,04
F			$\mu\text{g/l}$		
G	<1,00		$\mu\text{g/l}$	•	
H			$\mu\text{g/l}$		
I	0,521	0,052	$\mu\text{g/l}$	104%	0,82
J	0,472	0,142	$\mu\text{g/l}$	95%	-1,00
K			$\mu\text{g/l}$		
L			$\mu\text{g/l}$		
M	0,485	0,121	$\mu\text{g/l}$	97%	-0,52
N	<1		$\mu\text{g/l}$	•	
O	0,461	0,008	$\mu\text{g/l}$	92%	-1,41
P	0,52	0,06	$\mu\text{g/l}$	104%	0,78
Q	0,442	0,075	$\mu\text{g/l}$	89%	-2,12
R			$\mu\text{g/l}$		
S			$\mu\text{g/l}$		
T	<1		$\mu\text{g/l}$	•	
U	0,460		$\mu\text{g/l}$	92%	-1,45
V	<1		$\mu\text{g/l}$	•	
W	0,504	0,206	$\mu\text{g/l}$	101%	0,19
X			$\mu\text{g/l}$		
Y	1,55	*	0,26	311%	39,00
Z			$\mu\text{g/l}$		
AA	0,483	0,069	$\mu\text{g/l}$	97%	-0,59
AB	0,498	0,075	$\mu\text{g/l}$	100%	-0,04
AC	0,480		$\mu\text{g/l}$	96%	-0,71
AD	0,462	0,072	$\mu\text{g/l}$	93%	-1,37
AE	3,400	*	$\mu\text{g/l}$	681%	107,66
AF			$\mu\text{g/l}$		
AG			$\mu\text{g/l}$		
AH	0,490	0,025	$\mu\text{g/l}$	98%	-0,33

	All results	Outliers excl.	Unit
Mean $\pm$ CI(99%)	0,713 $\pm$ 0,524	0,478 $\pm$ 0,021	$\mu\text{g/l}$
Recov. $\pm$ CI(99%)	142,9 $\pm$ 105,0	95,8 $\pm$ 4,2	%
SD between labs	0,740	0,027	$\mu\text{g/l}$
RSD between labs	103,8	5,7	%
n for calculation	17	15	

Result  
[ $\mu\text{g/l}$ ]



Recovery  
[%]





# Sample M176B

## Parameter Uranium

Assigned value ± U (k=2) 1,713 µg/l ± 0,015 µg/l

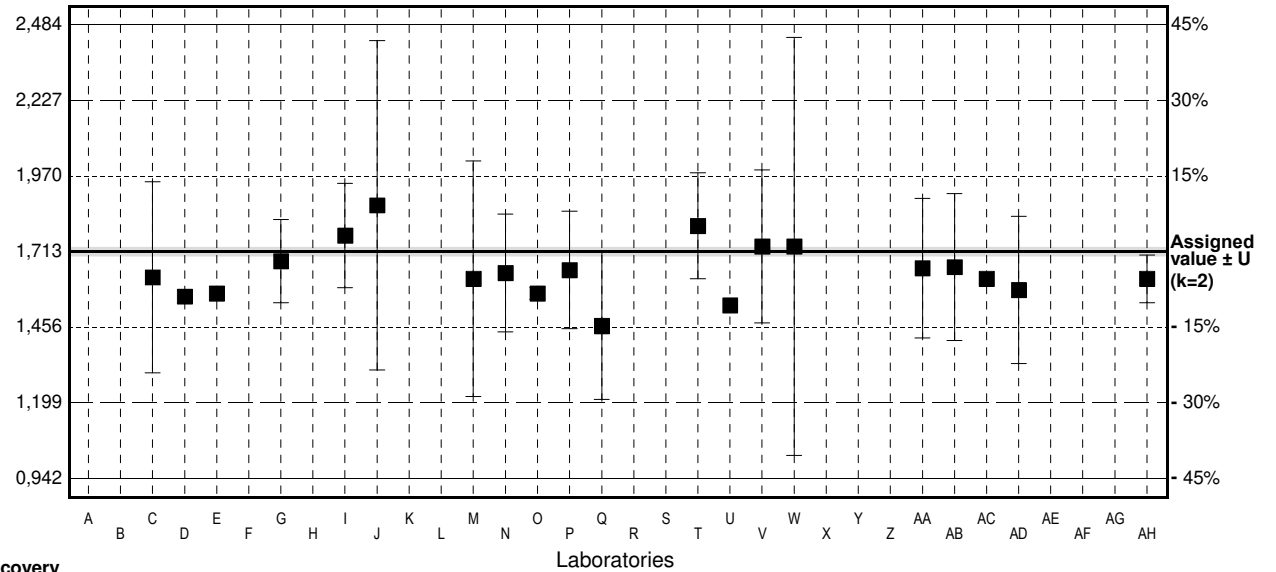
IFA result ± U (k=2) 1,52 µg/l ± 0,15 µg/l

Stability test µg/l

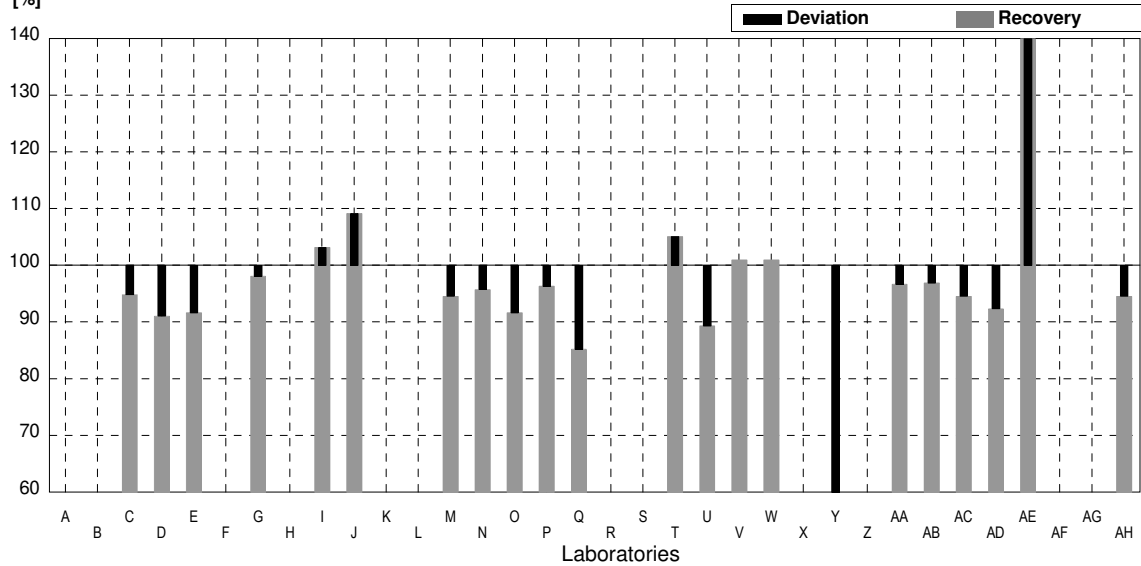
Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B			µg/l		
C	1,625	0,325	µg/l	95%	-0,95
D	1,56		µg/l	91%	-1,65
E	1,57		µg/l	92%	-1,55
F			µg/l		
G	1,68	0,141	µg/l	98%	-0,36
H			µg/l		
I	1,767	0,177	µg/l	103%	0,58
J	1,87	0,56	µg/l	109%	1,70
K			µg/l		
L			µg/l		
M	1,62	0,40	µg/l	95%	-1,01
N	1,64	0,20	µg/l	96%	-0,79
O	1,57	0,021	µg/l	92%	-1,55
P	1,65	0,20	µg/l	96%	-0,68
Q	1,46	0,25	µg/l	85%	-2,74
R			µg/l		
S			µg/l		
T	1,80	0,18	µg/l	105%	0,94
U	1,53		µg/l	89%	-1,98
V	1,73	0,26	µg/l	101%	0,18
W	1,73	0,71	µg/l	101%	0,18
X			µg/l		
Y	0,470 *	0,08	µg/l	27%	-13,44
Z			µg/l		
AA	1,656	0,237	µg/l	97%	-0,62
AB	1,66	0,25	µg/l	97%	-0,57
AC	1,62		µg/l	95%	-1,01
AD	1,582	0,250	µg/l	92%	-1,42
AE	4,515 *		µg/l	264%	30,29
AF			µg/l		
AG			µg/l		
AH	1,62	0,081	µg/l	95%	-1,01

	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,724 ± 0,409	1,647 ± 0,062	µg/l
Recov. ± CI(99%)	100,6 ± 23,9	96,1 ± 3,6	%
SD between labs	0,678	0,097	µg/l
RSD between labs	39,3	5,9	%
n for calculation	22	20	

Result [µg/l]



Recovery [%]



# Sample M176A

## Parameter Zinc

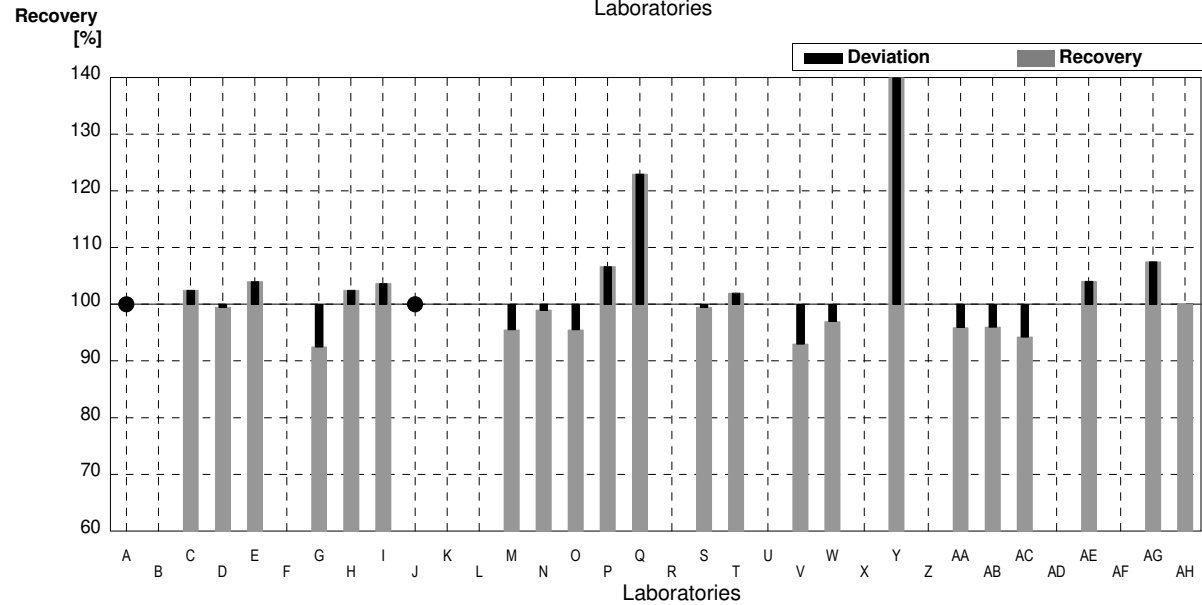
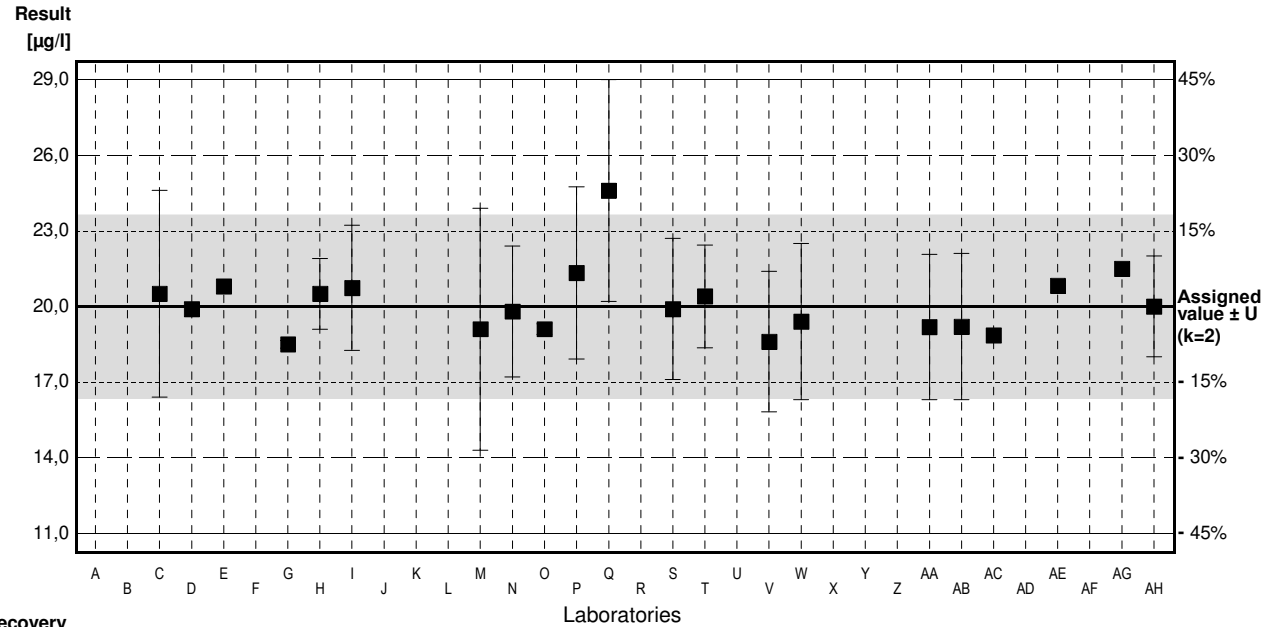
Assigned value ± U (k=2) 20,0 µg/l ± 3,6 µg/l

IFA result ± U (k=2) 24,6 µg/l ± 3,6 µg/l

Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<500		µg/l	*	
B			µg/l		
C	20,5	4,1	µg/l	103%	0,38
D	19,9		µg/l	100%	-0,08
E	20,8		µg/l	104%	0,62
F			µg/l		
G	18,5	0,153	µg/l	93%	-1,15
H	20,5	1,4	µg/l	103%	0,38
I	20,739	2,489	µg/l	104%	0,57
J	<30		µg/l	*	
K			µg/l		
L			µg/l		
M	19,1	4,8	µg/l	96%	-0,69
N	19,8	2,6	µg/l	99%	-0,15
O	19,1	0,21	µg/l	96%	-0,69
P	21,33	3,41	µg/l	107%	1,02
Q	24,6 *	4,4	µg/l	123%	3,54
R			µg/l		
S	19,9	2,8	µg/l	100%	-0,08
T	20,4	2,04	µg/l	102%	0,31
U			µg/l		
V	18,6	2,79	µg/l	93%	-1,08
W	19,4	3,1	µg/l	97%	-0,46
X			µg/l		
Y	85,74 *	14,58	µg/l	429%	50,57
Z			µg/l		
AA	19,183	2,877	µg/l	96%	-0,63
AB	19,2	2,9	µg/l	96%	-0,62
AC	18,85		µg/l	94%	-0,88
AD			µg/l		
AE	20,82		µg/l	104%	0,63
AF			µg/l		
AG	21,5		µg/l	108%	1,15
AH	20,0	2,00	µg/l	100%	0,00

	All results	Outliers excl.	Unit
Mean ± CI(99%)	23,1 ± 8,5	19,9 ± 0,6	µg/l
Recov. ± CI(99%)	115,6 ± 42,4	99,5 ± 2,9	%
SD between labs	14,0	0,9	µg/l
RSD between labs	60,8	4,5	%
n for calculation	22	20	



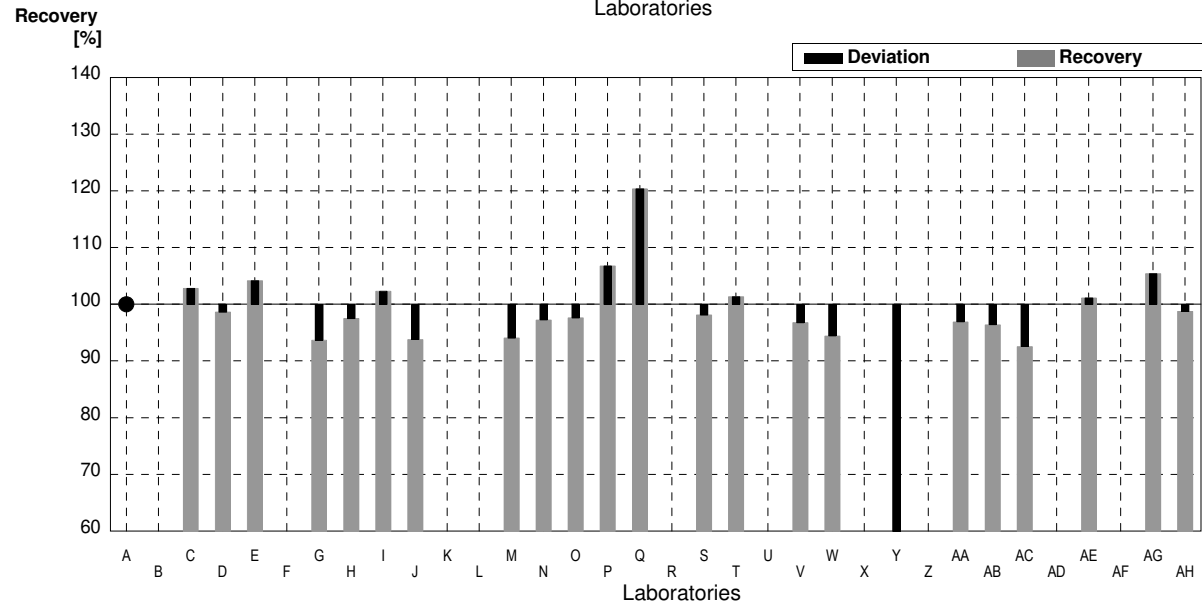
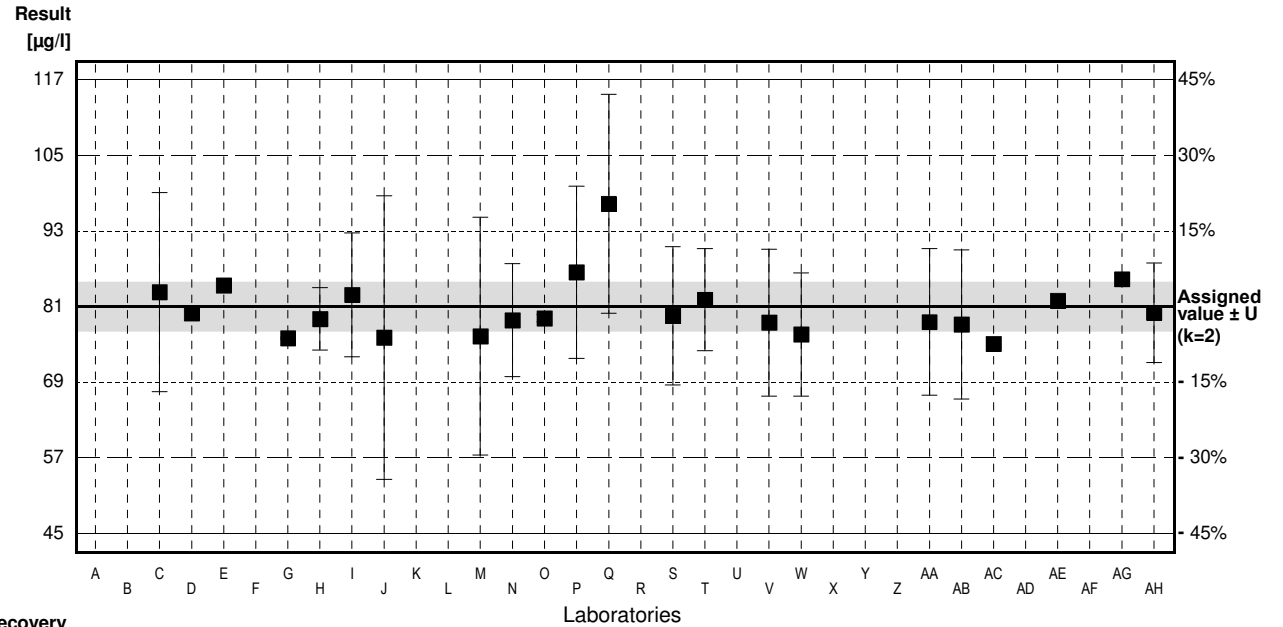
# Sample M176B

## Parameter Zinc

Assigned value  $\pm U$  (k=2) 81  $\mu\text{g/l}$   $\pm$  4  $\mu\text{g/l}$   
 IFA result  $\pm U$  (k=2) 77  $\mu\text{g/l}$   $\pm$  9  $\mu\text{g/l}$   
 Stability test  $\mu\text{g/l}$

Lab Code	Result	$\pm$	Unit	Recovery	z-Score
A	<500		$\mu\text{g/l}$	*	
B			$\mu\text{g/l}$		
C	83,3	16	$\mu\text{g/l}$	103%	0,44
D	79,9		$\mu\text{g/l}$	99%	-0,21
E	84,4		$\mu\text{g/l}$	104%	0,65
F			$\mu\text{g/l}$		
G	75,9	0,149	$\mu\text{g/l}$	94%	-0,97
H	79	5	$\mu\text{g/l}$	98%	-0,38
I	82,865	9,944	$\mu\text{g/l}$	102%	0,35
J	75,99	22,80	$\mu\text{g/l}$	94%	-0,95
K			$\mu\text{g/l}$		
L			$\mu\text{g/l}$		
M	76,2	19,1	$\mu\text{g/l}$	94%	-0,91
N	78,8	9,1	$\mu\text{g/l}$	97%	-0,42
O	79,1	0,59	$\mu\text{g/l}$	98%	-0,36
P	86,50	13,84	$\mu\text{g/l}$	107%	1,04
Q	97,5 *	17,6	$\mu\text{g/l}$	120%	3,13
R			$\mu\text{g/l}$		
S	79,5	11,1	$\mu\text{g/l}$	98%	-0,28
T	82,1	8,21	$\mu\text{g/l}$	101%	0,21
U			$\mu\text{g/l}$		
V	78,4	11,8	$\mu\text{g/l}$	97%	-0,49
W	76,5	9,9	$\mu\text{g/l}$	94%	-0,85
X			$\mu\text{g/l}$		
Y	21,34 *	3,63	$\mu\text{g/l}$	26%	-11,33
Z			$\mu\text{g/l}$		
AA	78,498	11,775	$\mu\text{g/l}$	97%	-0,48
AB	78,1	12	$\mu\text{g/l}$	96%	-0,55
AC	75,0		$\mu\text{g/l}$	93%	-1,14
AD			$\mu\text{g/l}$		
AE	81,92		$\mu\text{g/l}$	101%	0,17
AF			$\mu\text{g/l}$		
AG	85,4		$\mu\text{g/l}$	105%	0,84
AH	80,0	8,00	$\mu\text{g/l}$	99%	-0,19

	All results	Outliers excl.	Unit
Mean $\pm$ CI(99%)	78 $\pm$ 8	80 $\pm$ 2	$\mu\text{g/l}$
Recov. $\pm$ CI(99%)	96,4 $\pm$ 9,6	98,6 $\pm$ 2,5	%
SD between labs	13	3	$\mu\text{g/l}$
RSD between labs	17,0	4,1	%
n for calculation	23	21	







**Labororientierte Auswertung**  
**Laboratory Oriented Part**

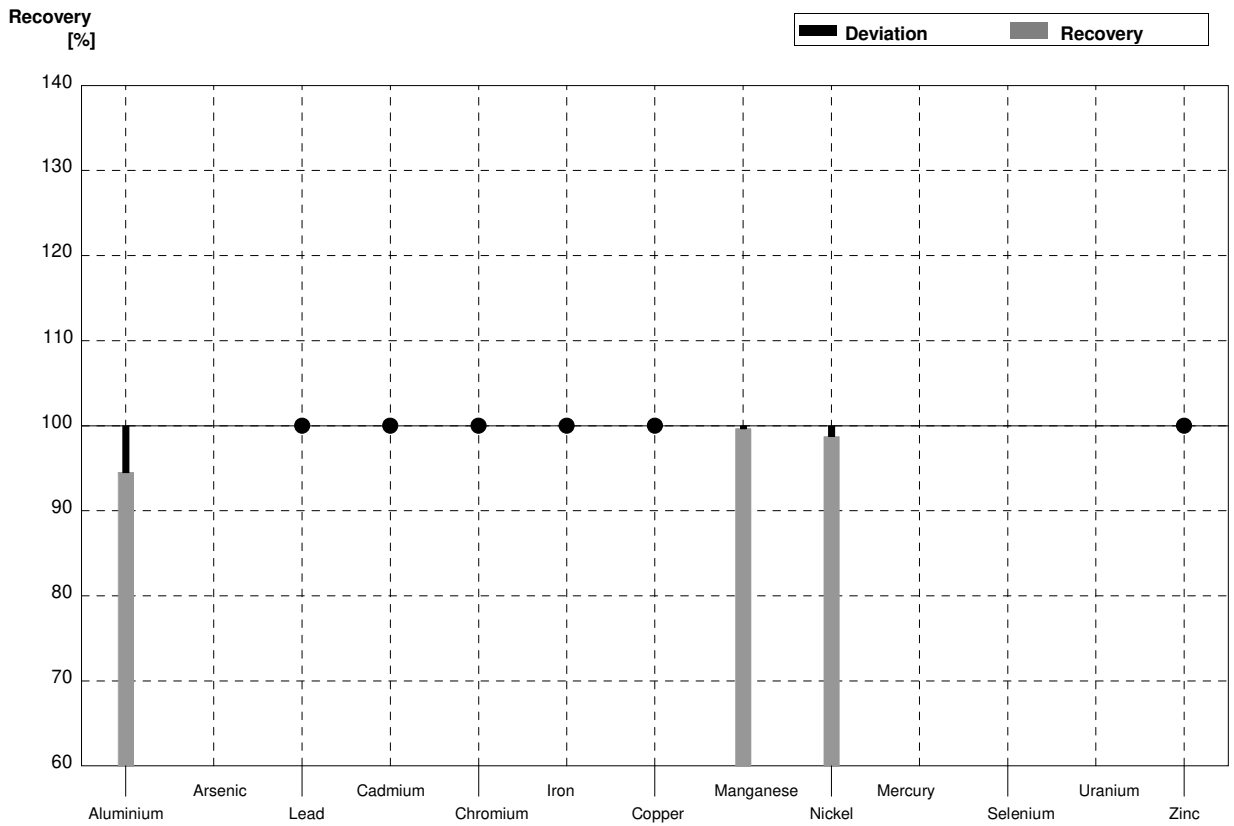
Eignungsprüfungsrunde / Proficiency testing round  
M176

Metalle / Metals

Versand / Dispatch: 03.03.2025

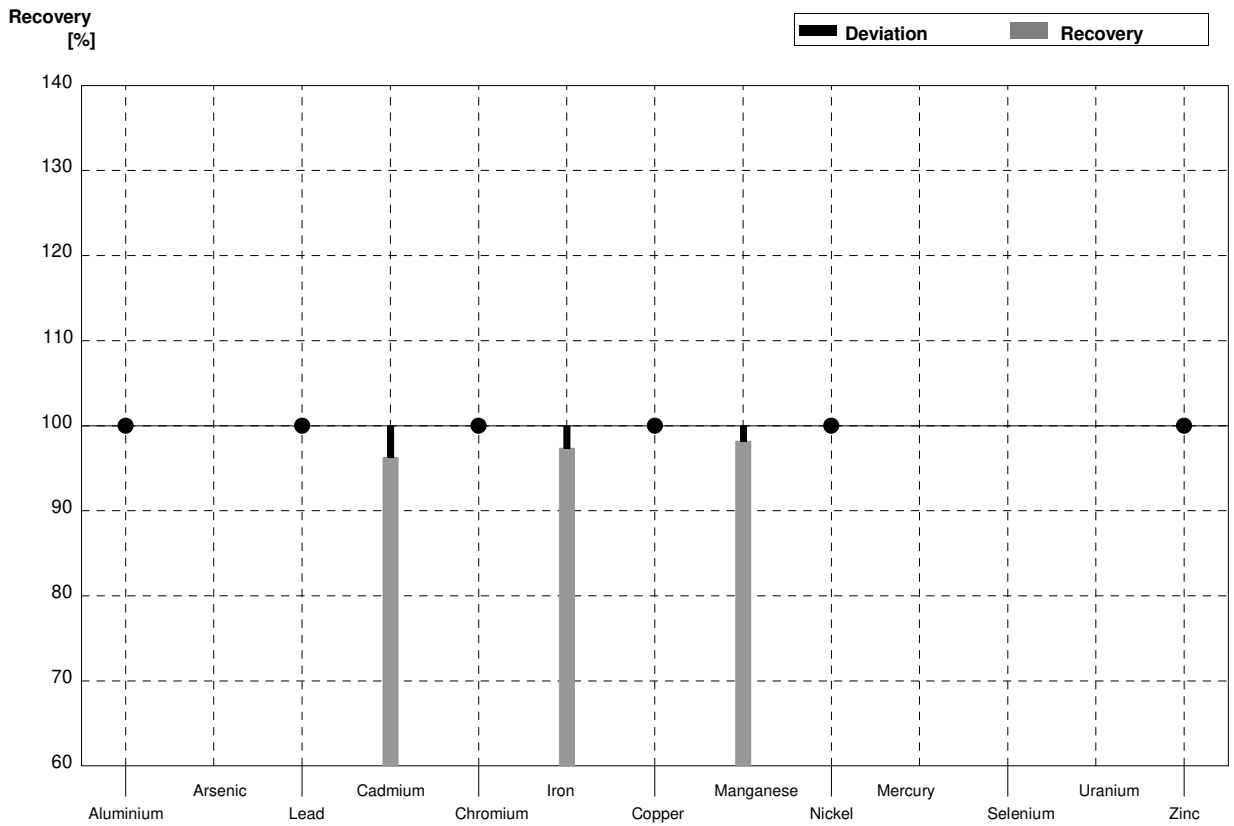
**Sample M176A**  
**Laboratory A**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	31,0	3,0	$\mu\text{g/l}$	95%
Arsenic	2,031	0,017			$\mu\text{g/l}$	
Lead	3,03	0,03	<6		$\mu\text{g/l}$	•
Cadmium	0,303	0,003	<0,5		$\mu\text{g/l}$	•
Chromium	3,65	0,03	<5		$\mu\text{g/l}$	•
Iron	18,3	0,2	<20		$\mu\text{g/l}$	•
Copper	7,91	0,10	<150		$\mu\text{g/l}$	•
Manganese	34,31	0,17	34,2	3,4	$\mu\text{g/l}$	100%
Nickel	5,57	0,05	5,5	0,8	$\mu\text{g/l}$	99%
Mercury	1,597	0,017			$\mu\text{g/l}$	
Selenium	0,91	0,02			$\mu\text{g/l}$	
Uranium	0,499	0,006			$\mu\text{g/l}$	
Zinc	20,0	3,6	<500		$\mu\text{g/l}$	•



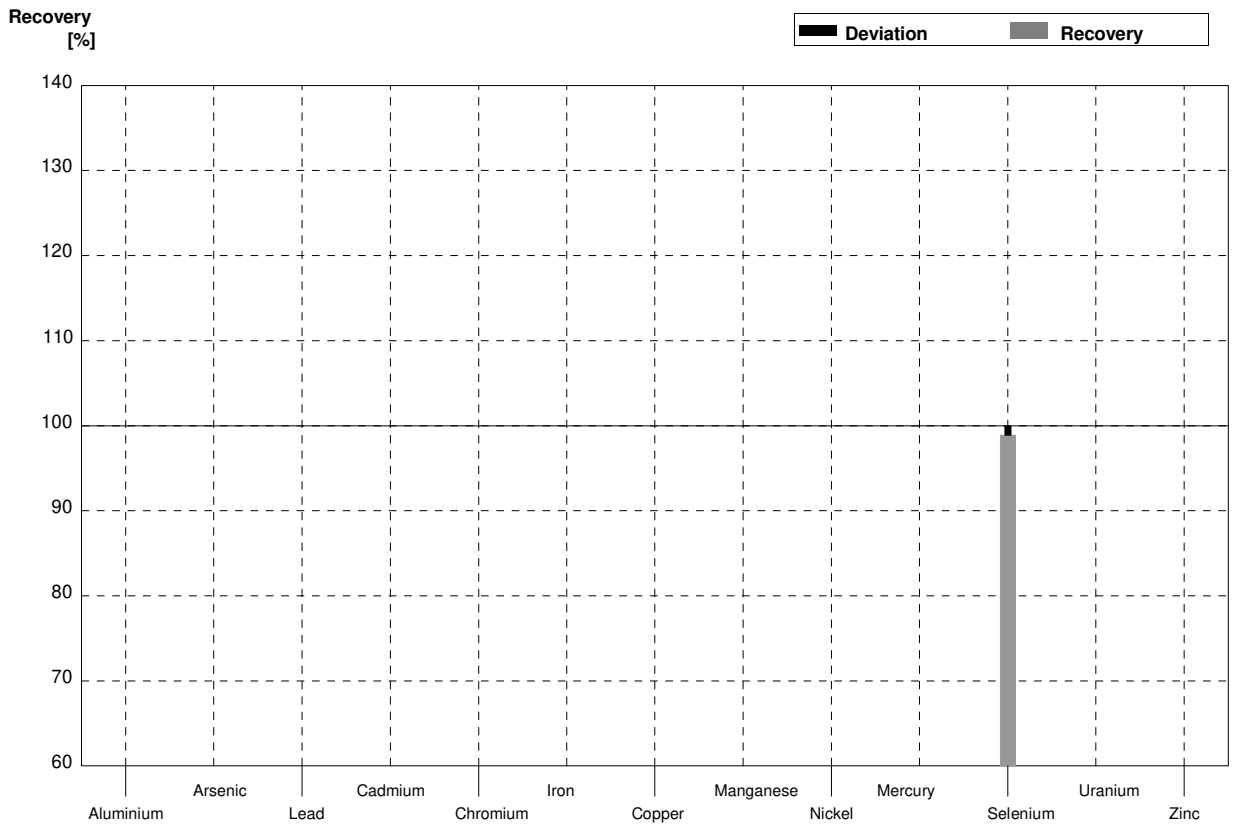
**Sample M176B**  
**Laboratory A**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	<20		$\mu\text{g/l}$	•
Arsenic	1,302	0,013			$\mu\text{g/l}$	
Lead	5,02	0,03	<6		$\mu\text{g/l}$	•
Cadmium	1,516	0,012	1,46	0,16	$\mu\text{g/l}$	96%
Chromium	0,800	0,011	<5		$\mu\text{g/l}$	•
Iron	68,8	0,3	67	11	$\mu\text{g/l}$	97%
Copper	4,07	0,03	<150		$\mu\text{g/l}$	•
Manganese	26,27	0,15	25,8	3,6	$\mu\text{g/l}$	98%
Nickel	4,16	0,04	<5		$\mu\text{g/l}$	•
Mercury	0,856	0,014			$\mu\text{g/l}$	
Selenium	1,61	0,02			$\mu\text{g/l}$	
Uranium	1,713	0,015			$\mu\text{g/l}$	
Zinc	81	4	<500		$\mu\text{g/l}$	•



**Sample M176A**  
**Laboratory B**

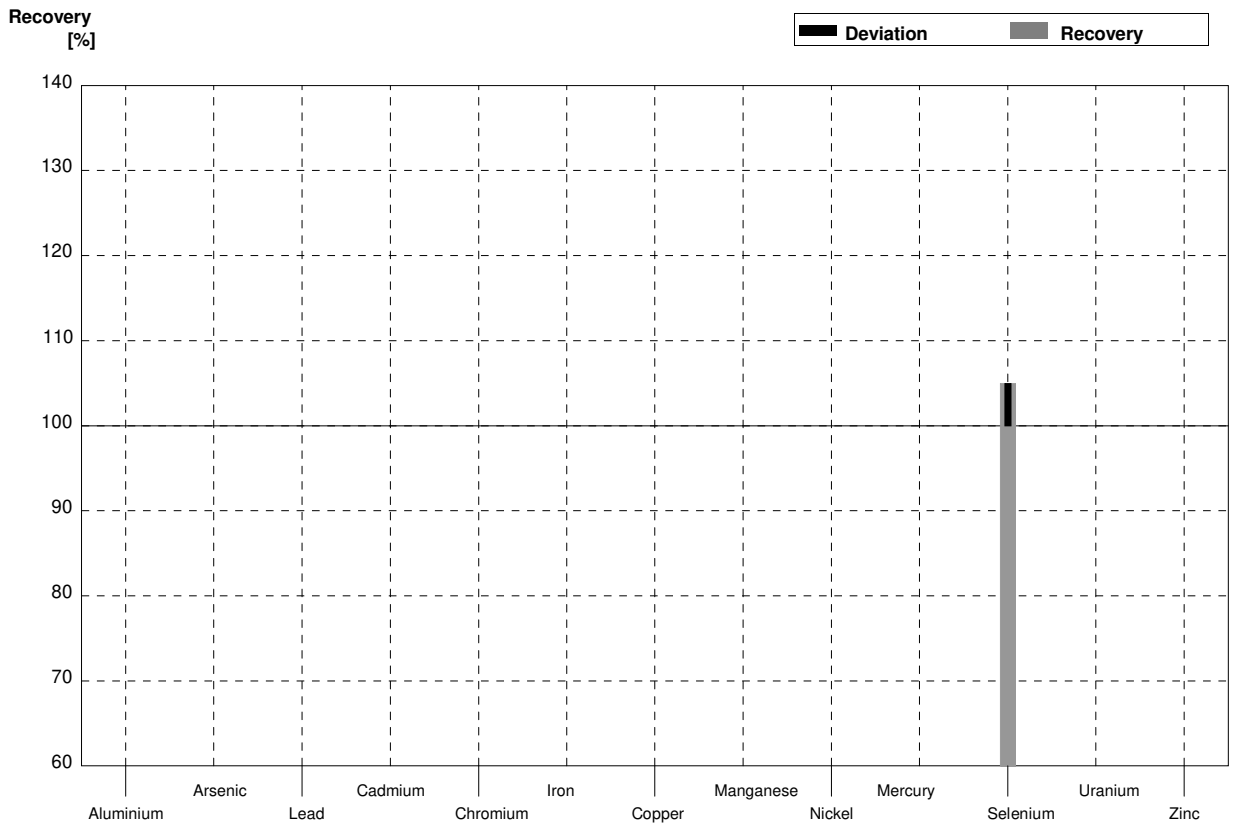
Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3			$\mu\text{g/l}$	
Arsenic	2,031	0,017			$\mu\text{g/l}$	
Lead	3,03	0,03			$\mu\text{g/l}$	
Cadmium	0,303	0,003			$\mu\text{g/l}$	
Chromium	3,65	0,03			$\mu\text{g/l}$	
Iron	18,3	0,2			$\mu\text{g/l}$	
Copper	7,91	0,10			$\mu\text{g/l}$	
Manganese	34,31	0,17			$\mu\text{g/l}$	
Nickel	5,57	0,05			$\mu\text{g/l}$	
Mercury	1,597	0,017			$\mu\text{g/l}$	
Selenium	0,91	0,02	0,90	0,065	$\mu\text{g/l}$	99%
Uranium	0,499	0,006			$\mu\text{g/l}$	
Zinc	20,0	3,6			$\mu\text{g/l}$	





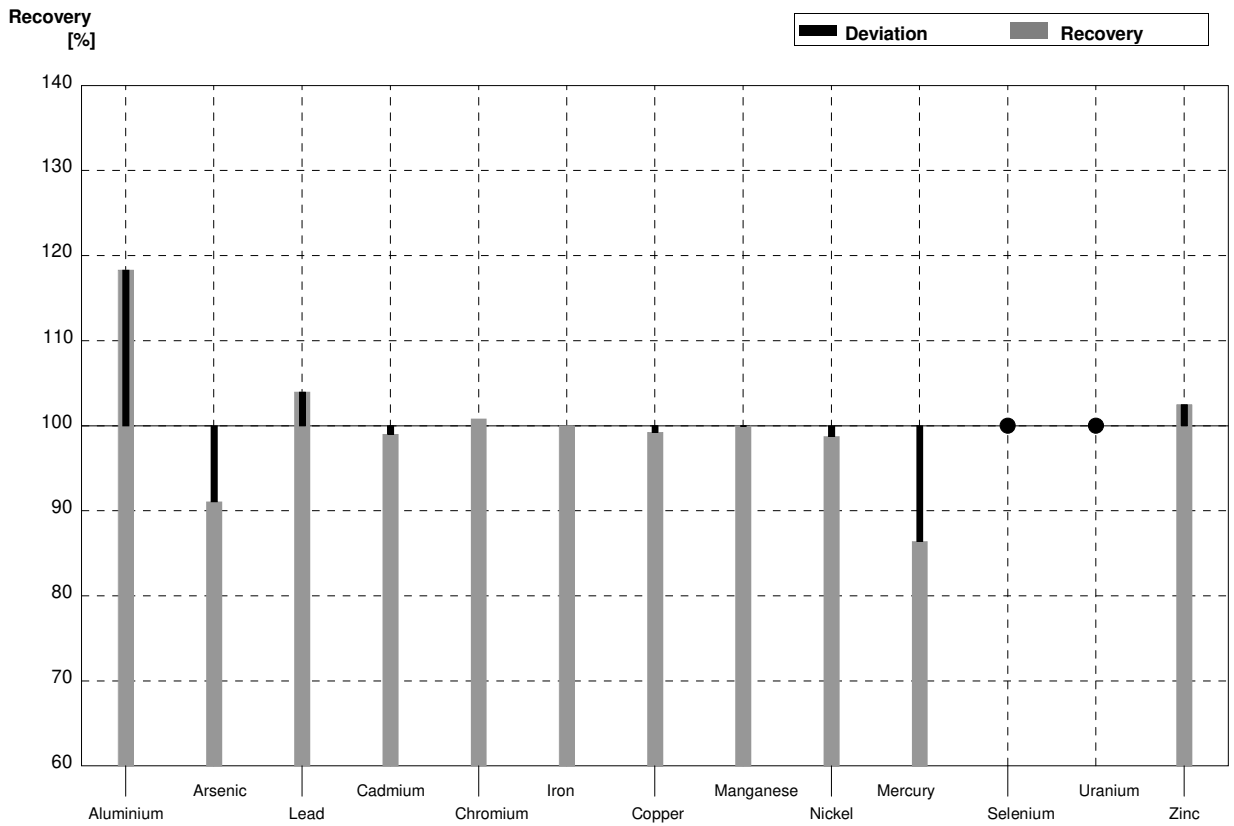
**Sample M176B**  
**Laboratory B**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18			$\mu\text{g/l}$	
Arsenic	1,302	0,013			$\mu\text{g/l}$	
Lead	5,02	0,03			$\mu\text{g/l}$	
Cadmium	1,516	0,012			$\mu\text{g/l}$	
Chromium	0,800	0,011			$\mu\text{g/l}$	
Iron	68,8	0,3			$\mu\text{g/l}$	
Copper	4,07	0,03			$\mu\text{g/l}$	
Manganese	26,27	0,15			$\mu\text{g/l}$	
Nickel	4,16	0,04			$\mu\text{g/l}$	
Mercury	0,856	0,014			$\mu\text{g/l}$	
Selenium	1,61	0,02	1,69	0,12	$\mu\text{g/l}$	105%
Uranium	1,713	0,015			$\mu\text{g/l}$	
Zinc	81	4			$\mu\text{g/l}$	



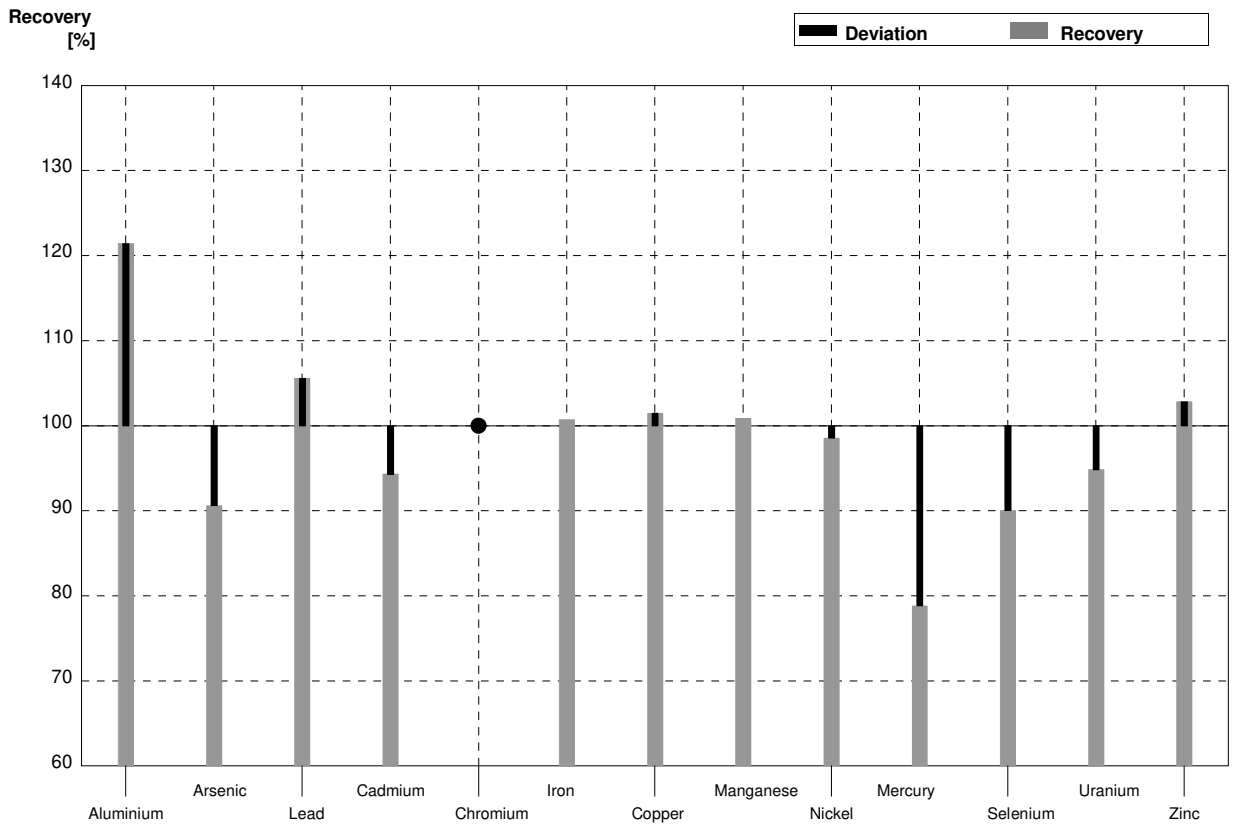
**Sample M176A**  
**Laboratory C**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	38,8	7,8	$\mu\text{g/l}$	118%
Arsenic	2,031	0,017	1,85	0,37	$\mu\text{g/l}$	91%
Lead	3,03	0,03	3,15	0,63	$\mu\text{g/l}$	104%
Cadmium	0,303	0,003	0,300	0,060	$\mu\text{g/l}$	99%
Chromium	3,65	0,03	3,68	0,74	$\mu\text{g/l}$	101%
Iron	18,3	0,2	18,3	3,7	$\mu\text{g/l}$	100%
Copper	7,91	0,10	7,85	1,6	$\mu\text{g/l}$	99%
Manganese	34,31	0,17	34,3	6,9	$\mu\text{g/l}$	100%
Nickel	5,57	0,05	5,50	1,1	$\mu\text{g/l}$	99%
Mercury	1,597	0,017	1,38	0,28	$\mu\text{g/l}$	86%
Selenium	0,91	0,02	<1		$\mu\text{g/l}$	•
Uranium	0,499	0,006	<1		$\mu\text{g/l}$	•
Zinc	20,0	3,6	20,5	4,1	$\mu\text{g/l}$	103%



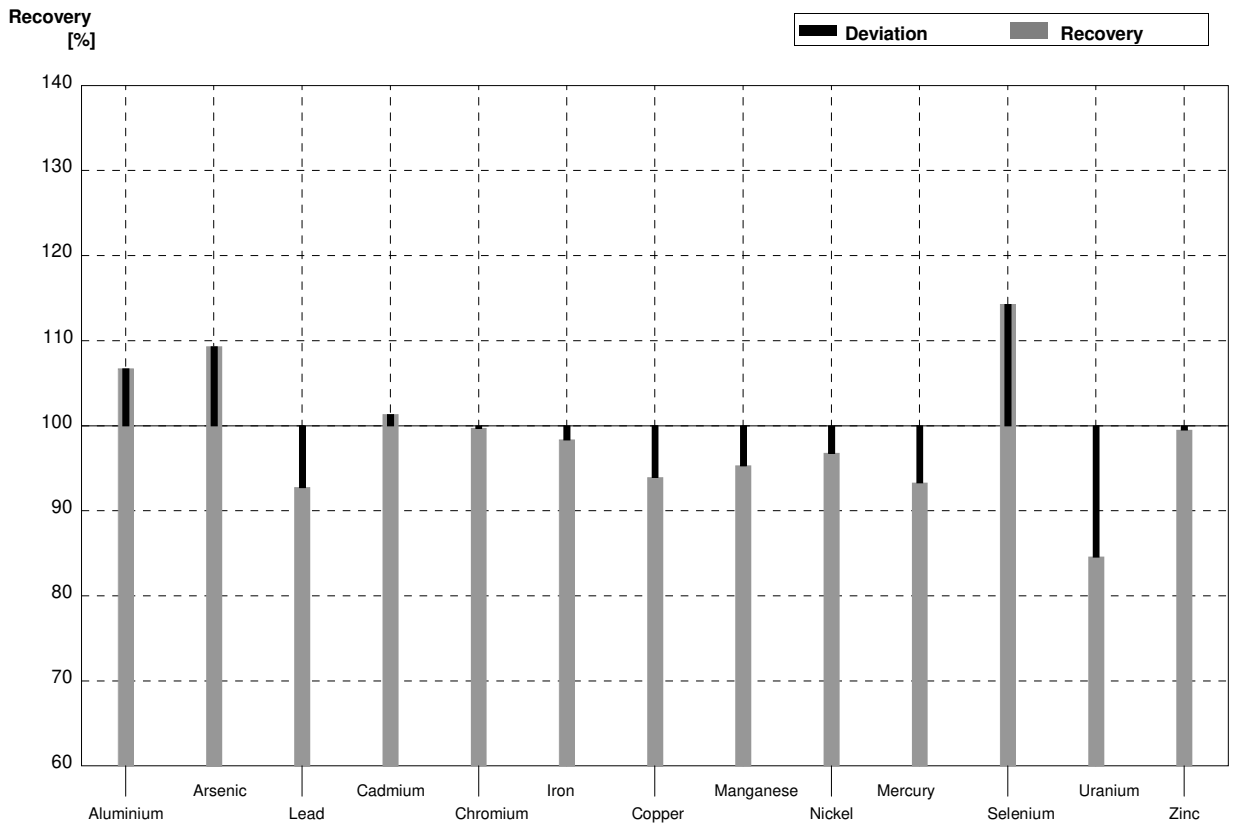
**Sample M176B**  
**Laboratory C**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	18,3	3,7	$\mu\text{g/l}$	121%
Arsenic	1,302	0,013	1,18	0,24	$\mu\text{g/l}$	91%
Lead	5,02	0,03	5,30	1,1	$\mu\text{g/l}$	106%
Cadmium	1,516	0,012	1,43	0,29	$\mu\text{g/l}$	94%
Chromium	0,800	0,011	<1		$\mu\text{g/l}$	•
Iron	68,8	0,3	69,3	14	$\mu\text{g/l}$	101%
Copper	4,07	0,03	4,13	0,83	$\mu\text{g/l}$	101%
Manganese	26,27	0,15	26,5	5,3	$\mu\text{g/l}$	101%
Nickel	4,16	0,04	4,10	0,82	$\mu\text{g/l}$	99%
Mercury	0,856	0,014	0,675	0,14	$\mu\text{g/l}$	79%
Selenium	1,61	0,02	1,45	0,29	$\mu\text{g/l}$	90%
Uranium	1,713	0,015	1,625	0,325	$\mu\text{g/l}$	95%
Zinc	81	4	83,3	16	$\mu\text{g/l}$	103%



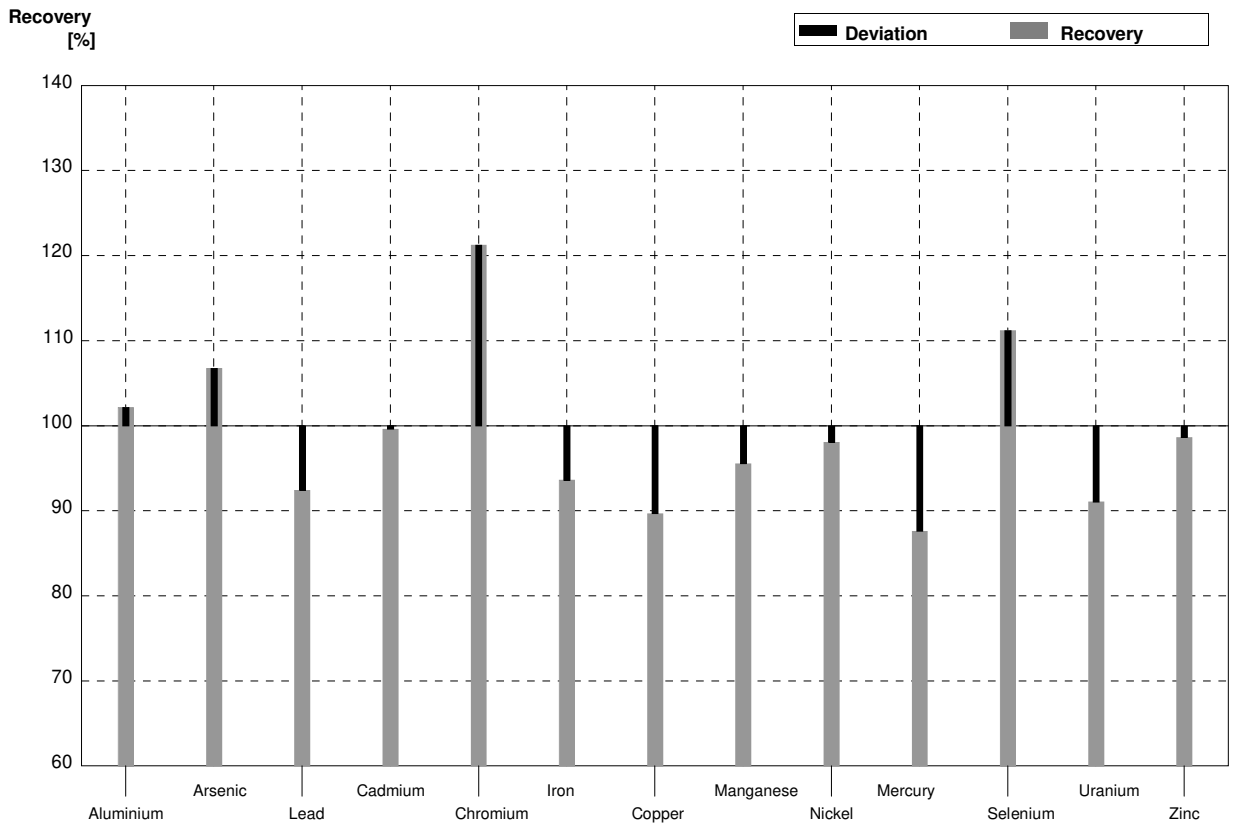
**Sample M176A**  
**Laboratory D**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	35,0		$\mu\text{g/l}$	107%
Arsenic	2,031	0,017	2,22		$\mu\text{g/l}$	109%
Lead	3,03	0,03	2,81		$\mu\text{g/l}$	93%
Cadmium	0,303	0,003	0,307		$\mu\text{g/l}$	101%
Chromium	3,65	0,03	3,64		$\mu\text{g/l}$	100%
Iron	18,3	0,2	18,0		$\mu\text{g/l}$	98%
Copper	7,91	0,10	7,43		$\mu\text{g/l}$	94%
Manganese	34,31	0,17	32,7		$\mu\text{g/l}$	95%
Nickel	5,57	0,05	5,39		$\mu\text{g/l}$	97%
Mercury	1,597	0,017	1,49		$\mu\text{g/l}$	93%
Selenium	0,91	0,02	1,04		$\mu\text{g/l}$	114%
Uranium	0,499	0,006	0,422		$\mu\text{g/l}$	85%
Zinc	20,0	3,6	19,9		$\mu\text{g/l}$	100%



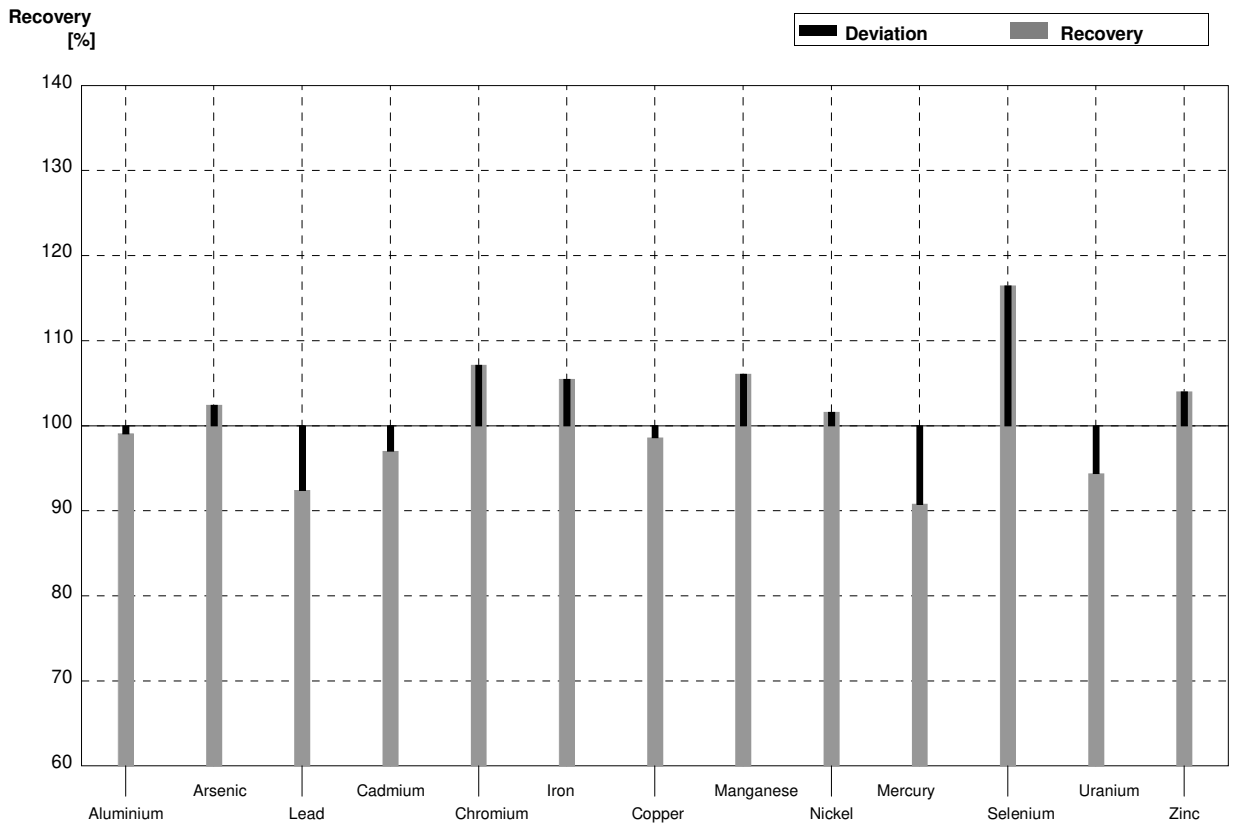
**Sample M176B**  
**Laboratory D**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	15,4		$\mu\text{g/l}$	102%
Arsenic	1,302	0,013	1,39		$\mu\text{g/l}$	107%
Lead	5,02	0,03	4,64		$\mu\text{g/l}$	92%
Cadmium	1,516	0,012	1,51		$\mu\text{g/l}$	100%
Chromium	0,800	0,011	0,97		$\mu\text{g/l}$	121%
Iron	68,8	0,3	64,4		$\mu\text{g/l}$	94%
Copper	4,07	0,03	3,65		$\mu\text{g/l}$	90%
Manganese	26,27	0,15	25,1		$\mu\text{g/l}$	96%
Nickel	4,16	0,04	4,08		$\mu\text{g/l}$	98%
Mercury	0,856	0,014	0,75		$\mu\text{g/l}$	88%
Selenium	1,61	0,02	1,79		$\mu\text{g/l}$	111%
Uranium	1,713	0,015	1,56		$\mu\text{g/l}$	91%
Zinc	81	4	79,9		$\mu\text{g/l}$	99%



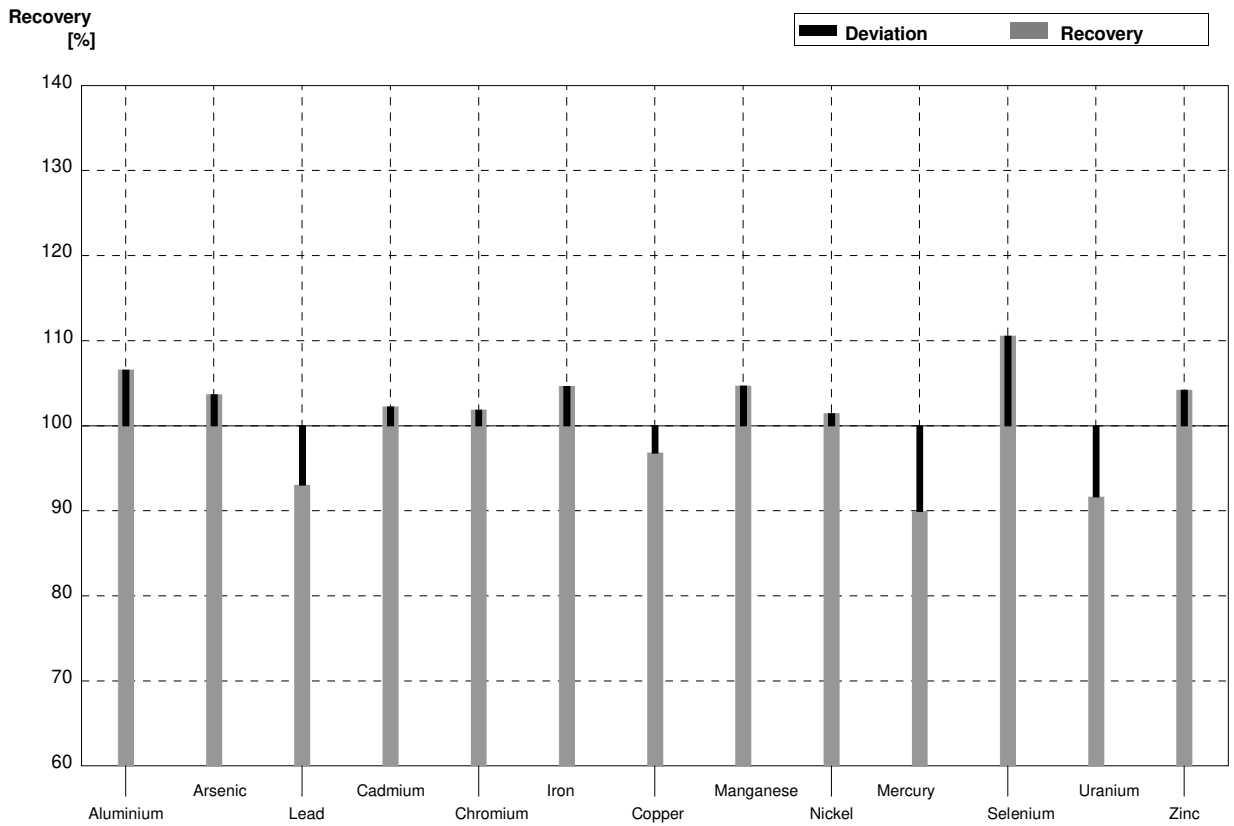
**Sample M176A**  
**Laboratory E**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	32,5		$\mu\text{g/l}$	99%
Arsenic	2,031	0,017	2,08		$\mu\text{g/l}$	102%
Lead	3,03	0,03	2,80		$\mu\text{g/l}$	92%
Cadmium	0,303	0,003	0,294		$\mu\text{g/l}$	97%
Chromium	3,65	0,03	3,91		$\mu\text{g/l}$	107%
Iron	18,3	0,2	19,3		$\mu\text{g/l}$	105%
Copper	7,91	0,10	7,80		$\mu\text{g/l}$	99%
Manganese	34,31	0,17	36,4		$\mu\text{g/l}$	106%
Nickel	5,57	0,05	5,66		$\mu\text{g/l}$	102%
Mercury	1,597	0,017	1,45		$\mu\text{g/l}$	91%
Selenium	0,91	0,02	1,06		$\mu\text{g/l}$	116%
Uranium	0,499	0,006	0,471		$\mu\text{g/l}$	94%
Zinc	20,0	3,6	20,8		$\mu\text{g/l}$	104%



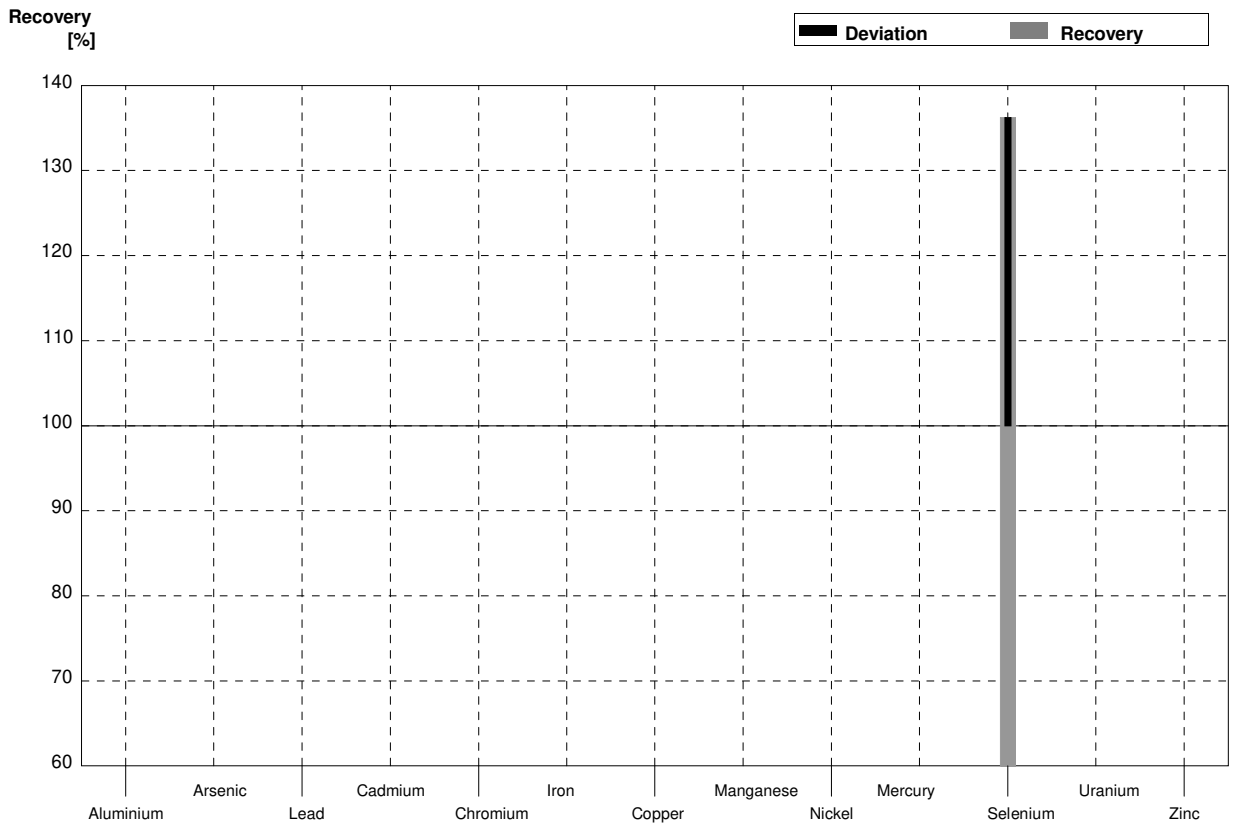
**Sample M176B**  
**Laboratory E**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	16,06		$\mu\text{g/l}$	107%
Arsenic	1,302	0,013	1,35		$\mu\text{g/l}$	104%
Lead	5,02	0,03	4,67		$\mu\text{g/l}$	93%
Cadmium	1,516	0,012	1,55		$\mu\text{g/l}$	102%
Chromium	0,800	0,011	0,815		$\mu\text{g/l}$	102%
Iron	68,8	0,3	72,0		$\mu\text{g/l}$	105%
Copper	4,07	0,03	3,94		$\mu\text{g/l}$	97%
Manganese	26,27	0,15	27,5		$\mu\text{g/l}$	105%
Nickel	4,16	0,04	4,22		$\mu\text{g/l}$	101%
Mercury	0,856	0,014	0,77		$\mu\text{g/l}$	90%
Selenium	1,61	0,02	1,78		$\mu\text{g/l}$	111%
Uranium	1,713	0,015	1,57		$\mu\text{g/l}$	92%
Zinc	81	4	84,4		$\mu\text{g/l}$	104%



**Sample M176A**  
**Laboratory F**

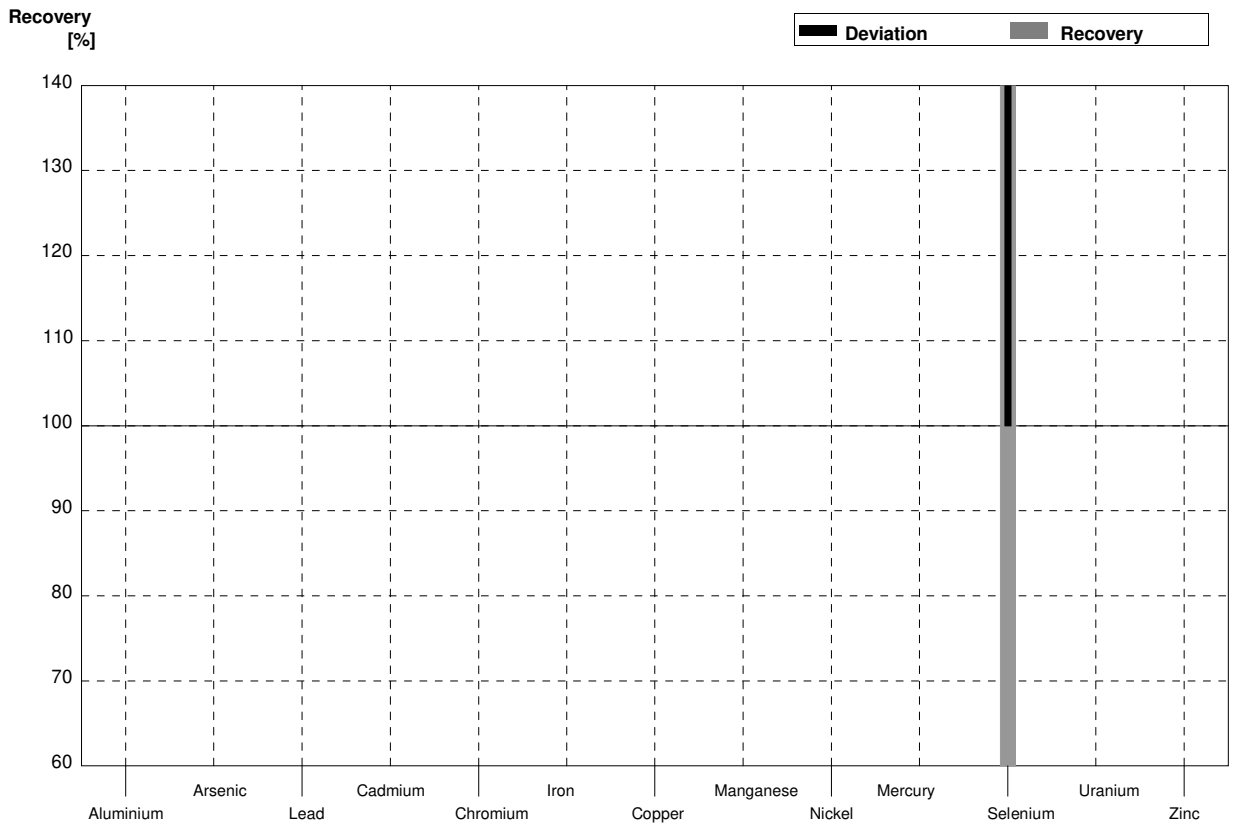
Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3			$\mu\text{g/l}$	
Arsenic	2,031	0,017			$\mu\text{g/l}$	
Lead	3,03	0,03			$\mu\text{g/l}$	
Cadmium	0,303	0,003			$\mu\text{g/l}$	
Chromium	3,65	0,03			$\mu\text{g/l}$	
Iron	18,3	0,2			$\mu\text{g/l}$	
Copper	7,91	0,10			$\mu\text{g/l}$	
Manganese	34,31	0,17			$\mu\text{g/l}$	
Nickel	5,57	0,05			$\mu\text{g/l}$	
Mercury	1,597	0,017			$\mu\text{g/l}$	
Selenium	0,91	0,02	1,24	0,25	$\mu\text{g/l}$	136%
Uranium	0,499	0,006			$\mu\text{g/l}$	
Zinc	20,0	3,6			$\mu\text{g/l}$	





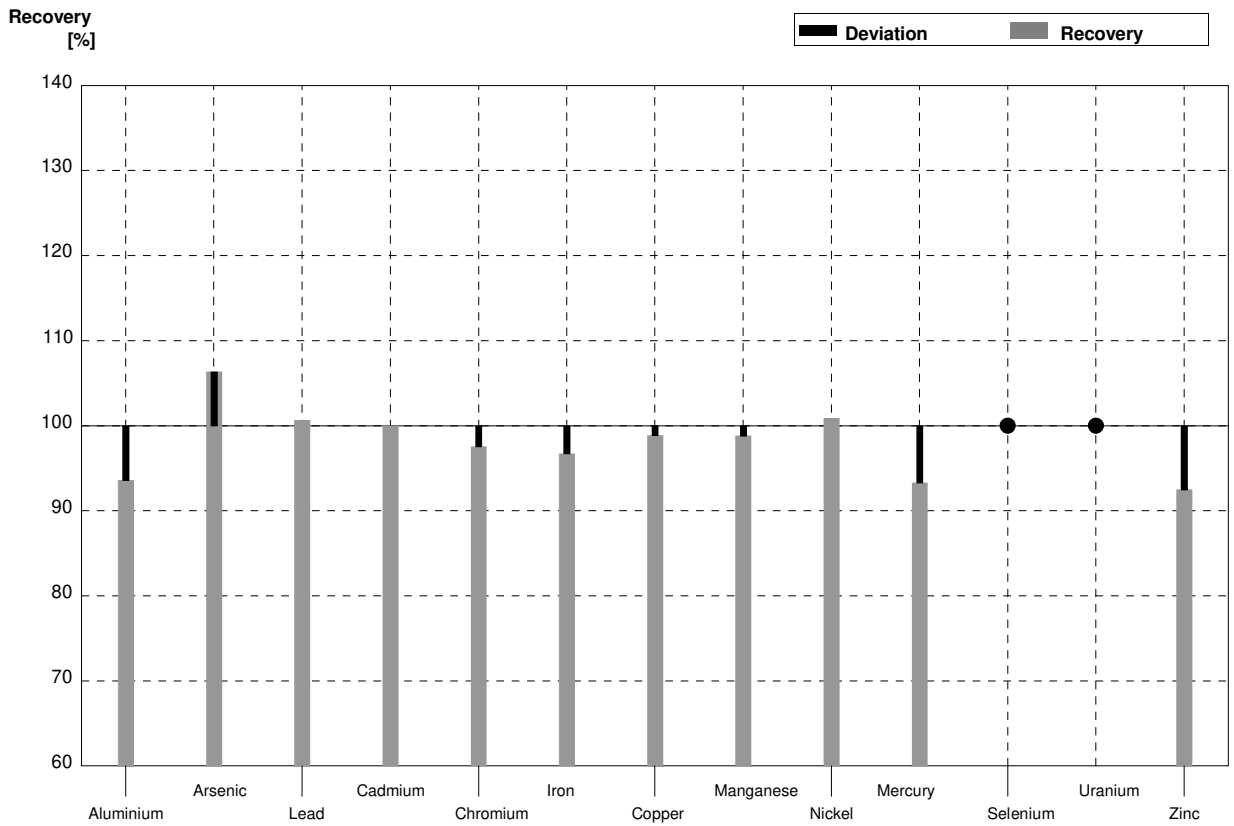
**Sample M176B**  
**Laboratory F**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18			$\mu\text{g/l}$	
Arsenic	1,302	0,013			$\mu\text{g/l}$	
Lead	5,02	0,03			$\mu\text{g/l}$	
Cadmium	1,516	0,012			$\mu\text{g/l}$	
Chromium	0,800	0,011			$\mu\text{g/l}$	
Iron	68,8	0,3			$\mu\text{g/l}$	
Copper	4,07	0,03			$\mu\text{g/l}$	
Manganese	26,27	0,15			$\mu\text{g/l}$	
Nickel	4,16	0,04			$\mu\text{g/l}$	
Mercury	0,856	0,014			$\mu\text{g/l}$	
Selenium	1,61	0,02	2,28	0,46	$\mu\text{g/l}$	142%
Uranium	1,713	0,015			$\mu\text{g/l}$	
Zinc	81	4			$\mu\text{g/l}$	



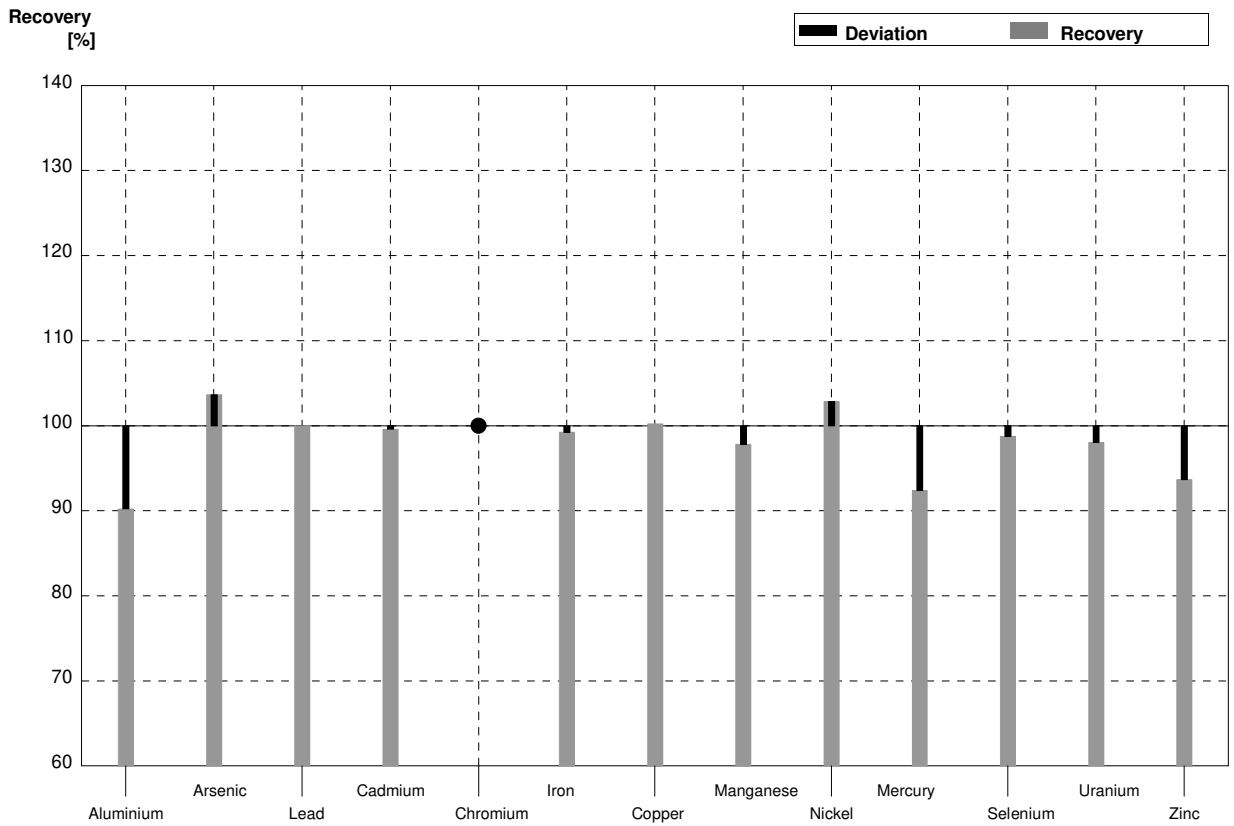
**Sample M176A**  
**Laboratory G**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	30,7	0,847	$\mu\text{g/l}$	94%
Arsenic	2,031	0,017	2,16	0,0885	$\mu\text{g/l}$	106%
Lead	3,03	0,03	3,05	0,0430	$\mu\text{g/l}$	101%
Cadmium	0,303	0,003	0,303	0,00725	$\mu\text{g/l}$	100%
Chromium	3,65	0,03	3,56	0,221	$\mu\text{g/l}$	98%
Iron	18,3	0,2	17,7	0,356	$\mu\text{g/l}$	97%
Copper	7,91	0,10	7,82	0,0360	$\mu\text{g/l}$	99%
Manganese	34,31	0,17	33,9	0,527	$\mu\text{g/l}$	99%
Nickel	5,57	0,05	5,62	0,0883	$\mu\text{g/l}$	101%
Mercury	1,597	0,017	1,49	0,017	$\mu\text{g/l}$	93%
Selenium	0,91	0,02	<1,00		$\mu\text{g/l}$	•
Uranium	0,499	0,006	<1,00		$\mu\text{g/l}$	•
Zinc	20,0	3,6	18,5	0,153	$\mu\text{g/l}$	93%



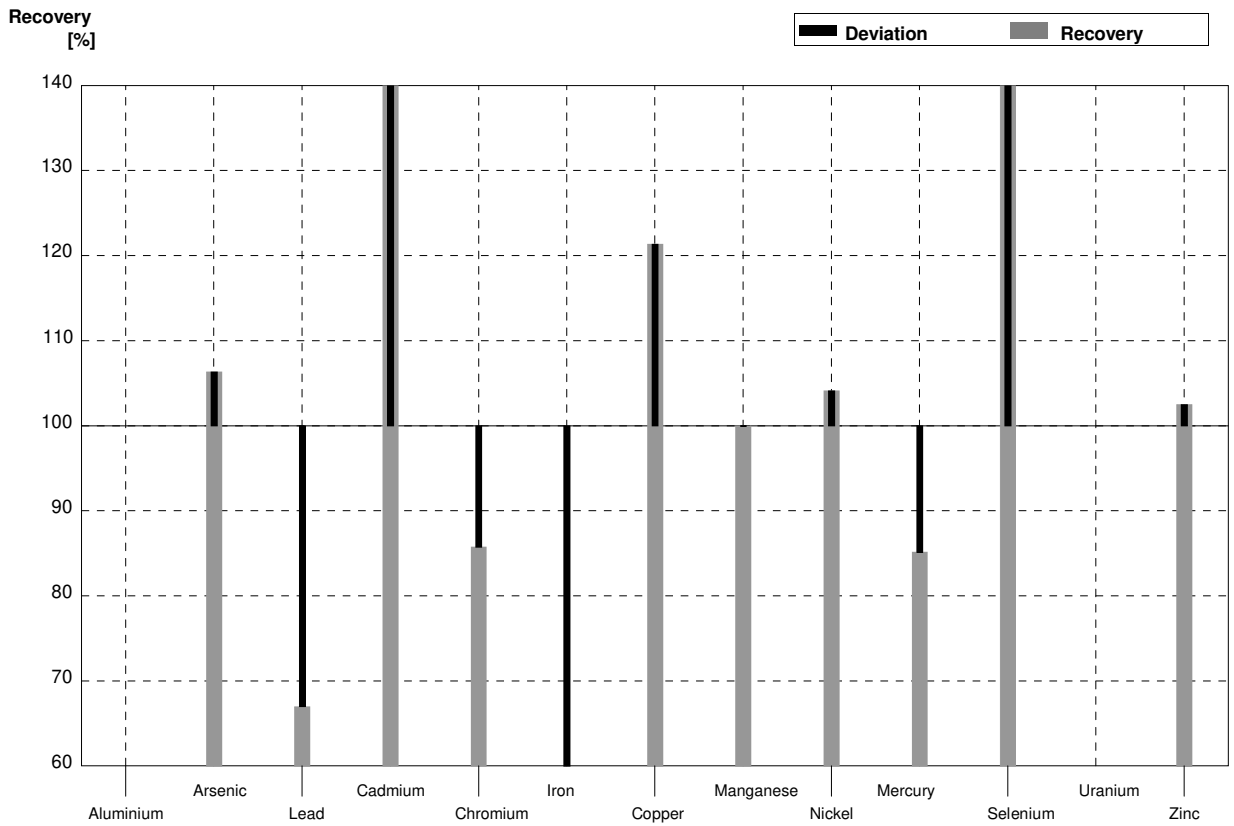
**Sample M176B**  
**Laboratory G**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	13,6	0,929	$\mu\text{g/l}$	90%
Arsenic	1,302	0,013	1,35	0,0928	$\mu\text{g/l}$	104%
Lead	5,02	0,03	5,02	0,0407	$\mu\text{g/l}$	100%
Cadmium	1,516	0,012	1,51	0,100	$\mu\text{g/l}$	100%
Chromium	0,800	0,011	<1,00		$\mu\text{g/l}$	•
Iron	68,8	0,3	68,3	0,320	$\mu\text{g/l}$	99%
Copper	4,07	0,03	4,08	0,0344	$\mu\text{g/l}$	100%
Manganese	26,27	0,15	25,7	0,547	$\mu\text{g/l}$	98%
Nickel	4,16	0,04	4,28	0,0896	$\mu\text{g/l}$	103%
Mercury	0,856	0,014	0,791	0,017	$\mu\text{g/l}$	92%
Selenium	1,61	0,02	1,59	0,106	$\mu\text{g/l}$	99%
Uranium	1,713	0,015	1,68	0,141	$\mu\text{g/l}$	98%
Zinc	81	4	75,9	0,149	$\mu\text{g/l}$	94%



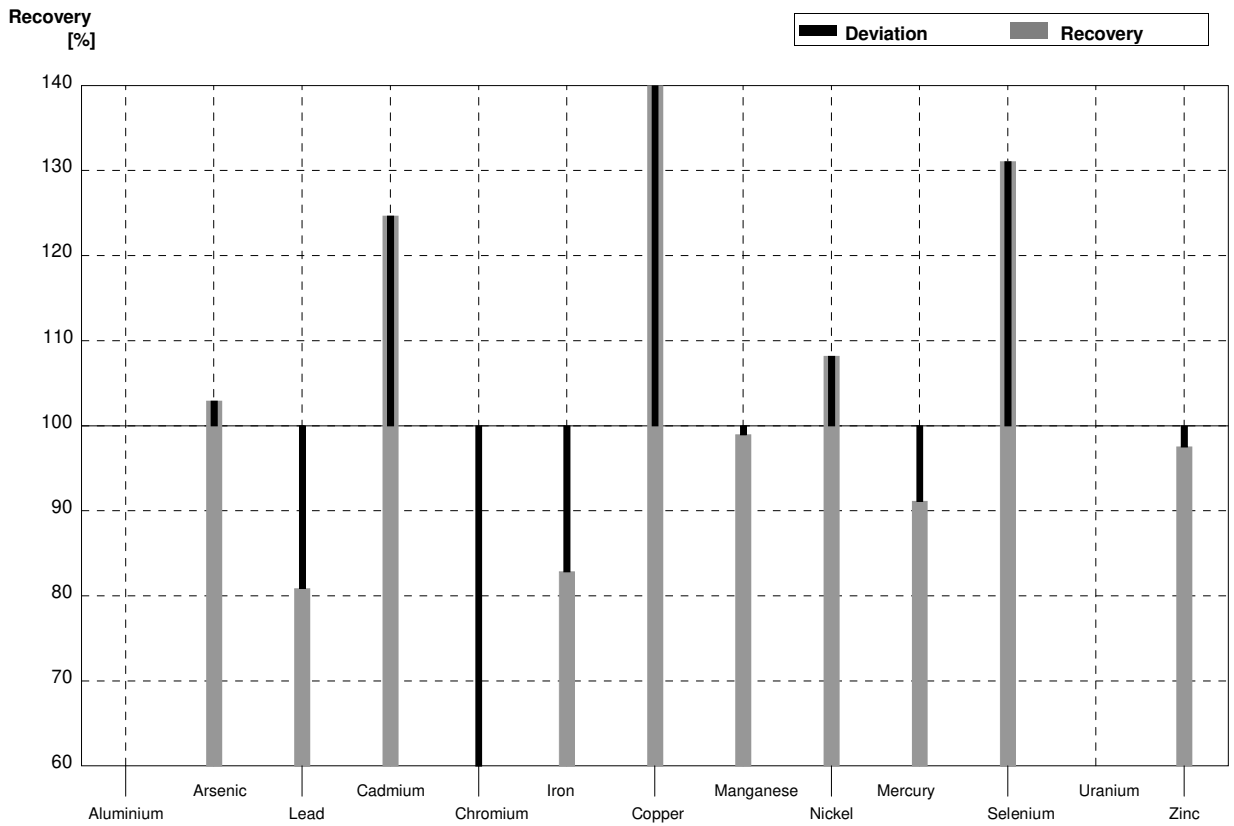
**Sample M176A**  
**Laboratory H**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3			$\mu\text{g/l}$	
Arsenic	2,031	0,017	2,16	0,13	$\mu\text{g/l}$	106%
Lead	3,03	0,03	2,03	0,10	$\mu\text{g/l}$	67%
Cadmium	0,303	0,003	0,69	0,03	$\mu\text{g/l}$	228%
Chromium	3,65	0,03	3,13	0,16	$\mu\text{g/l}$	86%
Iron	18,3	0,2	8,5	0,8	$\mu\text{g/l}$	46%
Copper	7,91	0,10	9,6	0,5	$\mu\text{g/l}$	121%
Manganese	34,31	0,17	34,3	1,9	$\mu\text{g/l}$	100%
Nickel	5,57	0,05	5,8	0,3	$\mu\text{g/l}$	104%
Mercury	1,597	0,017	1,36	0,26	$\mu\text{g/l}$	85%
Selenium	0,91	0,02	1,58	0,07	$\mu\text{g/l}$	174%
Uranium	0,499	0,006			$\mu\text{g/l}$	
Zinc	20,0	3,6	20,5	1,4	$\mu\text{g/l}$	103%



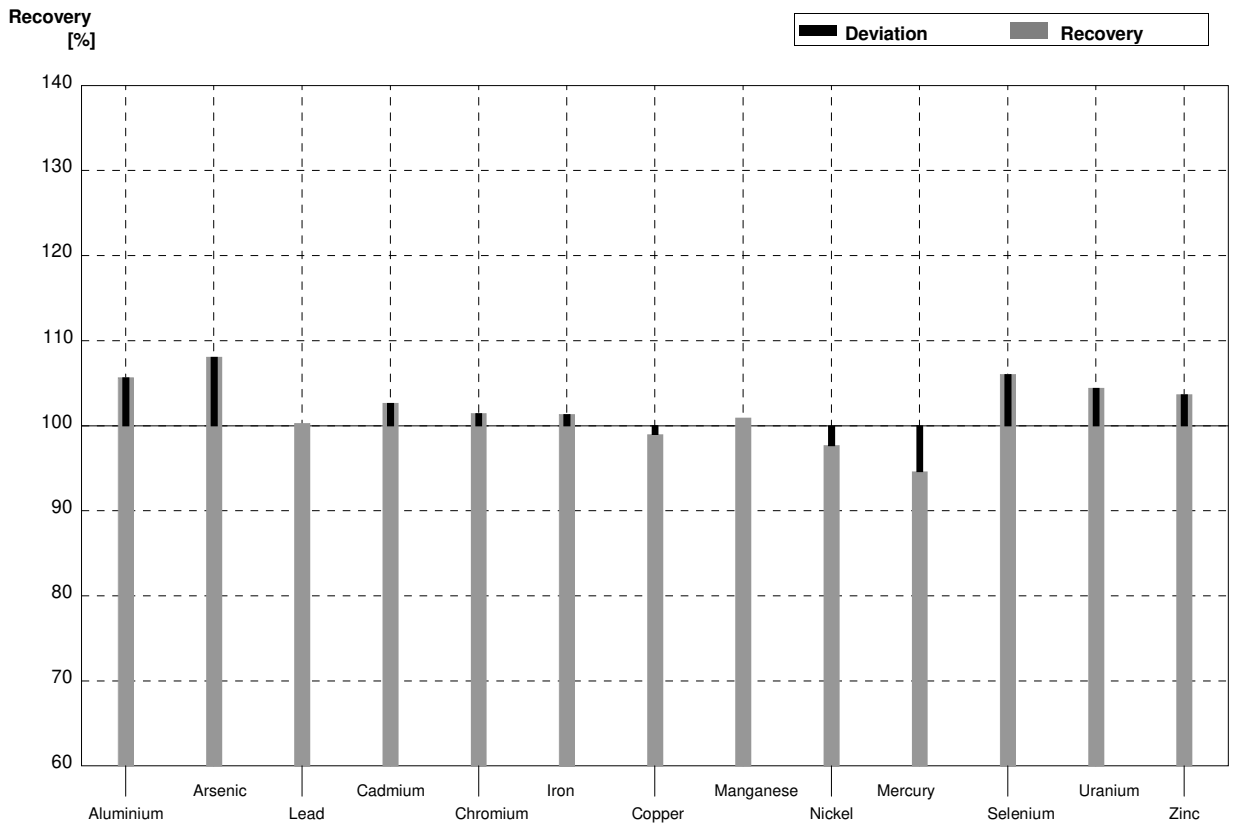
**Sample M176B**  
**Laboratory H**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18			$\mu\text{g/l}$	
Arsenic	1,302	0,013	1,34	0,08	$\mu\text{g/l}$	103%
Lead	5,02	0,03	4,06	0,21	$\mu\text{g/l}$	81%
Cadmium	1,516	0,012	1,89	0,09	$\mu\text{g/l}$	125%
Chromium	0,800	0,011	0,281	0,015	$\mu\text{g/l}$	35%
Iron	68,8	0,3	57	6	$\mu\text{g/l}$	83%
Copper	4,07	0,03	7,3	0,4	$\mu\text{g/l}$	179%
Manganese	26,27	0,15	26,0	1,4	$\mu\text{g/l}$	99%
Nickel	4,16	0,04	4,50	0,26	$\mu\text{g/l}$	108%
Mercury	0,856	0,014	0,78	0,15	$\mu\text{g/l}$	91%
Selenium	1,61	0,02	2,11	0,10	$\mu\text{g/l}$	131%
Uranium	1,713	0,015			$\mu\text{g/l}$	
Zinc	81	4	79	5	$\mu\text{g/l}$	98%



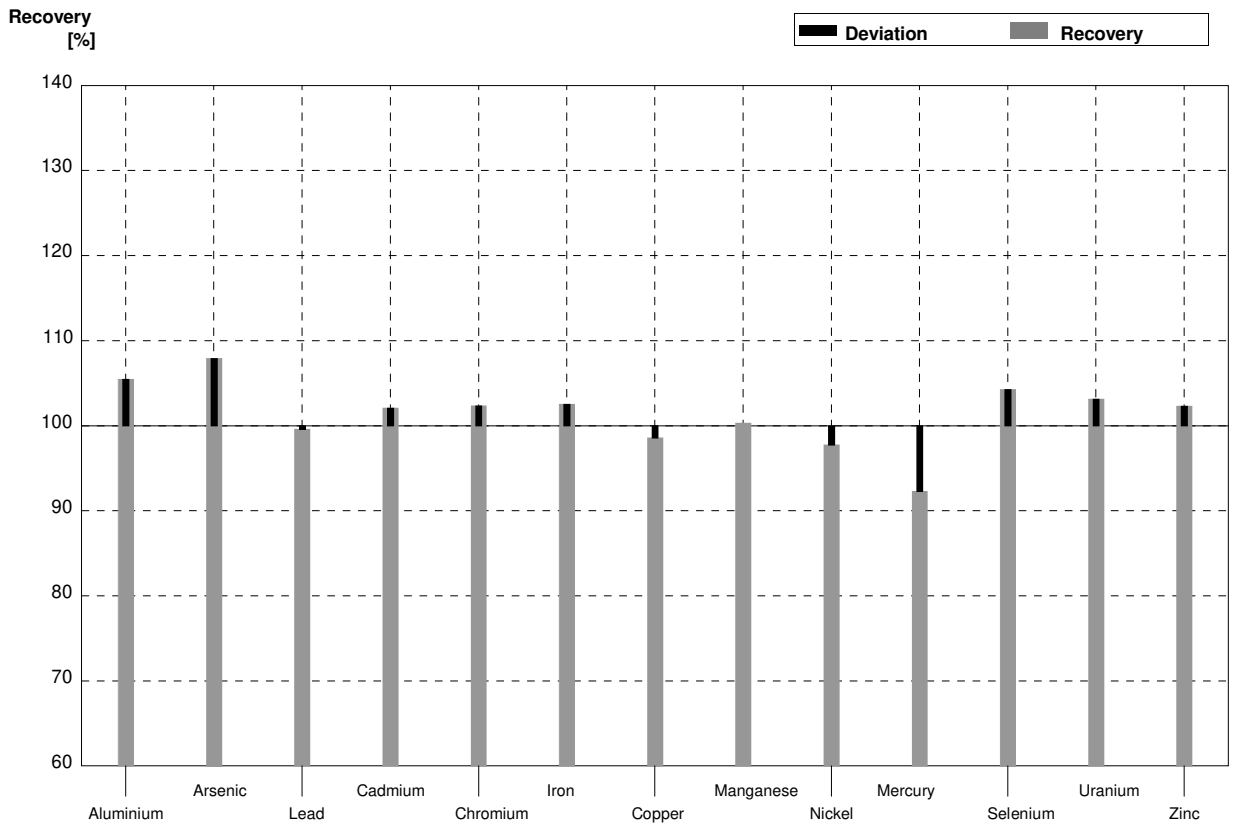
**Sample M176A**  
**Laboratory I**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	34,656	4,852	$\mu\text{g/l}$	106%
Arsenic	2,031	0,017	2,195	0,351	$\mu\text{g/l}$	108%
Lead	3,03	0,03	3,039	0,365	$\mu\text{g/l}$	100%
Cadmium	0,303	0,003	0,311	0,031	$\mu\text{g/l}$	103%
Chromium	3,65	0,03	3,703	0,444	$\mu\text{g/l}$	101%
Iron	18,3	0,2	18,548	2,226	$\mu\text{g/l}$	101%
Copper	7,91	0,10	7,829	1,096	$\mu\text{g/l}$	99%
Manganese	34,31	0,17	34,629	3,463	$\mu\text{g/l}$	101%
Nickel	5,57	0,05	5,441	0,653	$\mu\text{g/l}$	98%
Mercury	1,597	0,017	1,511	0,272	$\mu\text{g/l}$	95%
Selenium	0,91	0,02	0,965	0,154	$\mu\text{g/l}$	106%
Uranium	0,499	0,006	0,521	0,052	$\mu\text{g/l}$	104%
Zinc	20,0	3,6	20,739	2,489	$\mu\text{g/l}$	104%



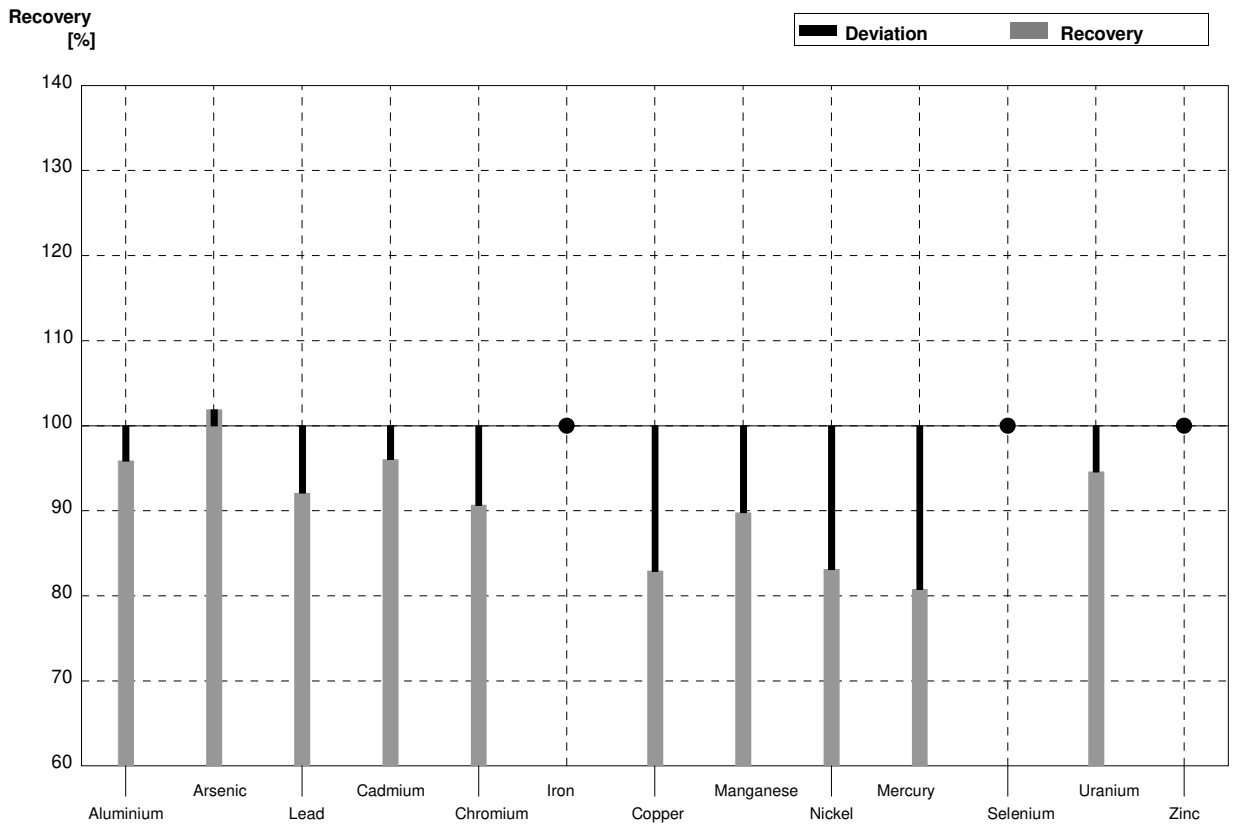
**Sample M176B**  
**Laboratory I**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	15,892	2,225	$\mu\text{g/l}$	105%
Arsenic	1,302	0,013	1,405	0,225	$\mu\text{g/l}$	108%
Lead	5,02	0,03	5,000	0,600	$\mu\text{g/l}$	100%
Cadmium	1,516	0,012	1,548	0,155	$\mu\text{g/l}$	102%
Chromium	0,800	0,011	0,819	0,098	$\mu\text{g/l}$	102%
Iron	68,8	0,3	70,541	8,465	$\mu\text{g/l}$	103%
Copper	4,07	0,03	4,012	0,562	$\mu\text{g/l}$	99%
Manganese	26,27	0,15	26,357	2,636	$\mu\text{g/l}$	100%
Nickel	4,16	0,04	4,067	0,488	$\mu\text{g/l}$	98%
Mercury	0,856	0,014	0,790	0,142	$\mu\text{g/l}$	92%
Selenium	1,61	0,02	1,679	0,269	$\mu\text{g/l}$	104%
Uranium	1,713	0,015	1,767	0,177	$\mu\text{g/l}$	103%
Zinc	81	4	82,865	9,944	$\mu\text{g/l}$	102%



**Sample M176A**  
**Laboratory J**

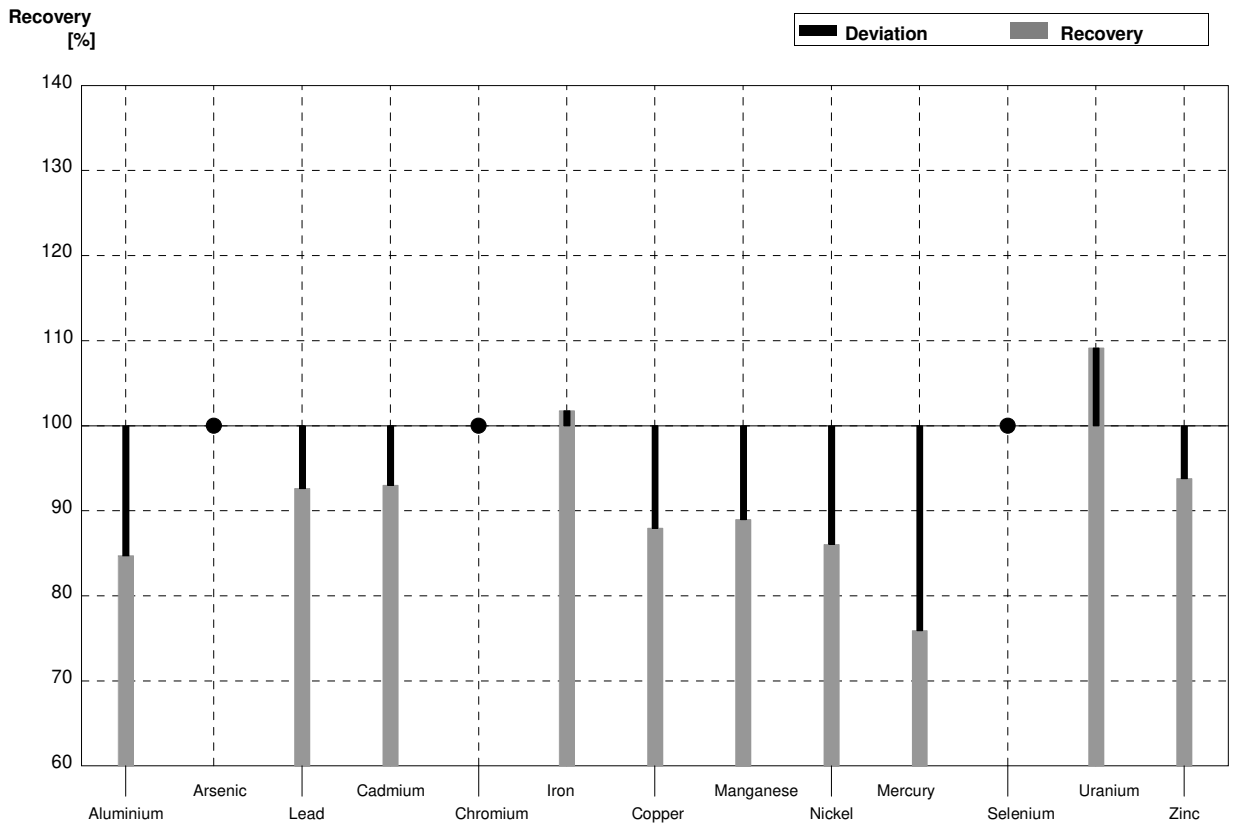
Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	31,45	7,86	$\mu\text{g/l}$	96%
Arsenic	2,031	0,017	2,07	0,62	$\mu\text{g/l}$	102%
Lead	3,03	0,03	2,79	0,84	$\mu\text{g/l}$	92%
Cadmium	0,303	0,003	0,291	0,07	$\mu\text{g/l}$	96%
Chromium	3,65	0,03	3,31	0,99	$\mu\text{g/l}$	91%
Iron	18,3	0,2	<50		$\mu\text{g/l}$	•
Copper	7,91	0,10	6,56	1,64	$\mu\text{g/l}$	83%
Manganese	34,31	0,17	30,81	9,24	$\mu\text{g/l}$	90%
Nickel	5,57	0,05	4,63	1,16	$\mu\text{g/l}$	83%
Mercury	1,597	0,017	1,29	0,39	$\mu\text{g/l}$	81%
Selenium	0,91	0,02	<2		$\mu\text{g/l}$	•
Uranium	0,499	0,006	0,472	0,142	$\mu\text{g/l}$	95%
Zinc	20,0	3,6	<30		$\mu\text{g/l}$	•





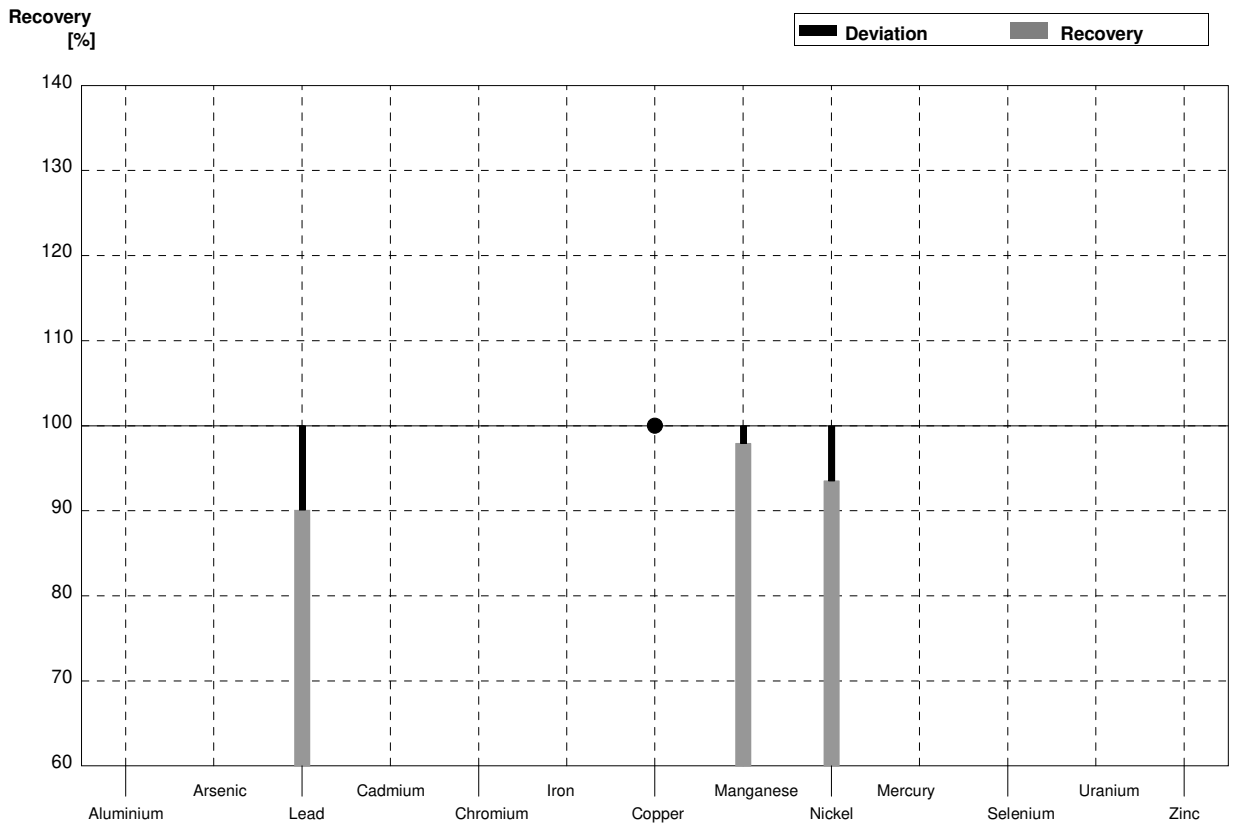
**Sample M176B**  
**Laboratory J**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	12,77	3,19	$\mu\text{g/l}$	85%
Arsenic	1,302	0,013	<2		$\mu\text{g/l}$	•
Lead	5,02	0,03	4,65	1,39	$\mu\text{g/l}$	93%
Cadmium	1,516	0,012	1,41	0,35	$\mu\text{g/l}$	93%
Chromium	0,800	0,011	<1		$\mu\text{g/l}$	•
Iron	68,8	0,3	70,03	21,01	$\mu\text{g/l}$	102%
Copper	4,07	0,03	3,58	0,89	$\mu\text{g/l}$	88%
Manganese	26,27	0,15	23,38	7,01	$\mu\text{g/l}$	89%
Nickel	4,16	0,04	3,58	0,89	$\mu\text{g/l}$	86%
Mercury	0,856	0,014	0,65	0,19	$\mu\text{g/l}$	76%
Selenium	1,61	0,02	<2		$\mu\text{g/l}$	•
Uranium	1,713	0,015	1,87	0,56	$\mu\text{g/l}$	109%
Zinc	81	4	75,99	22,80	$\mu\text{g/l}$	94%



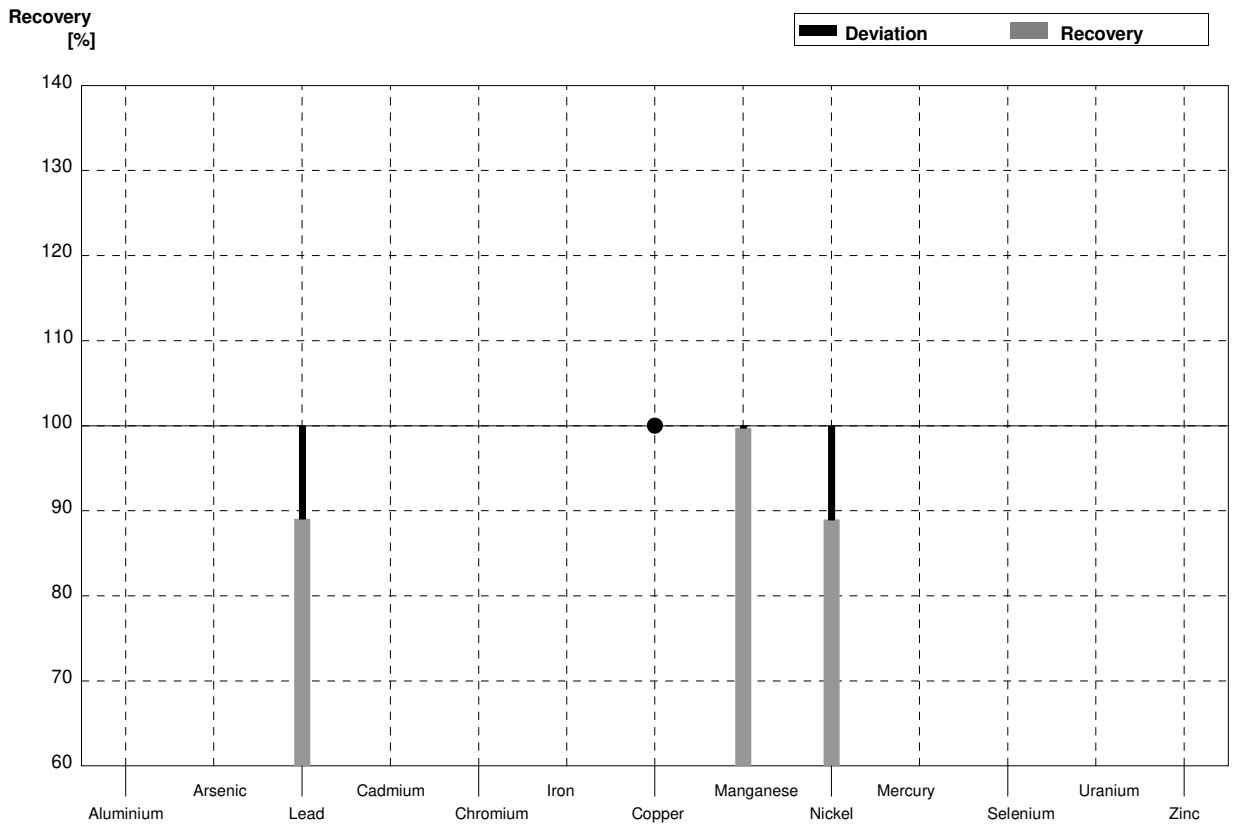
**Sample M176A**  
**Laboratory K**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3			$\mu\text{g/l}$	
Arsenic	2,031	0,017			$\mu\text{g/l}$	
Lead	3,03	0,03	2,73	0,2	$\mu\text{g/l}$	90%
Cadmium	0,303	0,003			$\mu\text{g/l}$	
Chromium	3,65	0,03			$\mu\text{g/l}$	
Iron	18,3	0,2			$\mu\text{g/l}$	
Copper	7,91	0,10	<100		$\mu\text{g/l}$	•
Manganese	34,31	0,17	33,6	2,9	$\mu\text{g/l}$	98%
Nickel	5,57	0,05	5,21	0,4	$\mu\text{g/l}$	94%
Mercury	1,597	0,017			$\mu\text{g/l}$	
Selenium	0,91	0,02			$\mu\text{g/l}$	
Uranium	0,499	0,006			$\mu\text{g/l}$	
Zinc	20,0	3,6			$\mu\text{g/l}$	



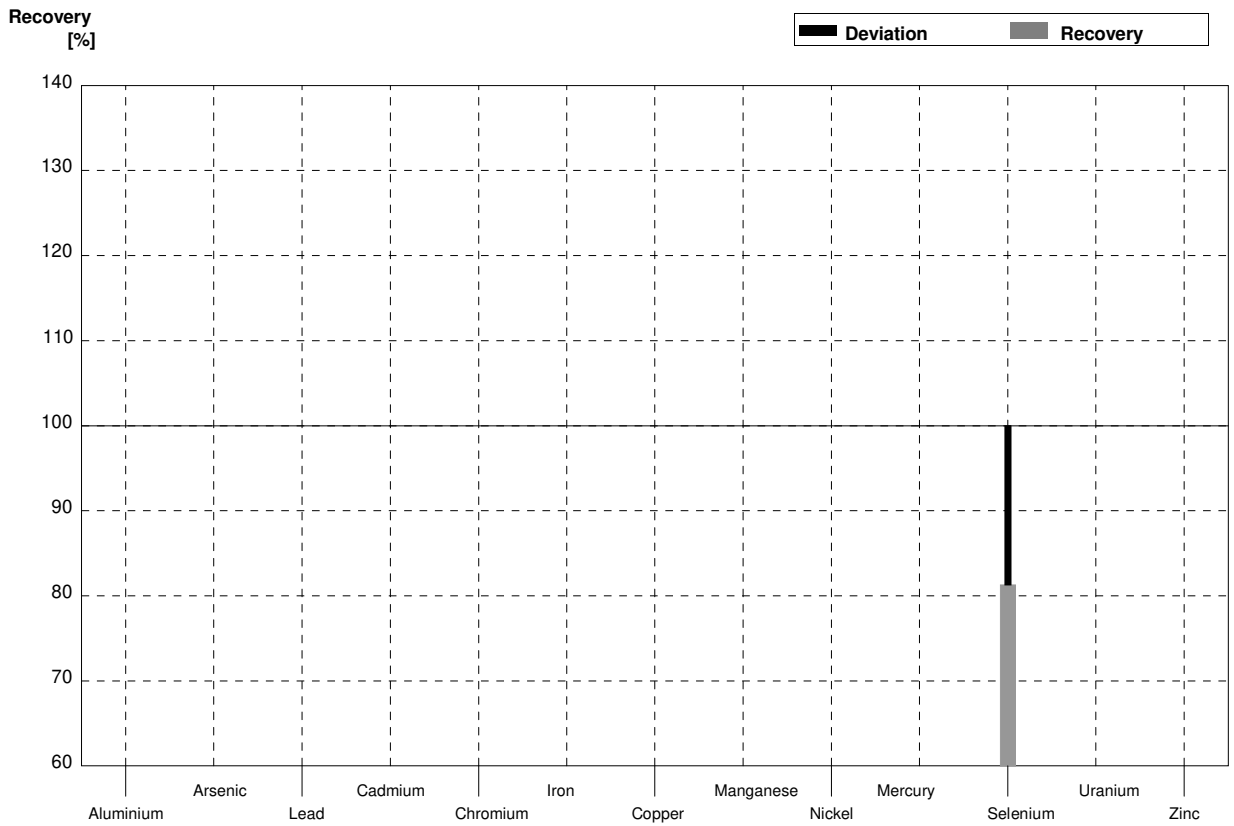
**Sample M176B**  
**Laboratory K**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18			$\mu\text{g/l}$	
Arsenic	1,302	0,013			$\mu\text{g/l}$	
Lead	5,02	0,03	4,47	0,4	$\mu\text{g/l}$	89%
Cadmium	1,516	0,012			$\mu\text{g/l}$	
Chromium	0,800	0,011			$\mu\text{g/l}$	
Iron	68,8	0,3			$\mu\text{g/l}$	
Copper	4,07	0,03	<100		$\mu\text{g/l}$	•
Manganese	26,27	0,15	26,2	2,3	$\mu\text{g/l}$	100%
Nickel	4,16	0,04	3,70	0,3	$\mu\text{g/l}$	89%
Mercury	0,856	0,014			$\mu\text{g/l}$	
Selenium	1,61	0,02			$\mu\text{g/l}$	
Uranium	1,713	0,015			$\mu\text{g/l}$	
Zinc	81	4			$\mu\text{g/l}$	



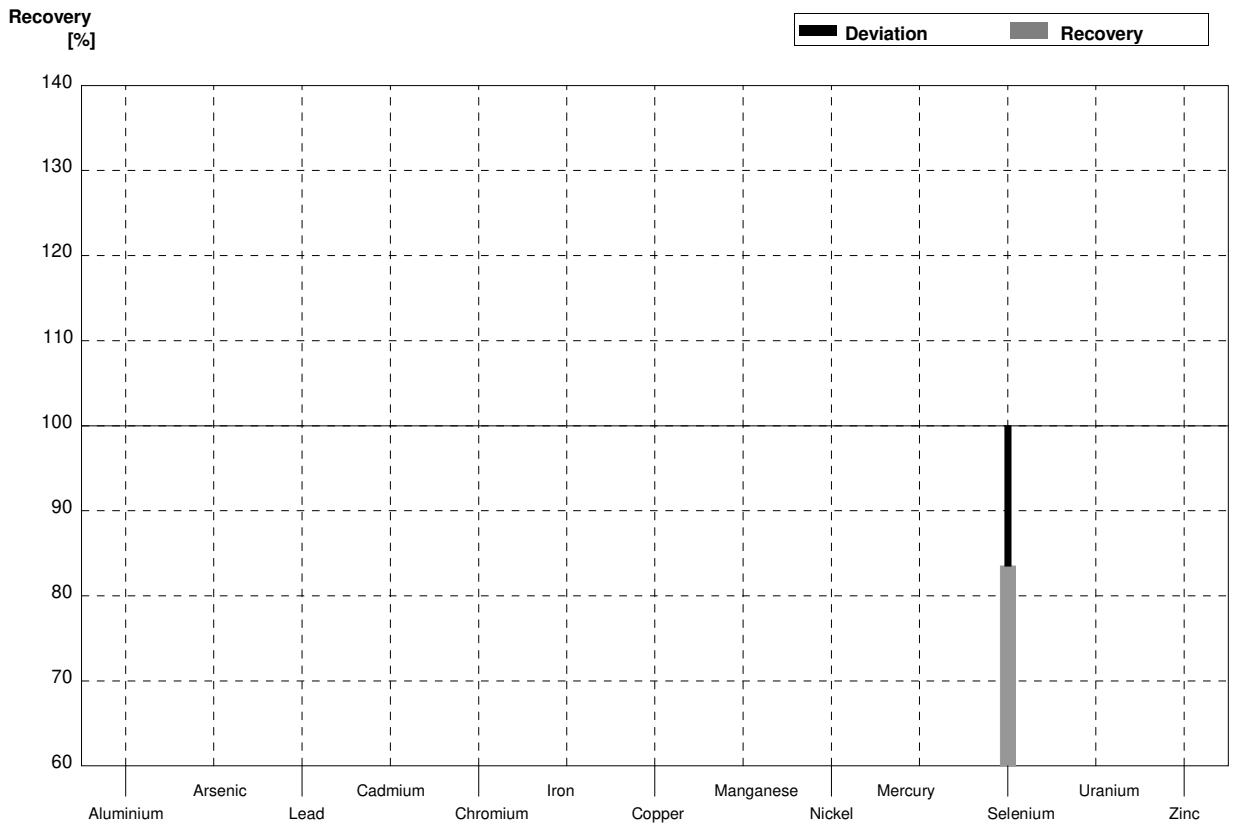
**Sample M176A**  
**Laboratory L**

Parameter	Assigned value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	32,8	0,3			µg/l	
Arsenic	2,031	0,017			µg/l	
Lead	3,03	0,03			µg/l	
Cadmium	0,303	0,003			µg/l	
Chromium	3,65	0,03			µg/l	
Iron	18,3	0,2			µg/l	
Copper	7,91	0,10			µg/l	
Manganese	34,31	0,17			µg/l	
Nickel	5,57	0,05			µg/l	
Mercury	1,597	0,017			µg/l	
Selenium	0,91	0,02	0,74	0,09	µg/l	81%
Uranium	0,499	0,006			µg/l	
Zinc	20,0	3,6			µg/l	



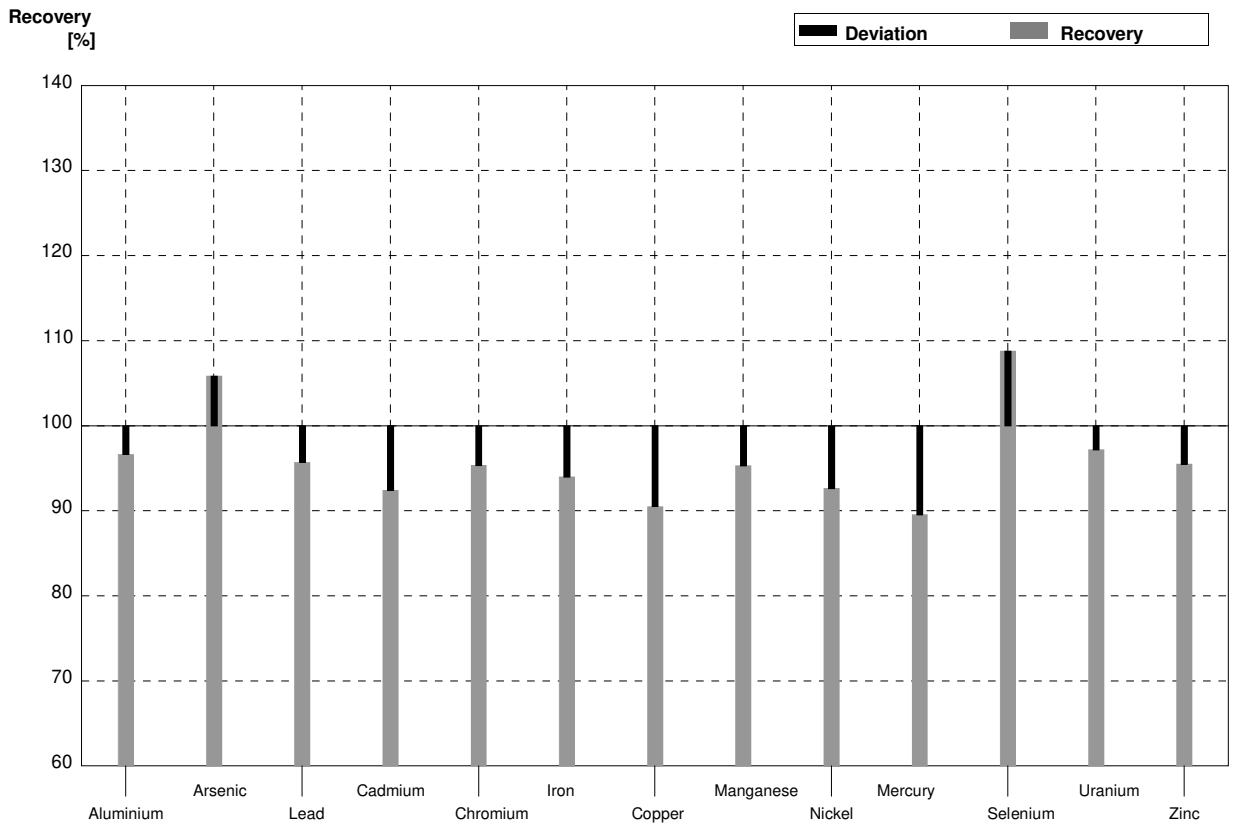
**Sample M176B**  
**Laboratory L**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18			$\mu\text{g/l}$	
Arsenic	1,302	0,013			$\mu\text{g/l}$	
Lead	5,02	0,03			$\mu\text{g/l}$	
Cadmium	1,516	0,012			$\mu\text{g/l}$	
Chromium	0,800	0,011			$\mu\text{g/l}$	
Iron	68,8	0,3			$\mu\text{g/l}$	
Copper	4,07	0,03			$\mu\text{g/l}$	
Manganese	26,27	0,15			$\mu\text{g/l}$	
Nickel	4,16	0,04			$\mu\text{g/l}$	
Mercury	0,856	0,014			$\mu\text{g/l}$	
Selenium	1,61	0,02	1,345	0,16	$\mu\text{g/l}$	84%
Uranium	1,713	0,015			$\mu\text{g/l}$	
Zinc	81	4			$\mu\text{g/l}$	



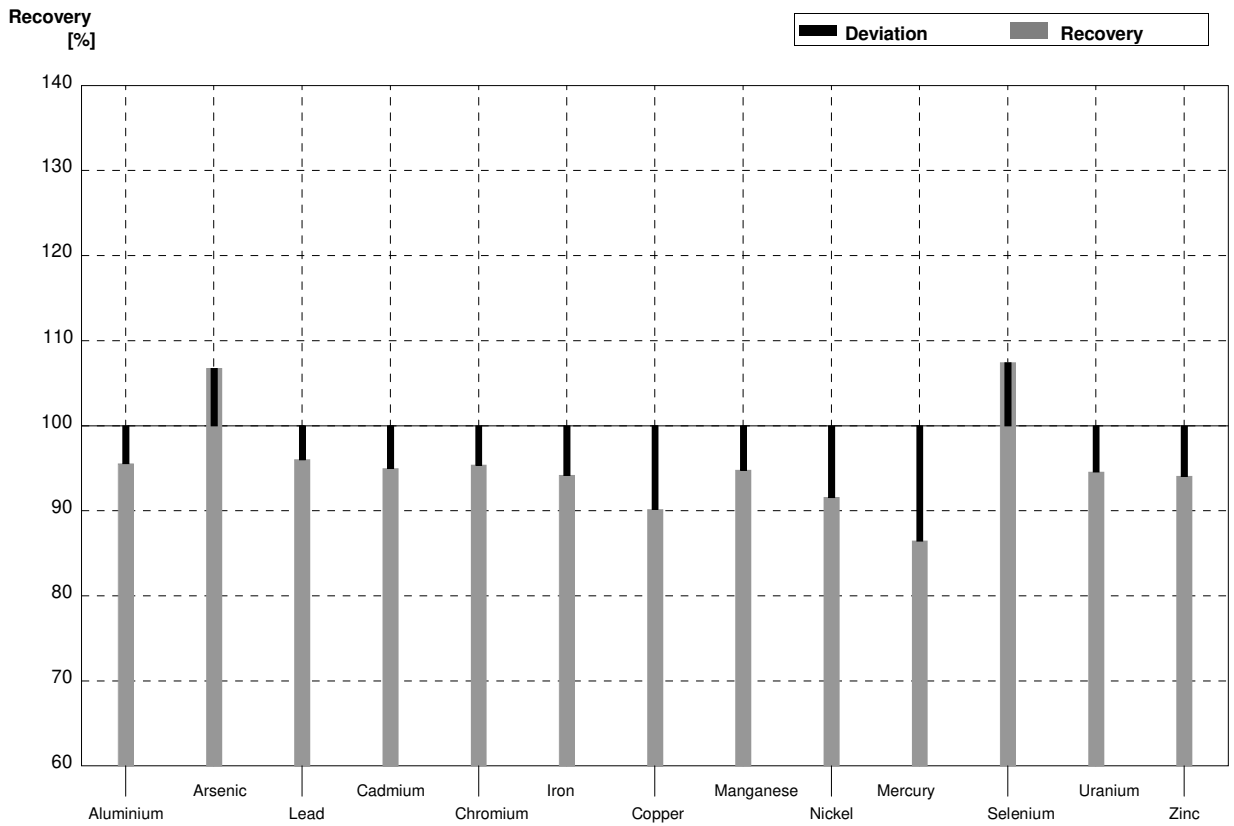
**Sample M176A**  
**Laboratory M**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	31,7	7,9	$\mu\text{g/l}$	97%
Arsenic	2,031	0,017	2,15	0,54	$\mu\text{g/l}$	106%
Lead	3,03	0,03	2,90	0,73	$\mu\text{g/l}$	96%
Cadmium	0,303	0,003	0,280	0,07	$\mu\text{g/l}$	92%
Chromium	3,65	0,03	3,48	0,87	$\mu\text{g/l}$	95%
Iron	18,3	0,2	17,2	4,3	$\mu\text{g/l}$	94%
Copper	7,91	0,10	7,16	1,79	$\mu\text{g/l}$	91%
Manganese	34,31	0,17	32,7	8,2	$\mu\text{g/l}$	95%
Nickel	5,57	0,05	5,16	1,29	$\mu\text{g/l}$	93%
Mercury	1,597	0,017	1,43	0,43	$\mu\text{g/l}$	90%
Selenium	0,91	0,02	0,99	0,25	$\mu\text{g/l}$	109%
Uranium	0,499	0,006	0,485	0,121	$\mu\text{g/l}$	97%
Zinc	20,0	3,6	19,1	4,8	$\mu\text{g/l}$	96%



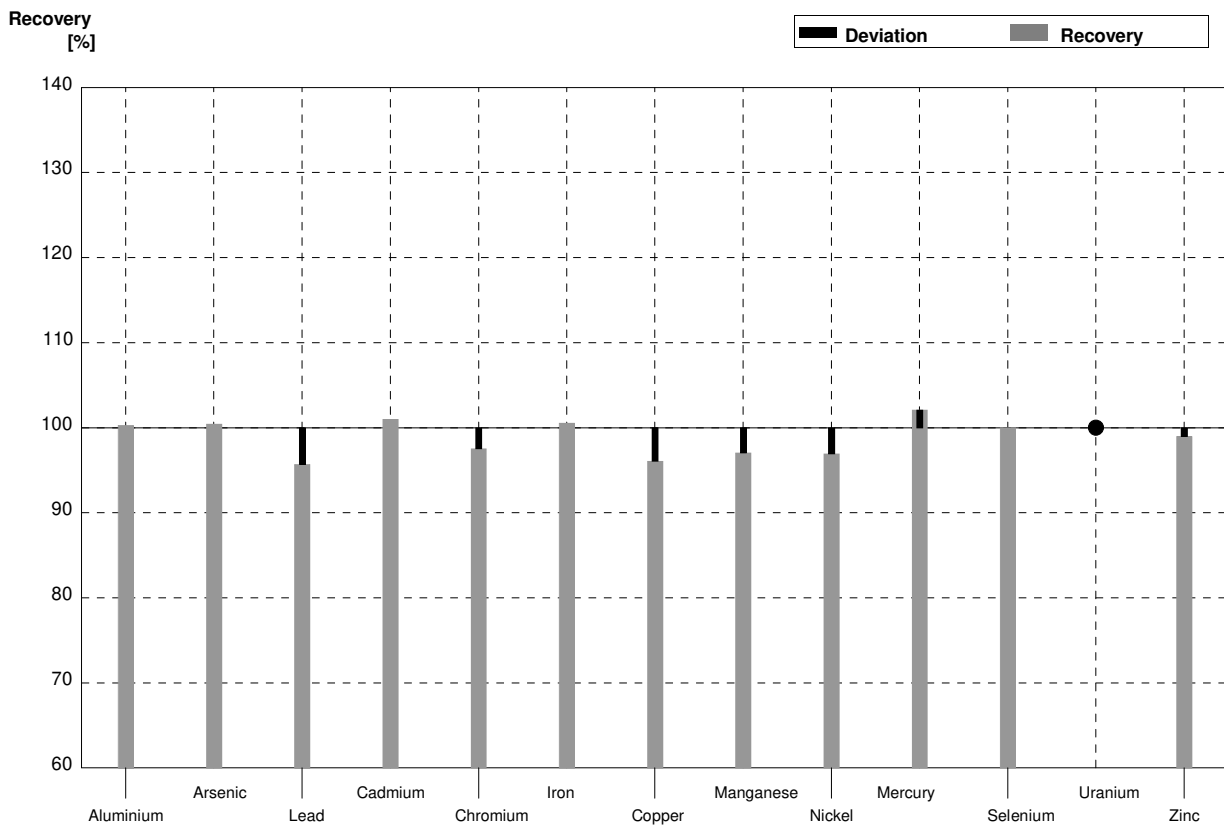
**Sample M176B**  
**Laboratory M**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	14,4	3,6	$\mu\text{g/l}$	96%
Arsenic	1,302	0,013	1,39	0,35	$\mu\text{g/l}$	107%
Lead	5,02	0,03	4,82	1,21	$\mu\text{g/l}$	96%
Cadmium	1,516	0,012	1,44	0,36	$\mu\text{g/l}$	95%
Chromium	0,800	0,011	0,763	0,191	$\mu\text{g/l}$	95%
Iron	68,8	0,3	64,8	16,2	$\mu\text{g/l}$	94%
Copper	4,07	0,03	3,67	0,92	$\mu\text{g/l}$	90%
Manganese	26,27	0,15	24,9	6,2	$\mu\text{g/l}$	95%
Nickel	4,16	0,04	3,81	0,95	$\mu\text{g/l}$	92%
Mercury	0,856	0,014	0,74	0,22	$\mu\text{g/l}$	86%
Selenium	1,61	0,02	1,73	0,43	$\mu\text{g/l}$	107%
Uranium	1,713	0,015	1,62	0,40	$\mu\text{g/l}$	95%
Zinc	81	4	76,2	19,1	$\mu\text{g/l}$	94%



**Sample M176A**  
**Laboratory N**

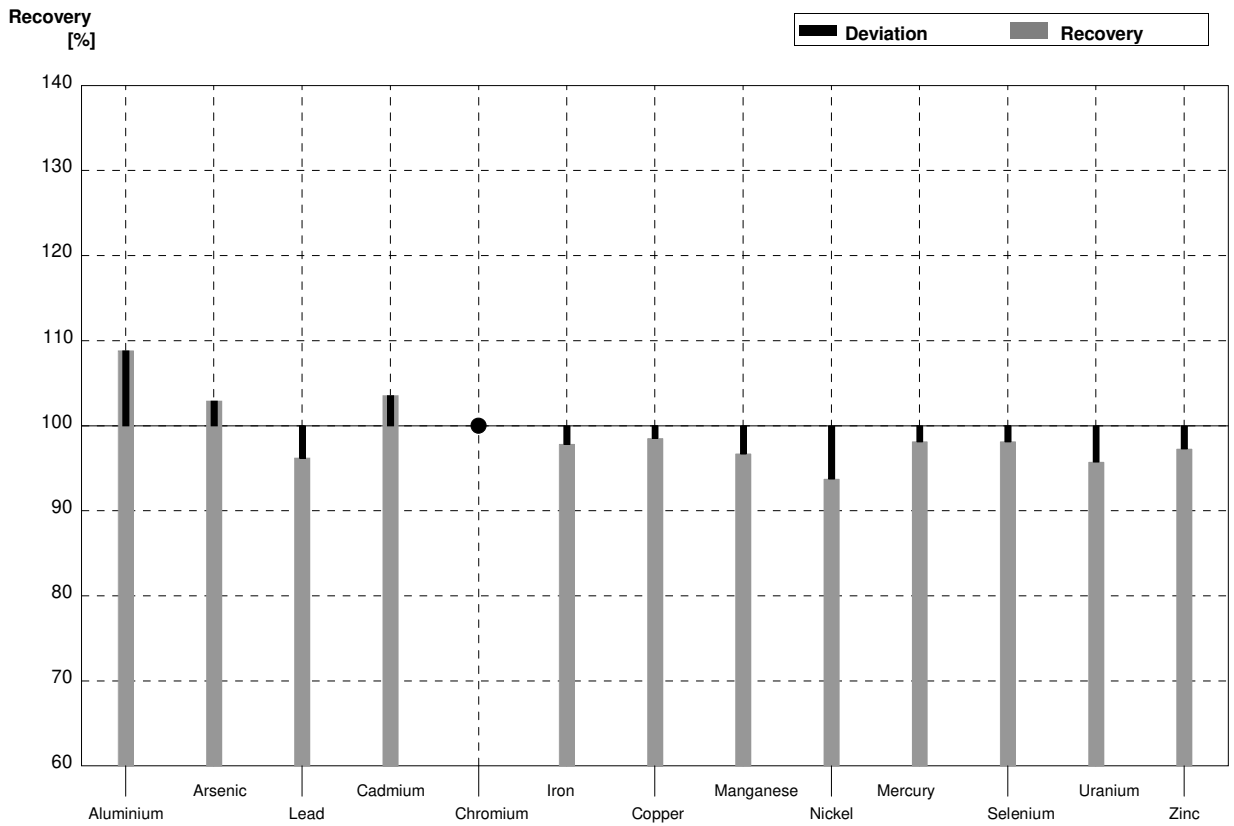
Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	32,9	4,4	$\mu\text{g/l}$	100%
Arsenic	2,031	0,017	2,04	0,36	$\mu\text{g/l}$	100%
Lead	3,03	0,03	2,90	0,28	$\mu\text{g/l}$	96%
Cadmium	0,303	0,003	0,306	0,064	$\mu\text{g/l}$	101%
Chromium	3,65	0,03	3,56	0,38	$\mu\text{g/l}$	98%
Iron	18,3	0,2	18,4	1,9	$\mu\text{g/l}$	101%
Copper	7,91	0,10	7,6	0,7	$\mu\text{g/l}$	96%
Manganese	34,31	0,17	33,3	1,7	$\mu\text{g/l}$	97%
Nickel	5,57	0,05	5,4	0,5	$\mu\text{g/l}$	97%
Mercury	1,597	0,017	1,63	0,28	$\mu\text{g/l}$	102%
Selenium	0,91	0,02	0,91	0,29	$\mu\text{g/l}$	100%
Uranium	0,499	0,006	<1		$\mu\text{g/l}$	•
Zinc	20,0	3,6	19,8	2,6	$\mu\text{g/l}$	99%





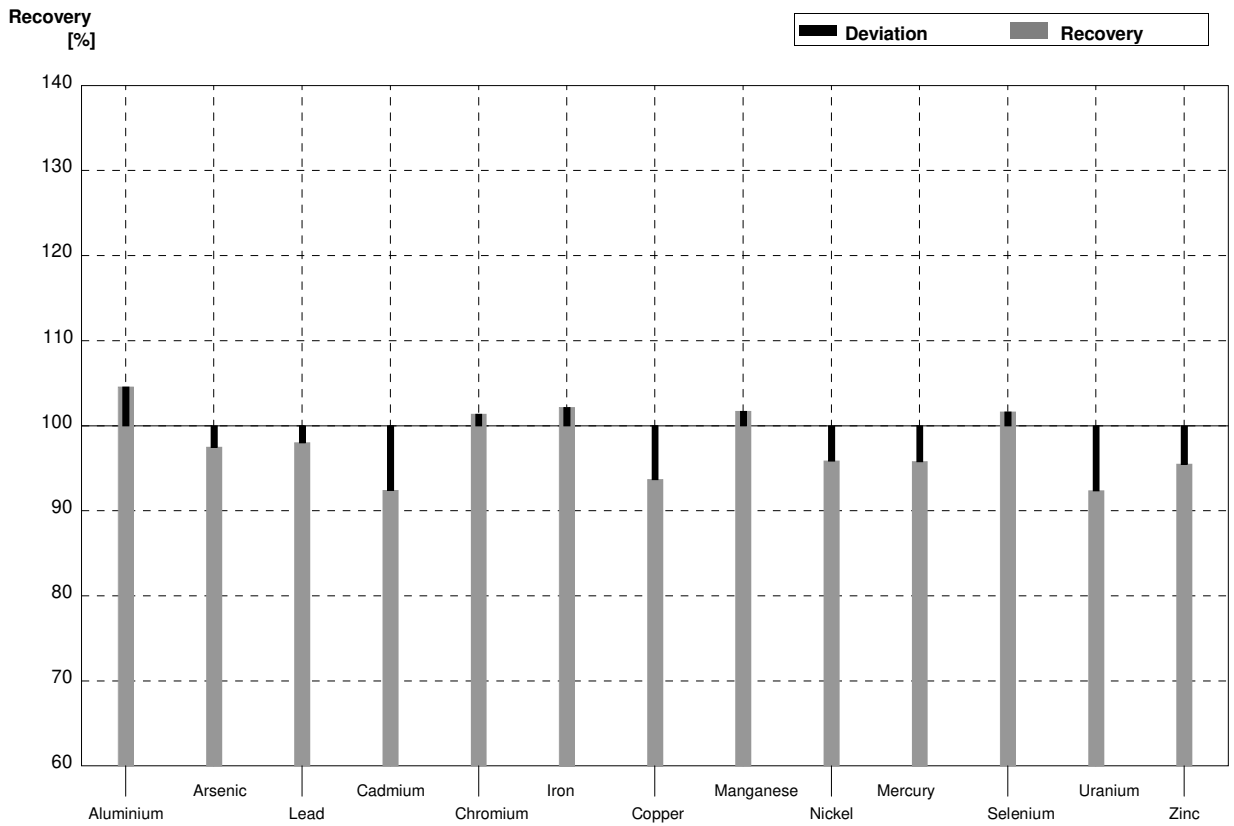
**Sample M176B**  
**Laboratory N**

Parameter	Assigned value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,07	0,18	16,4	2,6	µg/l	109%
Arsenic	1,302	0,013	1,34	0,32	µg/l	103%
Lead	5,02	0,03	4,83	0,44	µg/l	96%
Cadmium	1,516	0,012	1,57	0,16	µg/l	104%
Chromium	0,800	0,011	<1		µg/l	•
Iron	68,8	0,3	67,3	5,9	µg/l	98%
Copper	4,07	0,03	4,01	0,48	µg/l	99%
Manganese	26,27	0,15	25,4	1,4	µg/l	97%
Nickel	4,16	0,04	3,90	0,45	µg/l	94%
Mercury	0,856	0,014	0,84	0,15	µg/l	98%
Selenium	1,61	0,02	1,58	0,37	µg/l	98%
Uranium	1,713	0,015	1,64	0,20	µg/l	96%
Zinc	81	4	78,8	9,1	µg/l	97%



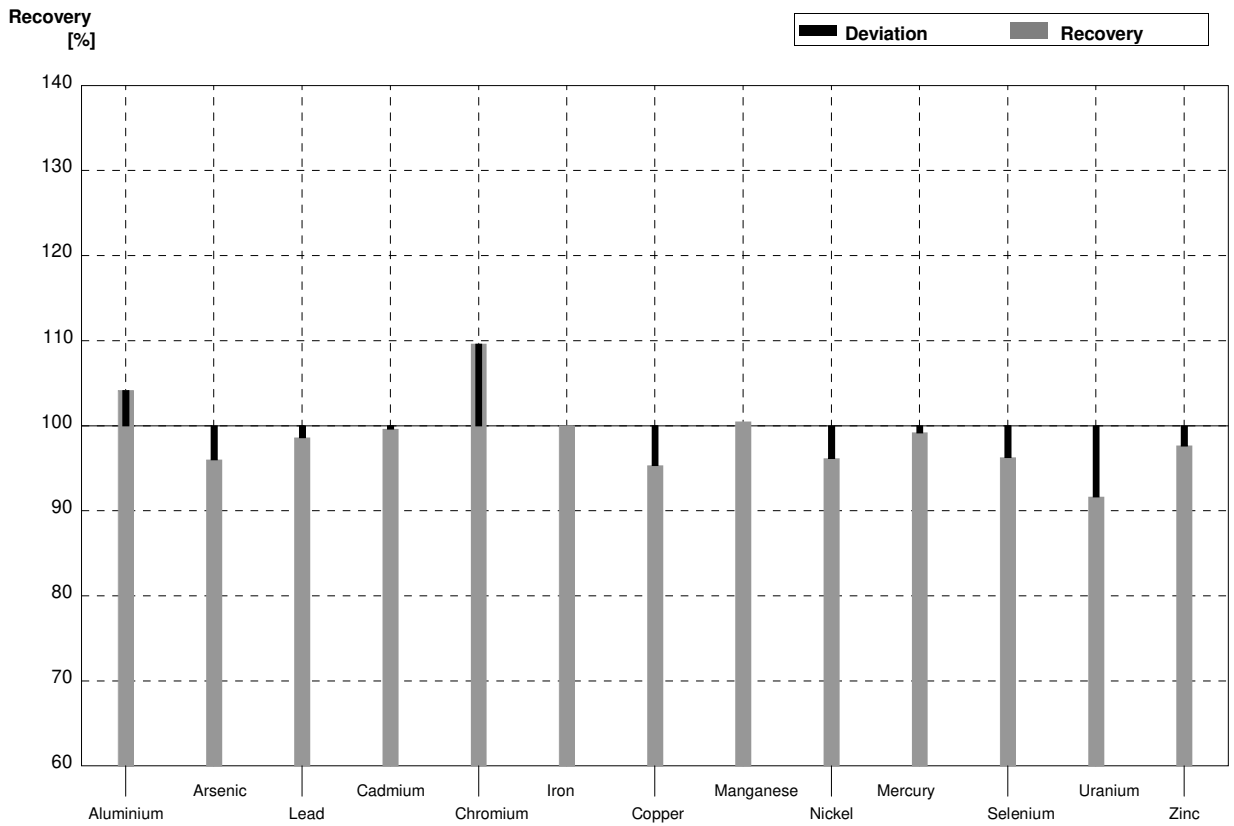
**Sample M176A**  
**Laboratory O**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	34,3	0,52	$\mu\text{g/l}$	105%
Arsenic	2,031	0,017	1,98	0,081	$\mu\text{g/l}$	97%
Lead	3,03	0,03	2,97	0,015	$\mu\text{g/l}$	98%
Cadmium	0,303	0,003	0,280	0,020	$\mu\text{g/l}$	92%
Chromium	3,65	0,03	3,70	0,18	$\mu\text{g/l}$	101%
Iron	18,3	0,2	18,7	0,72	$\mu\text{g/l}$	102%
Copper	7,91	0,10	7,41	0,080	$\mu\text{g/l}$	94%
Manganese	34,31	0,17	34,9	0,50	$\mu\text{g/l}$	102%
Nickel	5,57	0,05	5,34	0,11	$\mu\text{g/l}$	96%
Mercury	1,597	0,017	1,53	0,017	$\mu\text{g/l}$	96%
Selenium	0,91	0,02	0,925	0,025	$\mu\text{g/l}$	102%
Uranium	0,499	0,006	0,461	0,008	$\mu\text{g/l}$	92%
Zinc	20,0	3,6	19,1	0,21	$\mu\text{g/l}$	96%



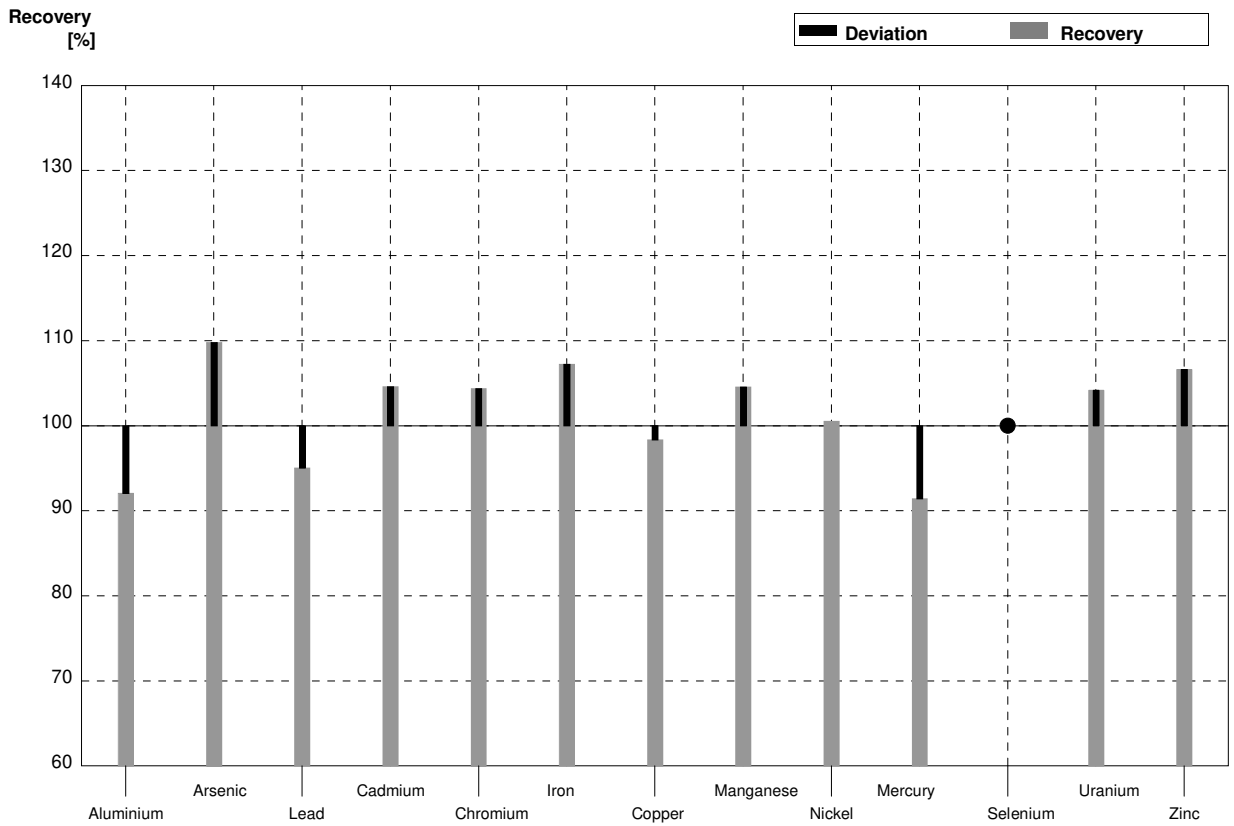
**Sample M176B**  
**Laboratory O**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	15,7	0,25	$\mu\text{g/l}$	104%
Arsenic	1,302	0,013	1,25	0,043	$\mu\text{g/l}$	96%
Lead	5,02	0,03	4,95	0,026	$\mu\text{g/l}$	99%
Cadmium	1,516	0,012	1,51	0,074	$\mu\text{g/l}$	100%
Chromium	0,800	0,011	0,877	0,056	$\mu\text{g/l}$	110%
Iron	68,8	0,3	68,8	2,1	$\mu\text{g/l}$	100%
Copper	4,07	0,03	3,88	0,040	$\mu\text{g/l}$	95%
Manganese	26,27	0,15	26,4	0,40	$\mu\text{g/l}$	100%
Nickel	4,16	0,04	4,00	0,095	$\mu\text{g/l}$	96%
Mercury	0,856	0,014	0,849	0,008	$\mu\text{g/l}$	99%
Selenium	1,61	0,02	1,55	0,040	$\mu\text{g/l}$	96%
Uranium	1,713	0,015	1,57	0,021	$\mu\text{g/l}$	92%
Zinc	81	4	79,1	0,59	$\mu\text{g/l}$	98%



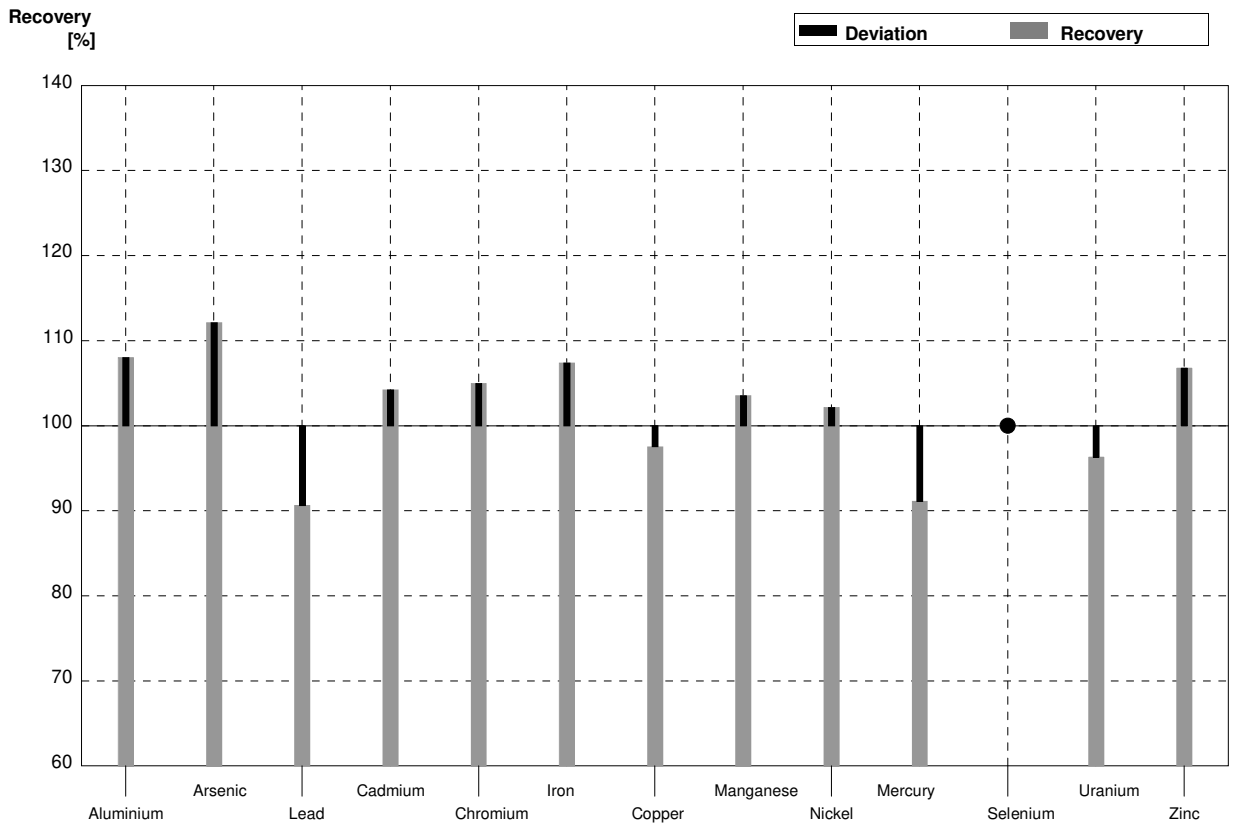
**Sample M176A**  
**Laboratory P**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	30,2	5,4	$\mu\text{g/l}$	92%
Arsenic	2,031	0,017	2,23	0,36	$\mu\text{g/l}$	110%
Lead	3,03	0,03	2,88	0,43	$\mu\text{g/l}$	95%
Cadmium	0,303	0,003	0,317	0,038	$\mu\text{g/l}$	105%
Chromium	3,65	0,03	3,81	0,53	$\mu\text{g/l}$	104%
Iron	18,3	0,2	19,63	2,75	$\mu\text{g/l}$	107%
Copper	7,91	0,10	7,78	1,32	$\mu\text{g/l}$	98%
Manganese	34,31	0,17	35,88	3,95	$\mu\text{g/l}$	105%
Nickel	5,57	0,05	5,60	0,90	$\mu\text{g/l}$	101%
Mercury	1,597	0,017	1,46	0,32	$\mu\text{g/l}$	91%
Selenium	0,91	0,02	<2,0		$\mu\text{g/l}$	•
Uranium	0,499	0,006	0,52	0,06	$\mu\text{g/l}$	104%
Zinc	20,0	3,6	21,33	3,41	$\mu\text{g/l}$	107%



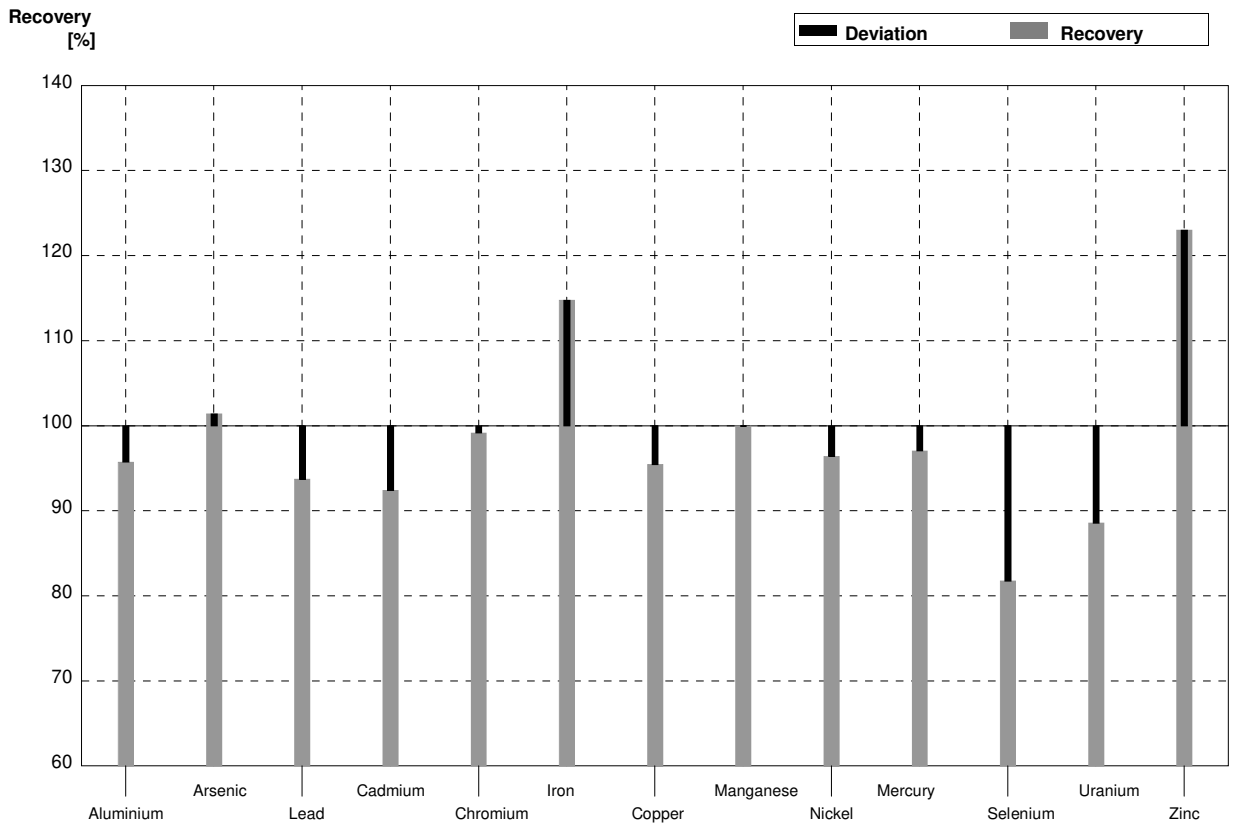
**Sample M176B**  
**Laboratory P**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	16,28	2,93	$\mu\text{g/l}$	108%
Arsenic	1,302	0,013	1,46	0,23	$\mu\text{g/l}$	112%
Lead	5,02	0,03	4,55	0,68	$\mu\text{g/l}$	91%
Cadmium	1,516	0,012	1,58	0,19	$\mu\text{g/l}$	104%
Chromium	0,800	0,011	0,84	0,12	$\mu\text{g/l}$	105%
Iron	68,8	0,3	73,88	10,34	$\mu\text{g/l}$	107%
Copper	4,07	0,03	3,97	0,67	$\mu\text{g/l}$	98%
Manganese	26,27	0,15	27,2	3,0	$\mu\text{g/l}$	104%
Nickel	4,16	0,04	4,25	0,68	$\mu\text{g/l}$	102%
Mercury	0,856	0,014	0,78	0,17	$\mu\text{g/l}$	91%
Selenium	1,61	0,02	<5,0		$\mu\text{g/l}$	•
Uranium	1,713	0,015	1,65	0,20	$\mu\text{g/l}$	96%
Zinc	81	4	86,50	13,84	$\mu\text{g/l}$	107%



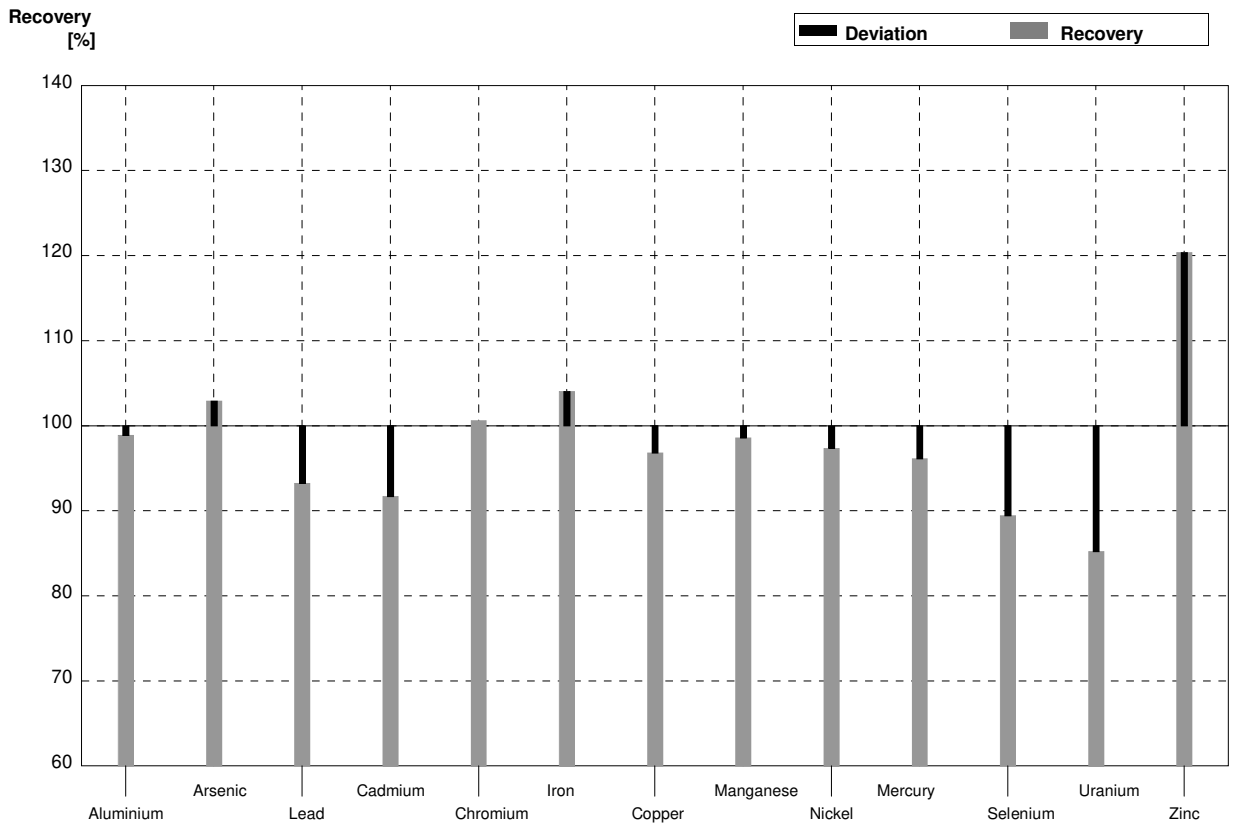
**Sample M176A**  
**Laboratory Q**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	31,4	6,0	$\mu\text{g/l}$	96%
Arsenic	2,031	0,017	2,06	0,09	$\mu\text{g/l}$	101%
Lead	3,03	0,03	2,84	0,10	$\mu\text{g/l}$	94%
Cadmium	0,303	0,003	0,280	0,048	$\mu\text{g/l}$	92%
Chromium	3,65	0,03	3,62	0,62	$\mu\text{g/l}$	99%
Iron	18,3	0,2	21,0	3,4	$\mu\text{g/l}$	115%
Copper	7,91	0,10	7,55	0,57	$\mu\text{g/l}$	95%
Manganese	34,31	0,17	34,3	5,5	$\mu\text{g/l}$	100%
Nickel	5,57	0,05	5,37	0,35	$\mu\text{g/l}$	96%
Mercury	1,597	0,017	1,55	0,47	$\mu\text{g/l}$	97%
Selenium	0,91	0,02	0,744	0,208	$\mu\text{g/l}$	82%
Uranium	0,499	0,006	0,442	0,075	$\mu\text{g/l}$	89%
Zinc	20,0	3,6	24,6	4,4	$\mu\text{g/l}$	123%



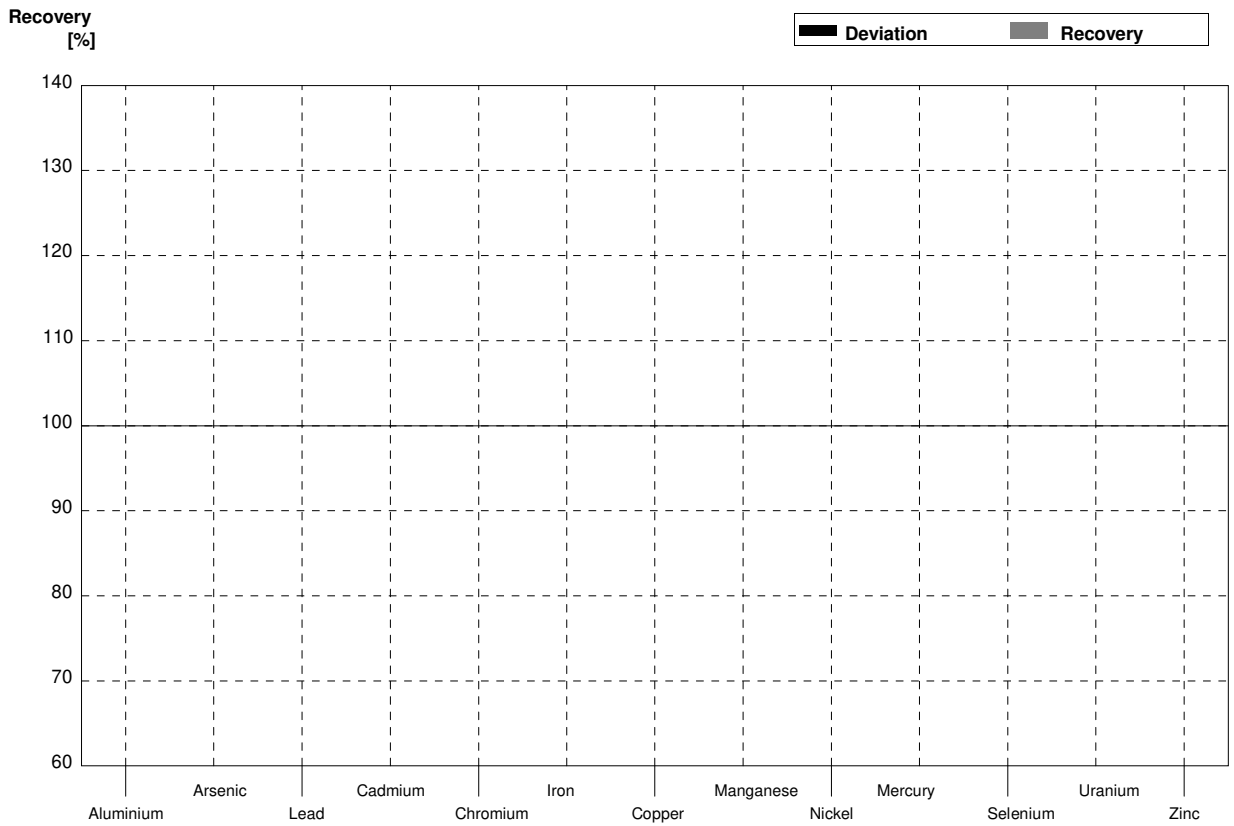
**Sample M176B**  
**Laboratory Q**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	14,9	2,8	$\mu\text{g/l}$	99%
Arsenic	1,302	0,013	1,34	0,06	$\mu\text{g/l}$	103%
Lead	5,02	0,03	4,68	0,16	$\mu\text{g/l}$	93%
Cadmium	1,516	0,012	1,39	0,24	$\mu\text{g/l}$	92%
Chromium	0,800	0,011	0,805	0,137	$\mu\text{g/l}$	101%
Iron	68,8	0,3	71,6	11,5	$\mu\text{g/l}$	104%
Copper	4,07	0,03	3,94	0,30	$\mu\text{g/l}$	97%
Manganese	26,27	0,15	25,9	4,1	$\mu\text{g/l}$	99%
Nickel	4,16	0,04	4,05	0,26	$\mu\text{g/l}$	97%
Mercury	0,856	0,014	0,823	0,247	$\mu\text{g/l}$	96%
Selenium	1,61	0,02	1,44	0,40	$\mu\text{g/l}$	89%
Uranium	1,713	0,015	1,46	0,25	$\mu\text{g/l}$	85%
Zinc	81	4	97,5	17,6	$\mu\text{g/l}$	120%



**Sample M176A**  
**Laboratory R**

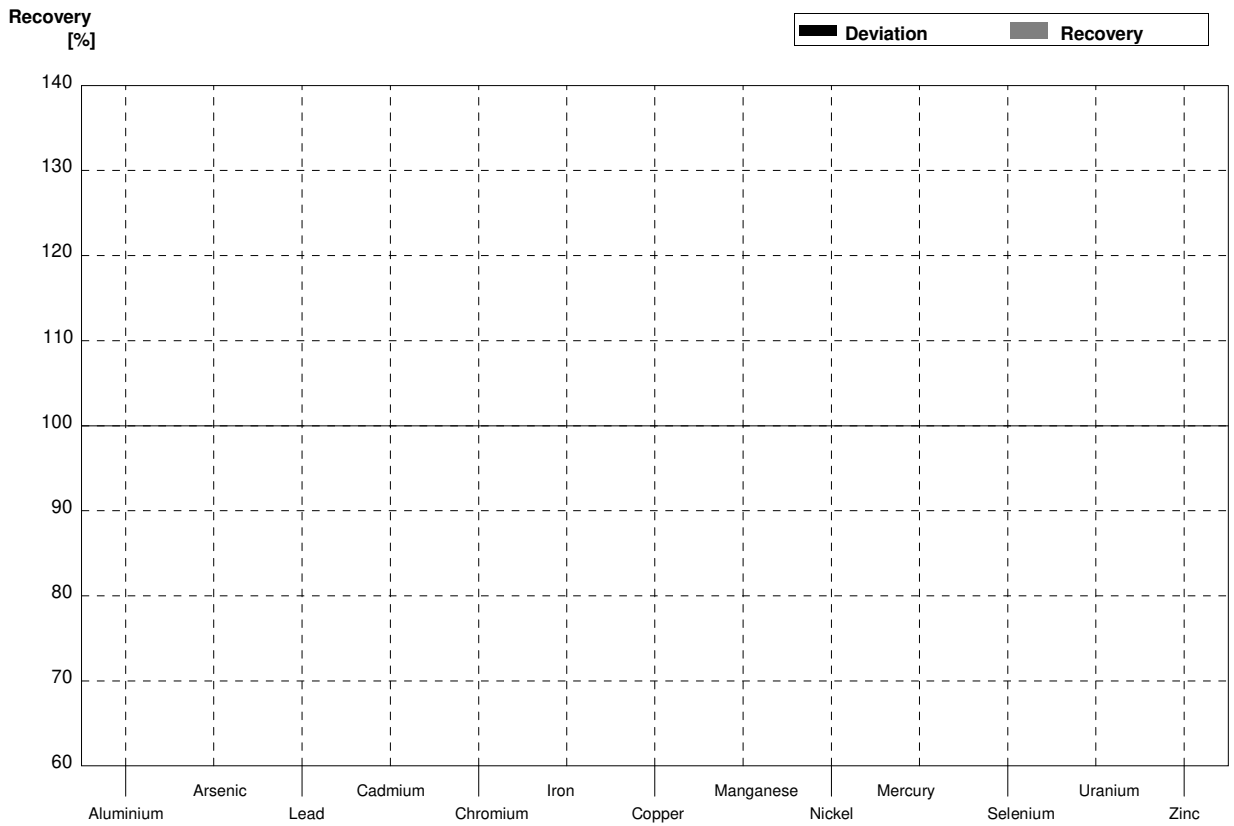
Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3			$\mu\text{g/l}$	
Arsenic	2,031	0,017			$\mu\text{g/l}$	
Lead	3,03	0,03			$\mu\text{g/l}$	
Cadmium	0,303	0,003			$\mu\text{g/l}$	
Chromium	3,65	0,03			$\mu\text{g/l}$	
Iron	18,3	0,2			$\mu\text{g/l}$	
Copper	7,91	0,10			$\mu\text{g/l}$	
Manganese	34,31	0,17			$\mu\text{g/l}$	
Nickel	5,57	0,05			$\mu\text{g/l}$	
Mercury	1,597	0,017			$\mu\text{g/l}$	
Selenium	0,91	0,02			$\mu\text{g/l}$	
Uranium	0,499	0,006			$\mu\text{g/l}$	
Zinc	20,0	3,6			$\mu\text{g/l}$	





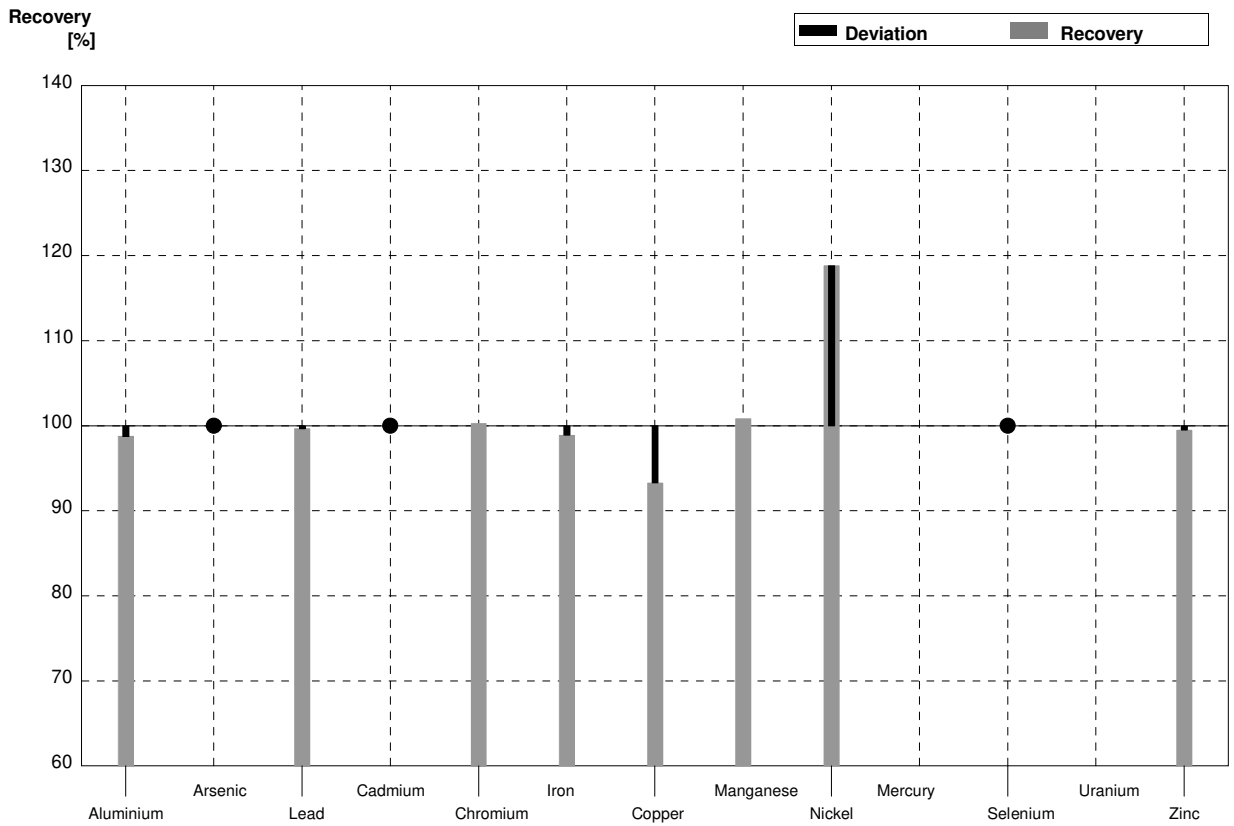
**Sample M176B**  
**Laboratory R**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18			$\mu\text{g/l}$	
Arsenic	1,302	0,013			$\mu\text{g/l}$	
Lead	5,02	0,03			$\mu\text{g/l}$	
Cadmium	1,516	0,012			$\mu\text{g/l}$	
Chromium	0,800	0,011			$\mu\text{g/l}$	
Iron	68,8	0,3			$\mu\text{g/l}$	
Copper	4,07	0,03			$\mu\text{g/l}$	
Manganese	26,27	0,15			$\mu\text{g/l}$	
Nickel	4,16	0,04			$\mu\text{g/l}$	
Mercury	0,856	0,014			$\mu\text{g/l}$	
Selenium	1,61	0,02			$\mu\text{g/l}$	
Uranium	1,713	0,015			$\mu\text{g/l}$	
Zinc	81	4			$\mu\text{g/l}$	



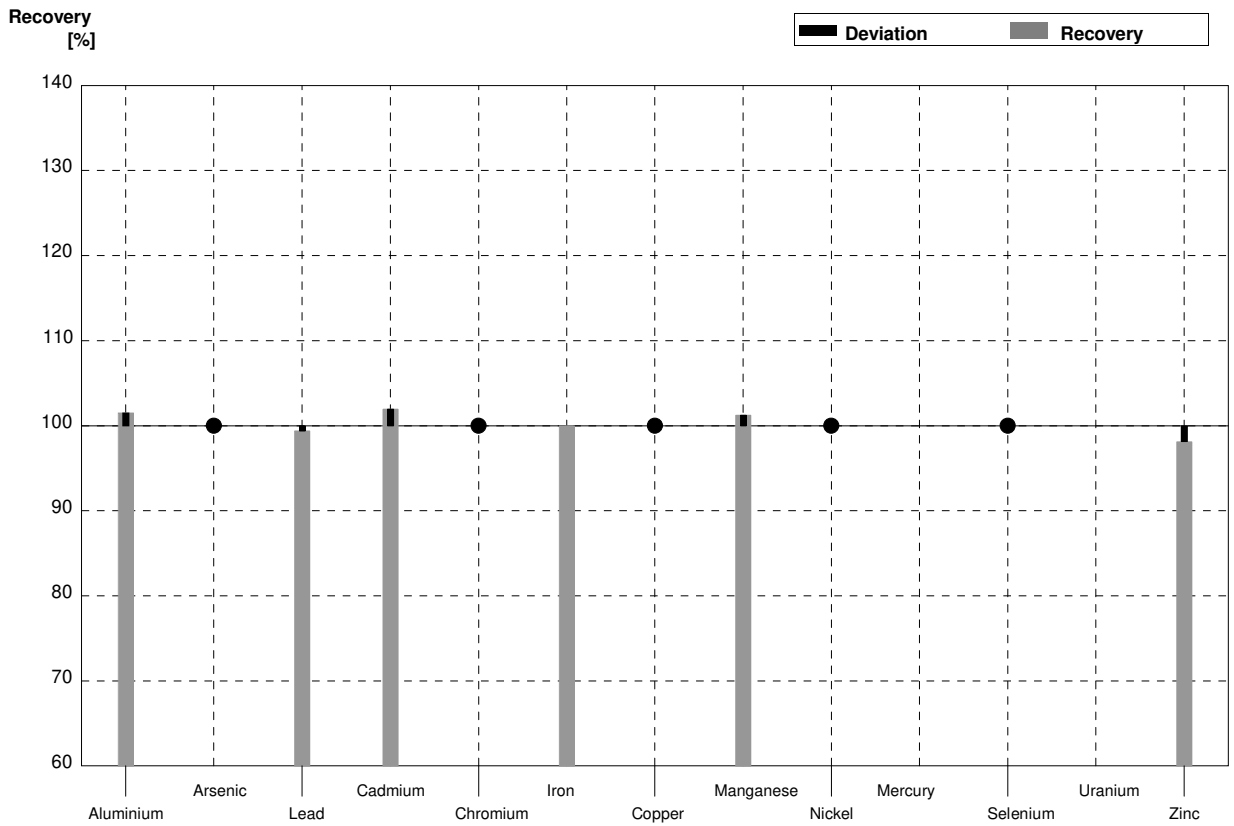
**Sample M176A**  
**Laboratory S**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	32,4	5,0	$\mu\text{g/l}$	99%
Arsenic	2,031	0,017	<5,0		$\mu\text{g/l}$	•
Lead	3,03	0,03	3,02	0,52	$\mu\text{g/l}$	100%
Cadmium	0,303	0,003	<1,0		$\mu\text{g/l}$	•
Chromium	3,65	0,03	3,66	0,30	$\mu\text{g/l}$	100%
Iron	18,3	0,2	18,1	1,5	$\mu\text{g/l}$	99%
Copper	7,91	0,10	7,38	2,66	$\mu\text{g/l}$	93%
Manganese	34,31	0,17	34,6	3,3	$\mu\text{g/l}$	101%
Nickel	5,57	0,05	6,62	0,81	$\mu\text{g/l}$	119%
Mercury	1,597	0,017			$\mu\text{g/l}$	
Selenium	0,91	0,02	<10		$\mu\text{g/l}$	•
Uranium	0,499	0,006			$\mu\text{g/l}$	
Zinc	20,0	3,6	19,9	2,8	$\mu\text{g/l}$	100%



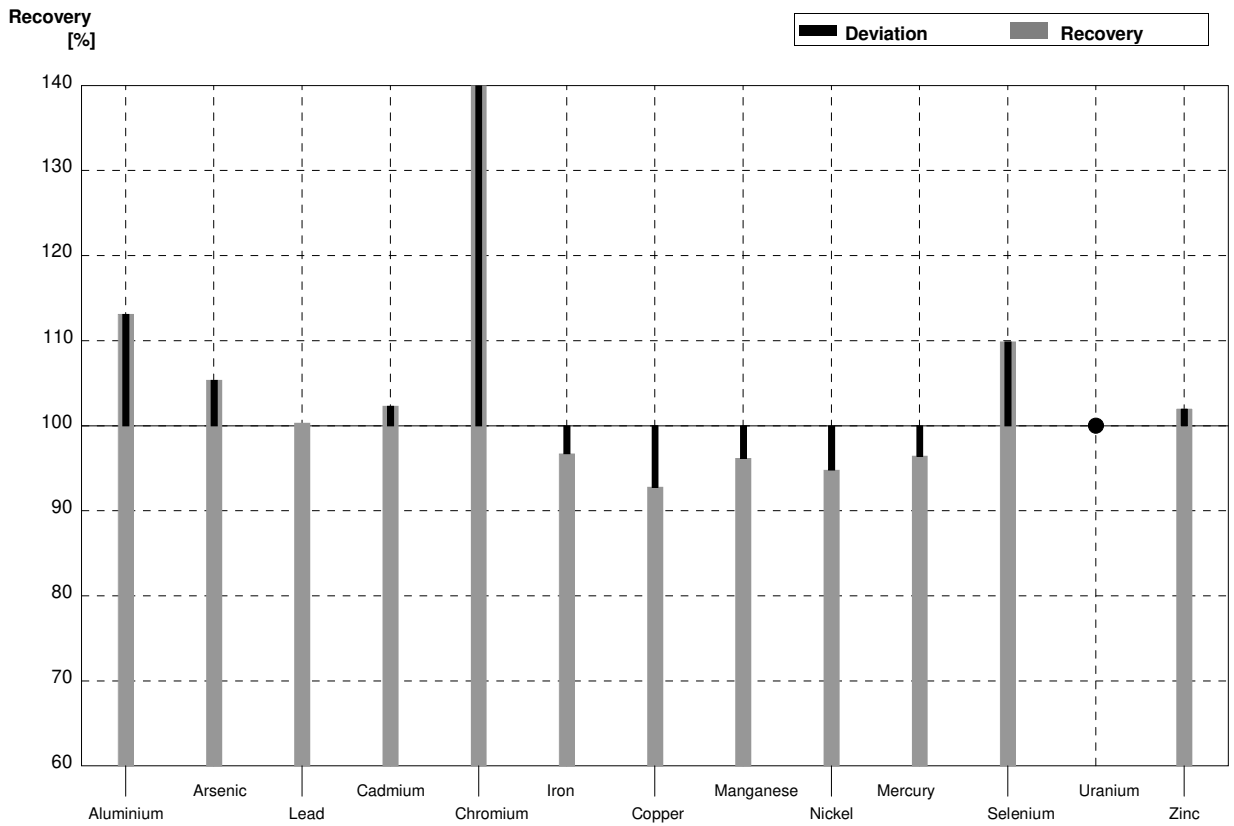
**Sample M176B**  
**Laboratory S**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	15,3	2,4	$\mu\text{g/l}$	102%
Arsenic	1,302	0,013	<5,0		$\mu\text{g/l}$	•
Lead	5,02	0,03	4,99	0,85	$\mu\text{g/l}$	99%
Cadmium	1,516	0,012	1,546	0,110	$\mu\text{g/l}$	102%
Chromium	0,800	0,011	<2,0		$\mu\text{g/l}$	•
Iron	68,8	0,3	68,8	5,8	$\mu\text{g/l}$	100%
Copper	4,07	0,03	<5		$\mu\text{g/l}$	•
Manganese	26,27	0,15	26,6	2,5	$\mu\text{g/l}$	101%
Nickel	4,16	0,04	<5,0		$\mu\text{g/l}$	•
Mercury	0,856	0,014			$\mu\text{g/l}$	
Selenium	1,61	0,02	<10		$\mu\text{g/l}$	•
Uranium	1,713	0,015			$\mu\text{g/l}$	
Zinc	81	4	79,5	11,1	$\mu\text{g/l}$	98%



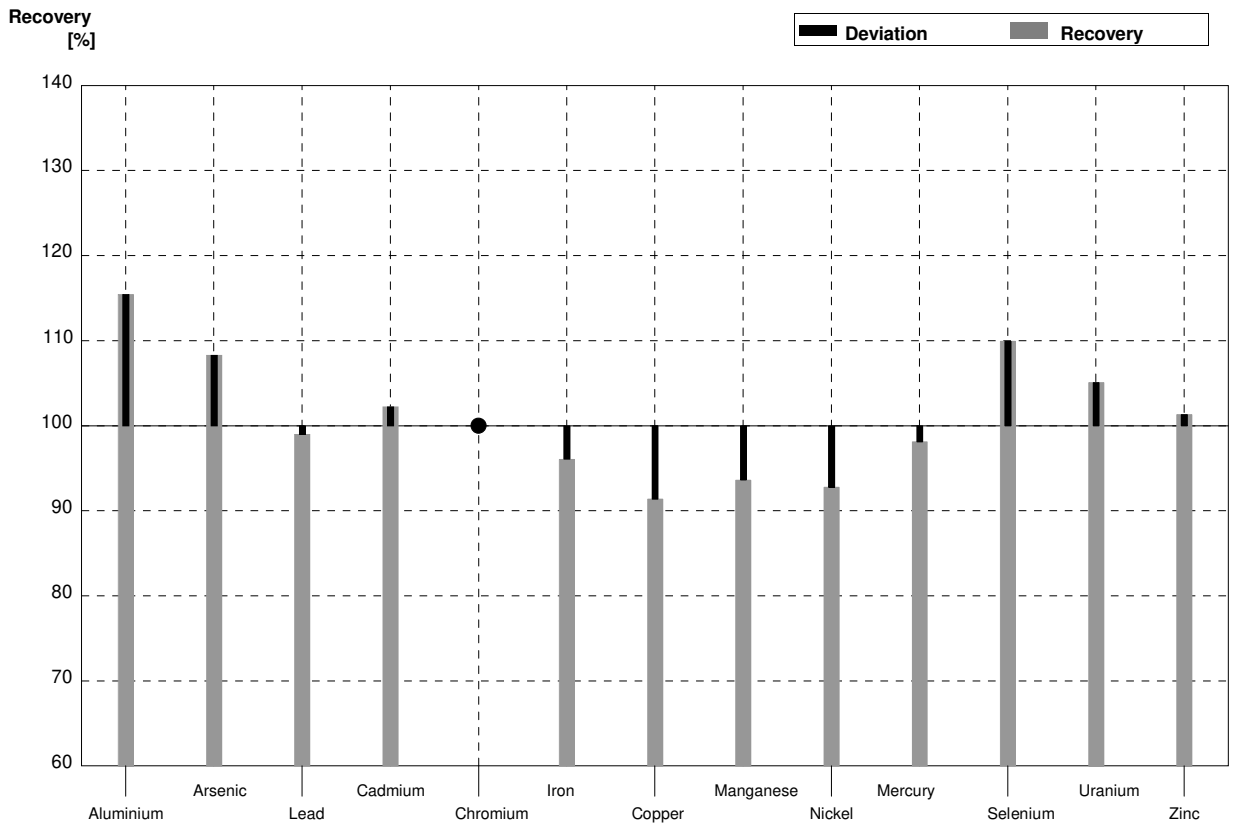
**Sample M176A**  
**Laboratory T**

Parameter	Assigned value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	32,8	0,3	37,1	3,7	µg/l	113%
Arsenic	2,031	0,017	2,14	0,315	µg/l	105%
Lead	3,03	0,03	3,04	0,304	µg/l	100%
Cadmium	0,303	0,003	0,310	0,031	µg/l	102%
Chromium	3,65	0,03	34,7	3,47	µg/l	951%
Iron	18,3	0,2	17,7	1,77	µg/l	97%
Copper	7,91	0,10	7,34	0,734	µg/l	93%
Manganese	34,31	0,17	33,0	3,3	µg/l	96%
Nickel	5,57	0,05	5,28	0,53	µg/l	95%
Mercury	1,597	0,017	1,54	0,15	µg/l	96%
Selenium	0,91	0,02	1,00	0,15	µg/l	110%
Uranium	0,499	0,006	<1		µg/l	•
Zinc	20,0	3,6	20,4	2,04	µg/l	102%



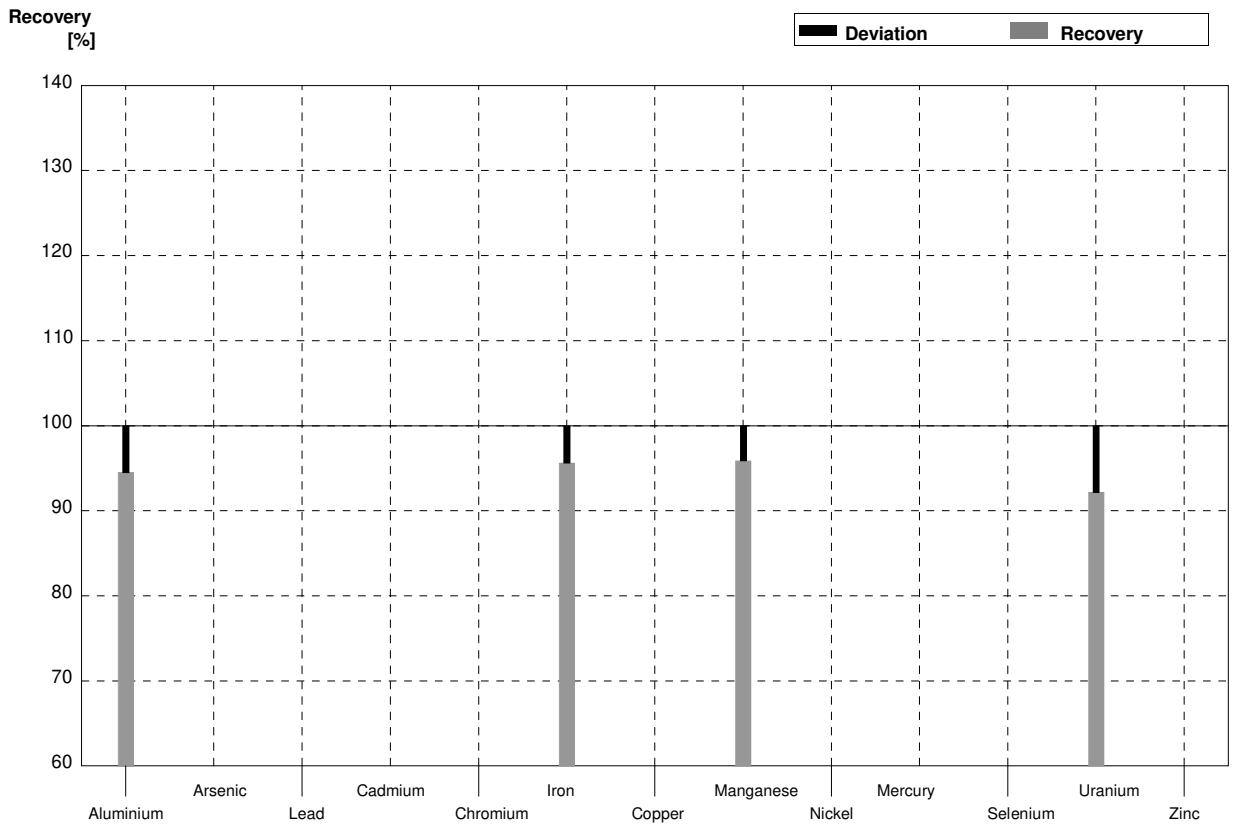
**Sample M176B**  
**Laboratory T**

Parameter	Assigned value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,07	0,18	17,4	1,7	µg/l	115%
Arsenic	1,302	0,013	1,41	0,21	µg/l	108%
Lead	5,02	0,03	4,97	0,497	µg/l	99%
Cadmium	1,516	0,012	1,55	0,155	µg/l	102%
Chromium	0,800	0,011	<1		µg/l	•
Iron	68,8	0,3	66,1	6,61	µg/l	96%
Copper	4,07	0,03	3,72	0,37	µg/l	91%
Manganese	26,27	0,15	24,6	2,46	µg/l	94%
Nickel	4,16	0,04	3,86	0,386	µg/l	93%
Mercury	0,856	0,014	0,84	0,084	µg/l	98%
Selenium	1,61	0,02	1,77	0,27	µg/l	110%
Uranium	1,713	0,015	1,80	0,18	µg/l	105%
Zinc	81	4	82,1	8,21	µg/l	101%



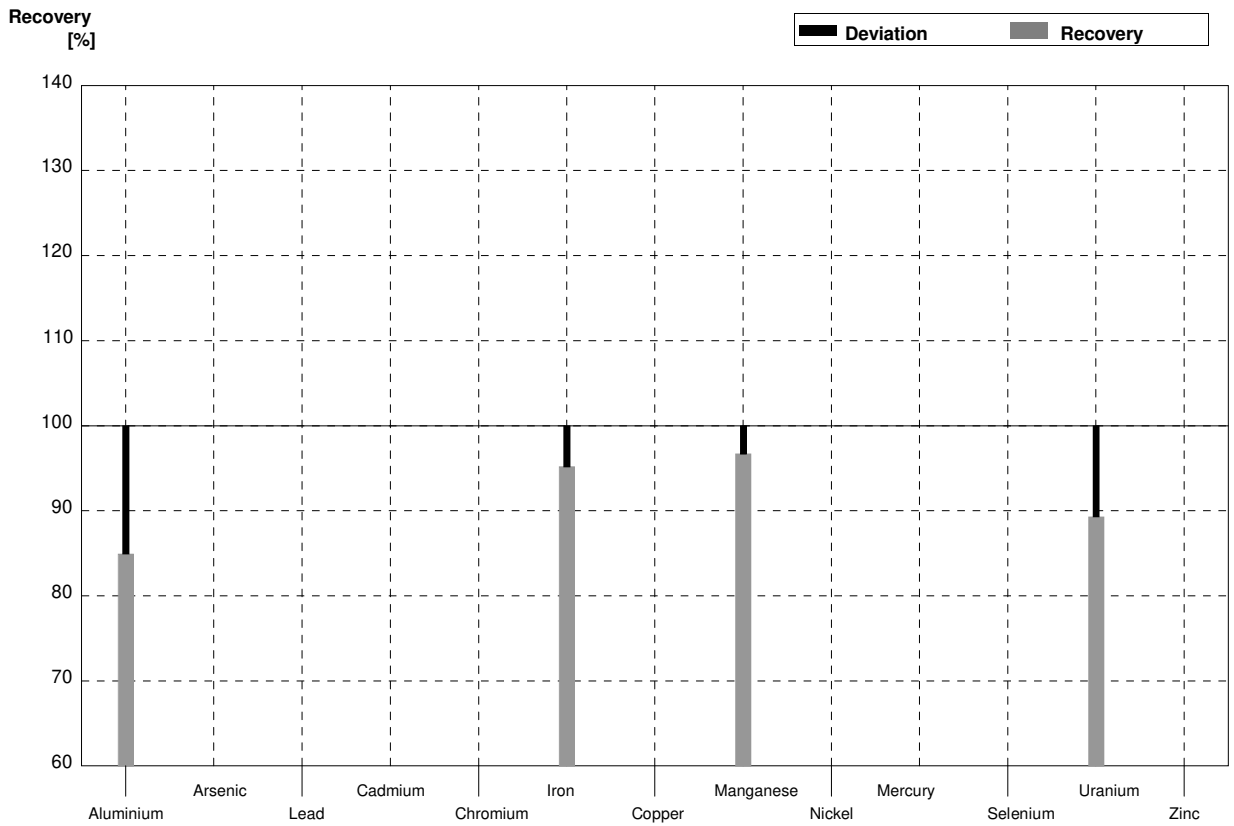
**Sample M176A**  
**Laboratory U**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	31,0		$\mu\text{g/l}$	95%
Arsenic	2,031	0,017			$\mu\text{g/l}$	
Lead	3,03	0,03			$\mu\text{g/l}$	
Cadmium	0,303	0,003			$\mu\text{g/l}$	
Chromium	3,65	0,03			$\mu\text{g/l}$	
Iron	18,3	0,2	17,5		$\mu\text{g/l}$	96%
Copper	7,91	0,10			$\mu\text{g/l}$	
Manganese	34,31	0,17	32,9		$\mu\text{g/l}$	96%
Nickel	5,57	0,05			$\mu\text{g/l}$	
Mercury	1,597	0,017			$\mu\text{g/l}$	
Selenium	0,91	0,02			$\mu\text{g/l}$	
Uranium	0,499	0,006	0,460		$\mu\text{g/l}$	92%
Zinc	20,0	3,6			$\mu\text{g/l}$	



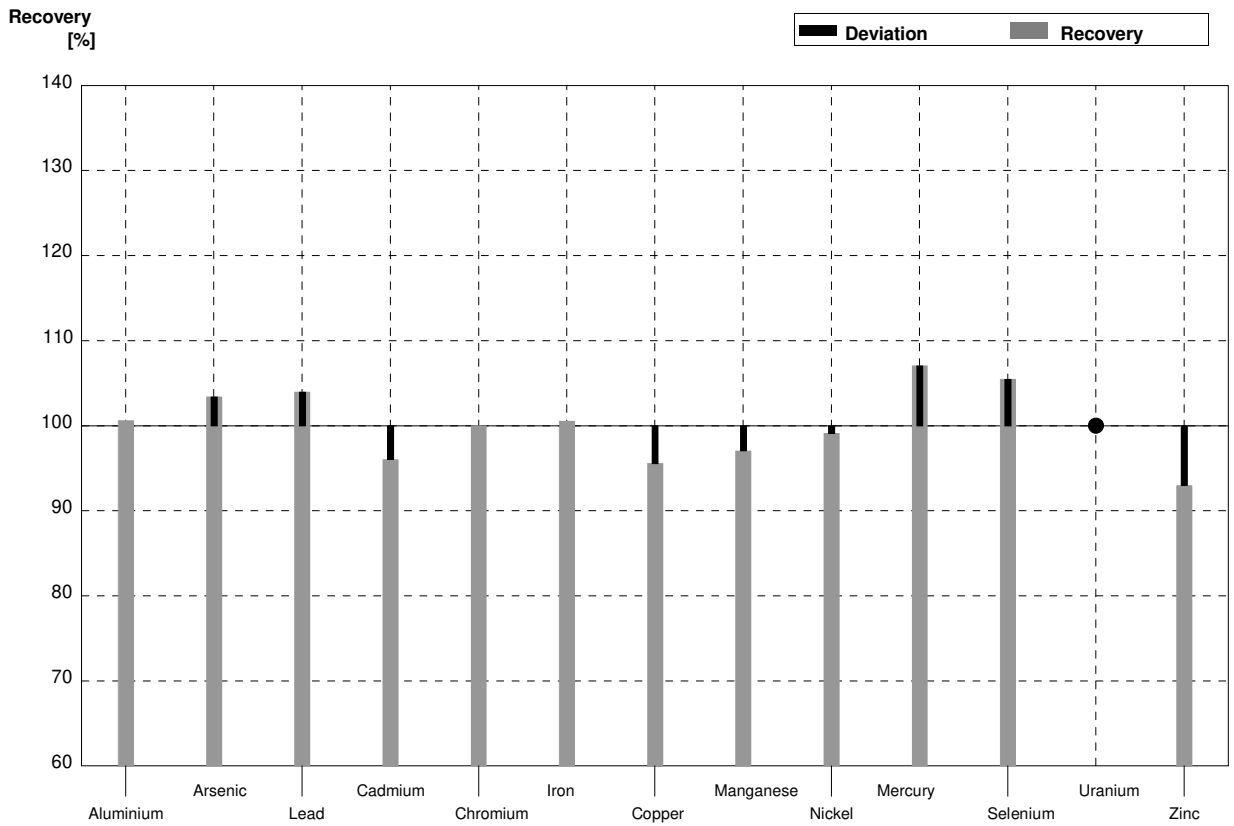
**Sample M176B**  
**Laboratory U**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	12,8		$\mu\text{g/l}$	85%
Arsenic	1,302	0,013			$\mu\text{g/l}$	
Lead	5,02	0,03			$\mu\text{g/l}$	
Cadmium	1,516	0,012			$\mu\text{g/l}$	
Chromium	0,800	0,011			$\mu\text{g/l}$	
Iron	68,8	0,3	65,5		$\mu\text{g/l}$	95%
Copper	4,07	0,03			$\mu\text{g/l}$	
Manganese	26,27	0,15	25,4		$\mu\text{g/l}$	97%
Nickel	4,16	0,04			$\mu\text{g/l}$	
Mercury	0,856	0,014			$\mu\text{g/l}$	
Selenium	1,61	0,02			$\mu\text{g/l}$	
Uranium	1,713	0,015	1,53		$\mu\text{g/l}$	89%
Zinc	81	4			$\mu\text{g/l}$	



**Sample M176A**  
**Laboratory V**

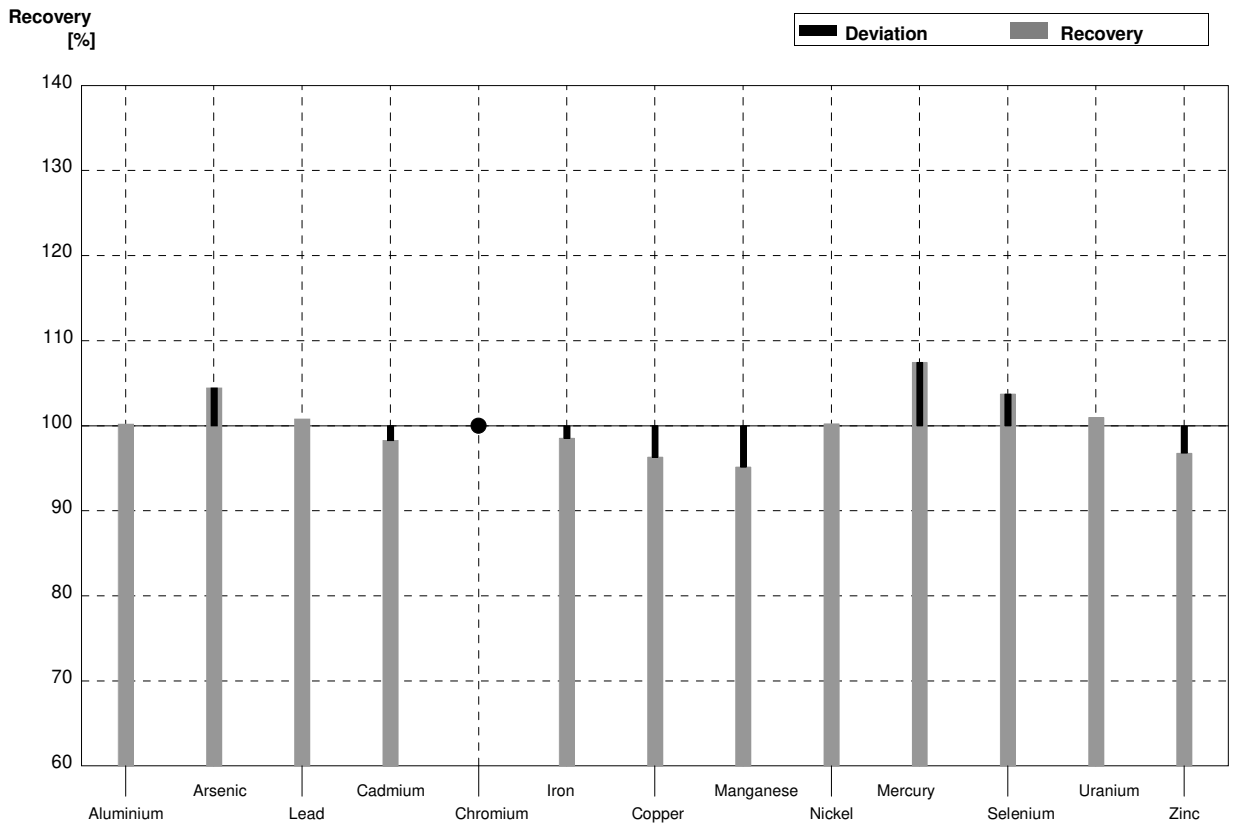
Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	33,0	4,95	$\mu\text{g/l}$	101%
Arsenic	2,031	0,017	2,10	0,32	$\mu\text{g/l}$	103%
Lead	3,03	0,03	3,15	0,47	$\mu\text{g/l}$	104%
Cadmium	0,303	0,003	0,291	0,044	$\mu\text{g/l}$	96%
Chromium	3,65	0,03	3,65	0,55	$\mu\text{g/l}$	100%
Iron	18,3	0,2	18,4	2,76	$\mu\text{g/l}$	101%
Copper	7,91	0,10	7,56	1,13	$\mu\text{g/l}$	96%
Manganese	34,31	0,17	33,3	5,00	$\mu\text{g/l}$	97%
Nickel	5,57	0,05	5,52	0,83	$\mu\text{g/l}$	99%
Mercury	1,597	0,017	1,71	0,26	$\mu\text{g/l}$	107%
Selenium	0,91	0,02	0,96	0,14	$\mu\text{g/l}$	105%
Uranium	0,499	0,006	<1		$\mu\text{g/l}$	•
Zinc	20,0	3,6	18,6	2,79	$\mu\text{g/l}$	93%





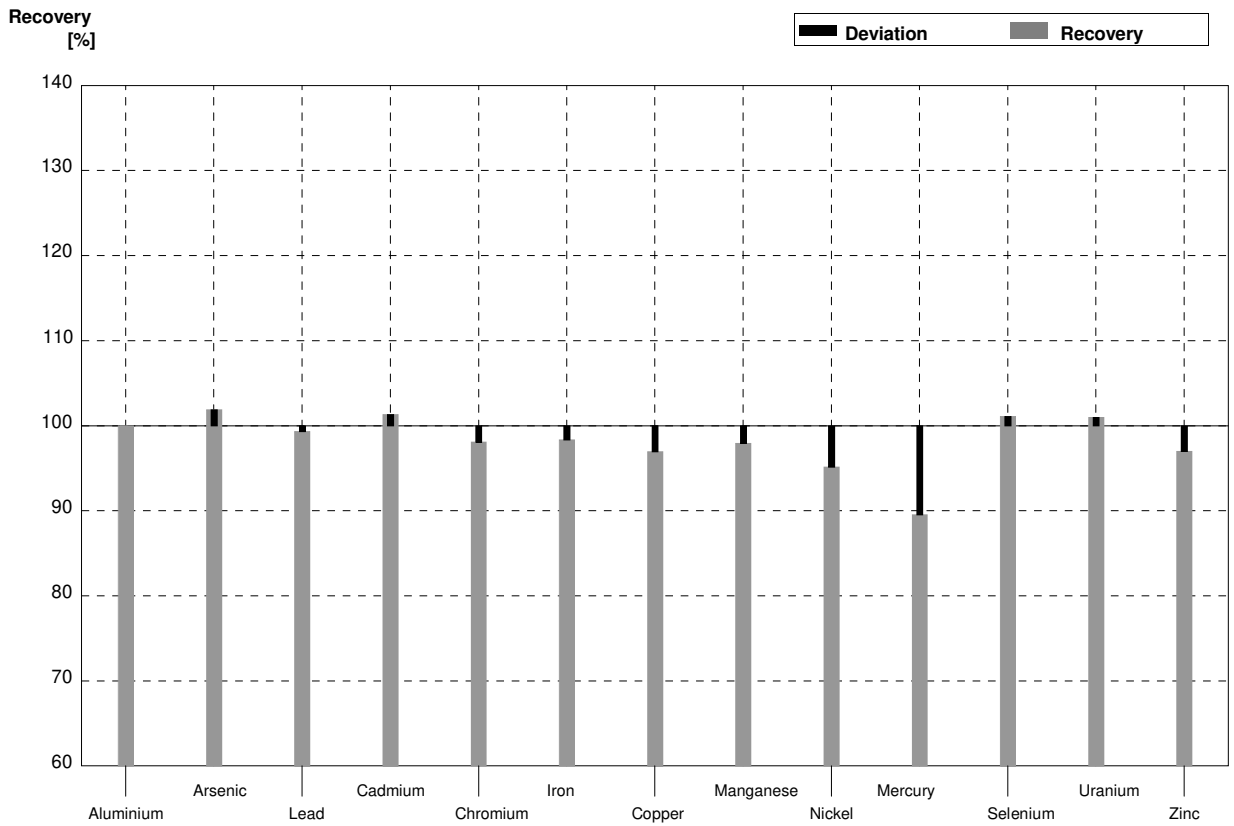
**Sample M176B**  
**Laboratory V**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	15,1	2,27	$\mu\text{g/l}$	100%
Arsenic	1,302	0,013	1,36	0,20	$\mu\text{g/l}$	104%
Lead	5,02	0,03	5,06	0,76	$\mu\text{g/l}$	101%
Cadmium	1,516	0,012	1,49	0,22	$\mu\text{g/l}$	98%
Chromium	0,800	0,011	<1		$\mu\text{g/l}$	•
Iron	68,8	0,3	67,8	10,2	$\mu\text{g/l}$	99%
Copper	4,07	0,03	3,92	0,59	$\mu\text{g/l}$	96%
Manganese	26,27	0,15	25,0	3,75	$\mu\text{g/l}$	95%
Nickel	4,16	0,04	4,17	0,63	$\mu\text{g/l}$	100%
Mercury	0,856	0,014	0,92	0,14	$\mu\text{g/l}$	107%
Selenium	1,61	0,02	1,67	0,25	$\mu\text{g/l}$	104%
Uranium	1,713	0,015	1,73	0,26	$\mu\text{g/l}$	101%
Zinc	81	4	78,4	11,8	$\mu\text{g/l}$	97%



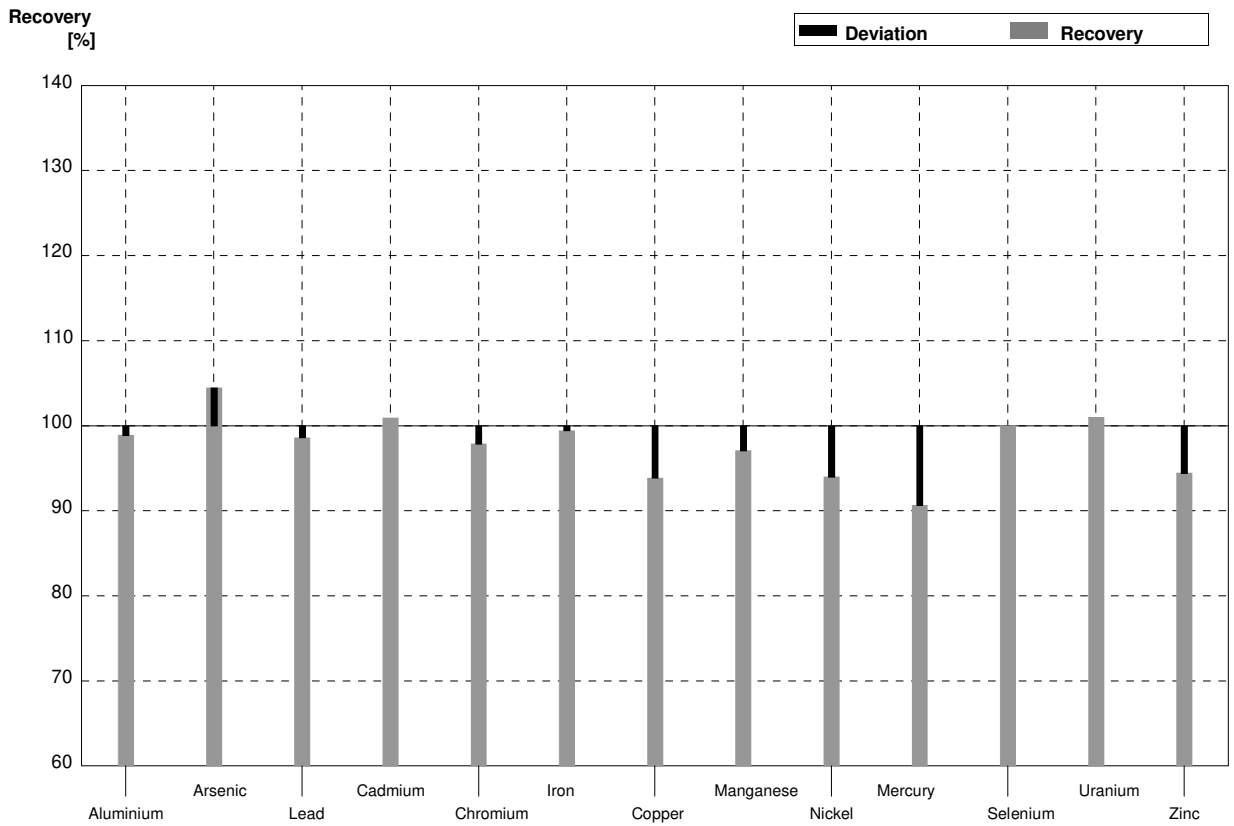
**Sample M176A**  
**Laboratory W**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	32,8	3,9	$\mu\text{g/l}$	100%
Arsenic	2,031	0,017	2,07	0,35	$\mu\text{g/l}$	102%
Lead	3,03	0,03	3,01	0,36	$\mu\text{g/l}$	99%
Cadmium	0,303	0,003	0,307	0,037	$\mu\text{g/l}$	101%
Chromium	3,65	0,03	3,58	0,68	$\mu\text{g/l}$	98%
Iron	18,3	0,2	18,0	5,9	$\mu\text{g/l}$	98%
Copper	7,91	0,10	7,67	0,84	$\mu\text{g/l}$	97%
Manganese	34,31	0,17	33,6	3,7	$\mu\text{g/l}$	98%
Nickel	5,57	0,05	5,30	0,90	$\mu\text{g/l}$	95%
Mercury	1,597	0,017	1,43	0,26	$\mu\text{g/l}$	90%
Selenium	0,91	0,02	0,92	0,31	$\mu\text{g/l}$	101%
Uranium	0,499	0,006	0,504	0,206	$\mu\text{g/l}$	101%
Zinc	20,0	3,6	19,4	3,1	$\mu\text{g/l}$	97%



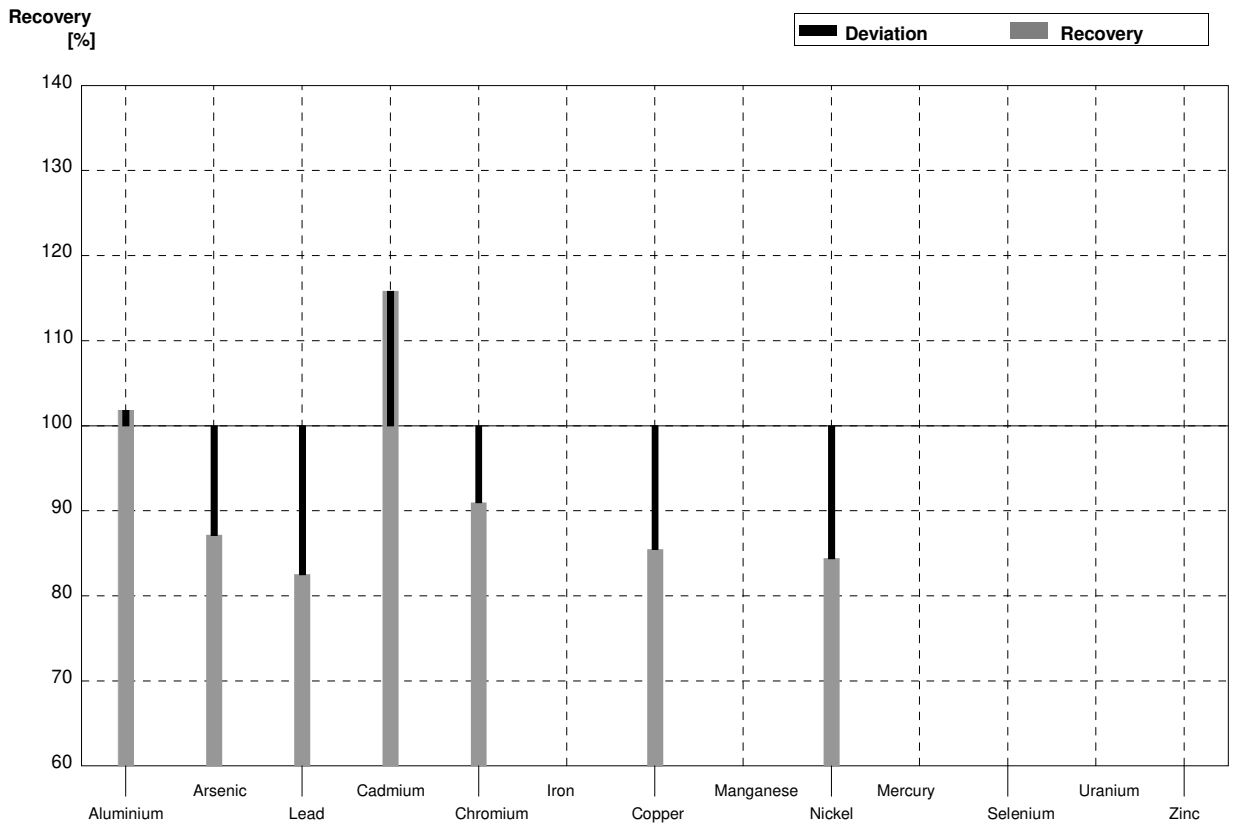
**Sample M176B**  
**Laboratory W**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	14,9	2,5	$\mu\text{g/l}$	99%
Arsenic	1,302	0,013	1,36	0,23	$\mu\text{g/l}$	104%
Lead	5,02	0,03	4,95	0,59	$\mu\text{g/l}$	99%
Cadmium	1,516	0,012	1,53	0,18	$\mu\text{g/l}$	101%
Chromium	0,800	0,011	0,783	0,149	$\mu\text{g/l}$	98%
Iron	68,8	0,3	68,4	12,3	$\mu\text{g/l}$	99%
Copper	4,07	0,03	3,82	0,42	$\mu\text{g/l}$	94%
Manganese	26,27	0,15	25,5	2,8	$\mu\text{g/l}$	97%
Nickel	4,16	0,04	3,91	0,66	$\mu\text{g/l}$	94%
Mercury	0,856	0,014	0,776	0,140	$\mu\text{g/l}$	91%
Selenium	1,61	0,02	1,61	0,55	$\mu\text{g/l}$	100%
Uranium	1,713	0,015	1,73	0,71	$\mu\text{g/l}$	101%
Zinc	81	4	76,5	9,9	$\mu\text{g/l}$	94%



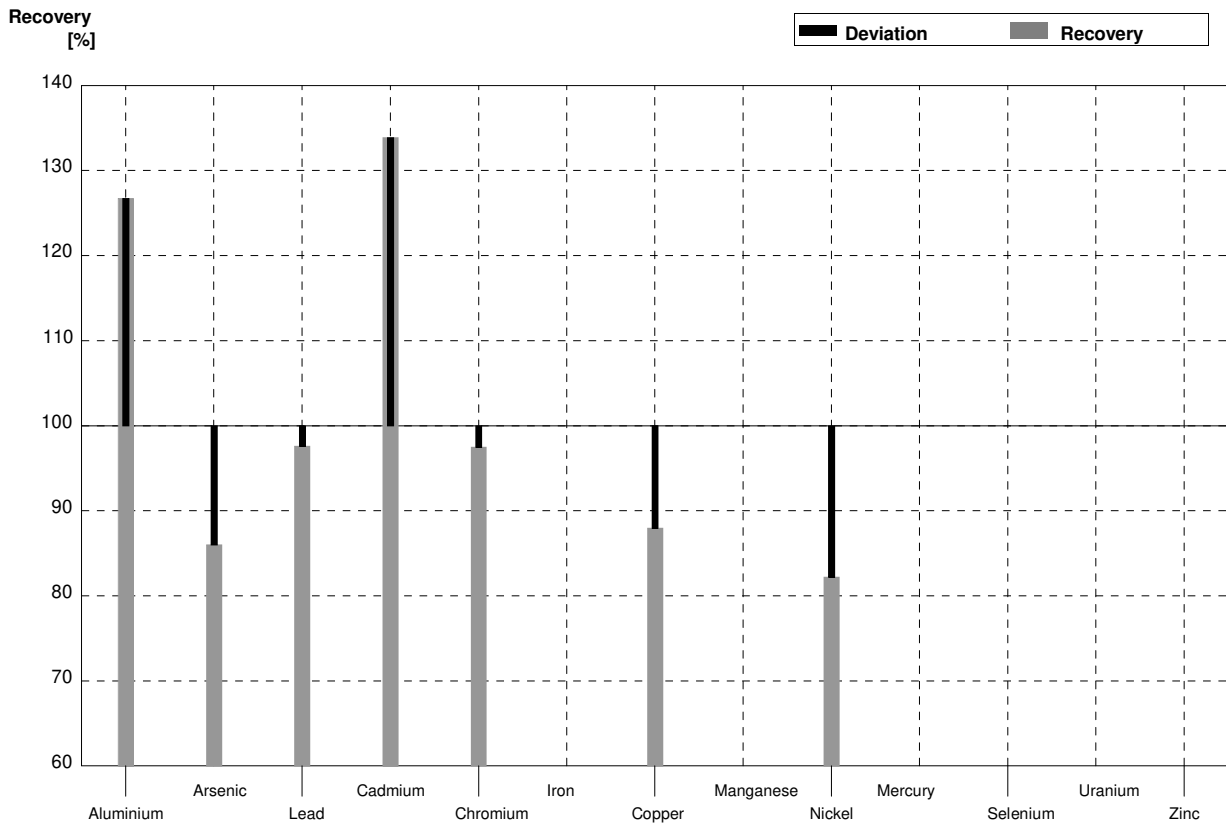
**Sample M176A**  
**Laboratory X**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	33,4	6,7	$\mu\text{g/l}$	102%
Arsenic	2,031	0,017	1,77	0,27	$\mu\text{g/l}$	87%
Lead	3,03	0,03	2,50	0,38	$\mu\text{g/l}$	83%
Cadmium	0,303	0,003	0,351	0,088	$\mu\text{g/l}$	116%
Chromium	3,65	0,03	3,32	0,53	$\mu\text{g/l}$	91%
Iron	18,3	0,2			$\mu\text{g/l}$	
Copper	7,91	0,10	6,76	1,08	$\mu\text{g/l}$	85%
Manganese	34,31	0,17			$\mu\text{g/l}$	
Nickel	5,57	0,05	4,70	0,71	$\mu\text{g/l}$	84%
Mercury	1,597	0,017			$\mu\text{g/l}$	
Selenium	0,91	0,02			$\mu\text{g/l}$	
Uranium	0,499	0,006			$\mu\text{g/l}$	
Zinc	20,0	3,6			$\mu\text{g/l}$	



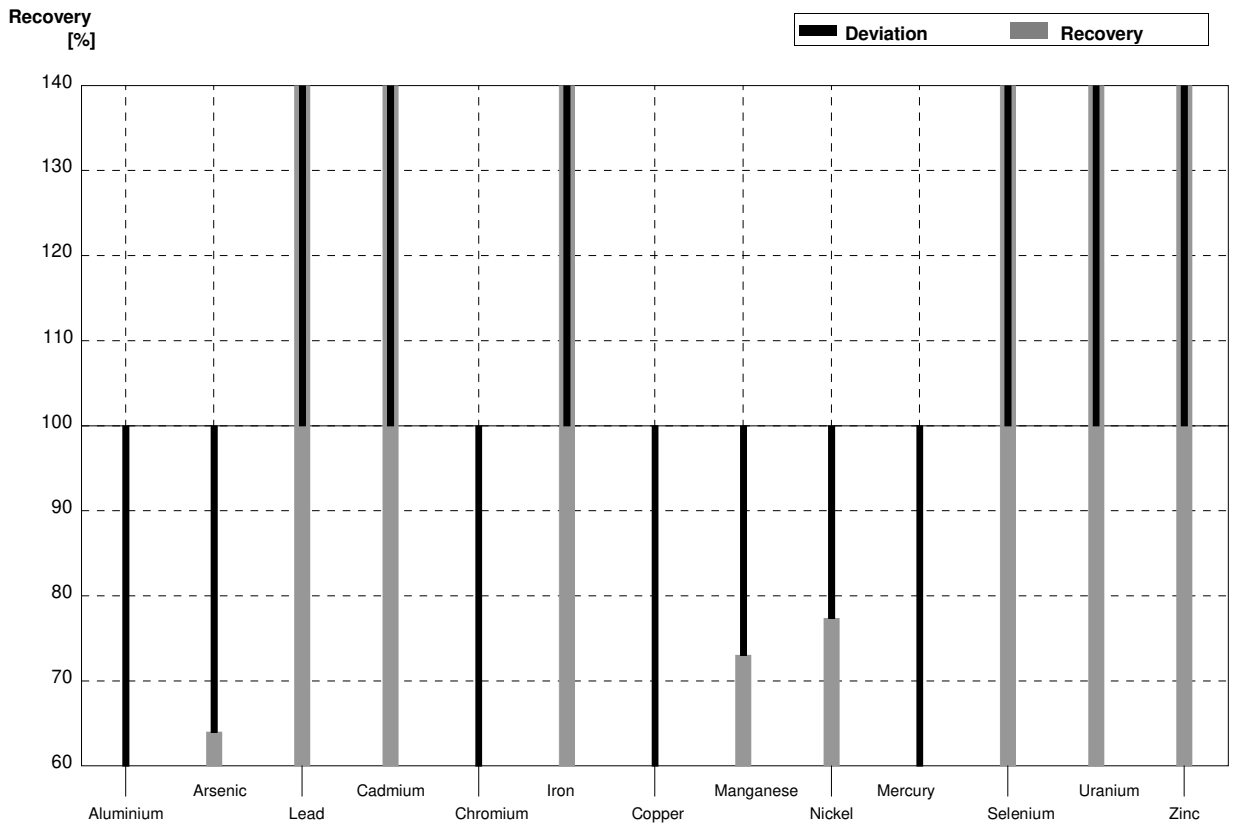
**Sample M176B**  
**Laboratory X**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	19,1	3,8	$\mu\text{g/l}$	127%
Arsenic	1,302	0,013	1,12	0,17	$\mu\text{g/l}$	86%
Lead	5,02	0,03	4,90	0,74	$\mu\text{g/l}$	98%
Cadmium	1,516	0,012	2,03	0,51	$\mu\text{g/l}$	134%
Chromium	0,800	0,011	0,780	0,125	$\mu\text{g/l}$	98%
Iron	68,8	0,3			$\mu\text{g/l}$	
Copper	4,07	0,03	3,58	0,57	$\mu\text{g/l}$	88%
Manganese	26,27	0,15			$\mu\text{g/l}$	
Nickel	4,16	0,04	3,42	0,51	$\mu\text{g/l}$	82%
Mercury	0,856	0,014			$\mu\text{g/l}$	
Selenium	1,61	0,02			$\mu\text{g/l}$	
Uranium	1,713	0,015			$\mu\text{g/l}$	
Zinc	81	4			$\mu\text{g/l}$	



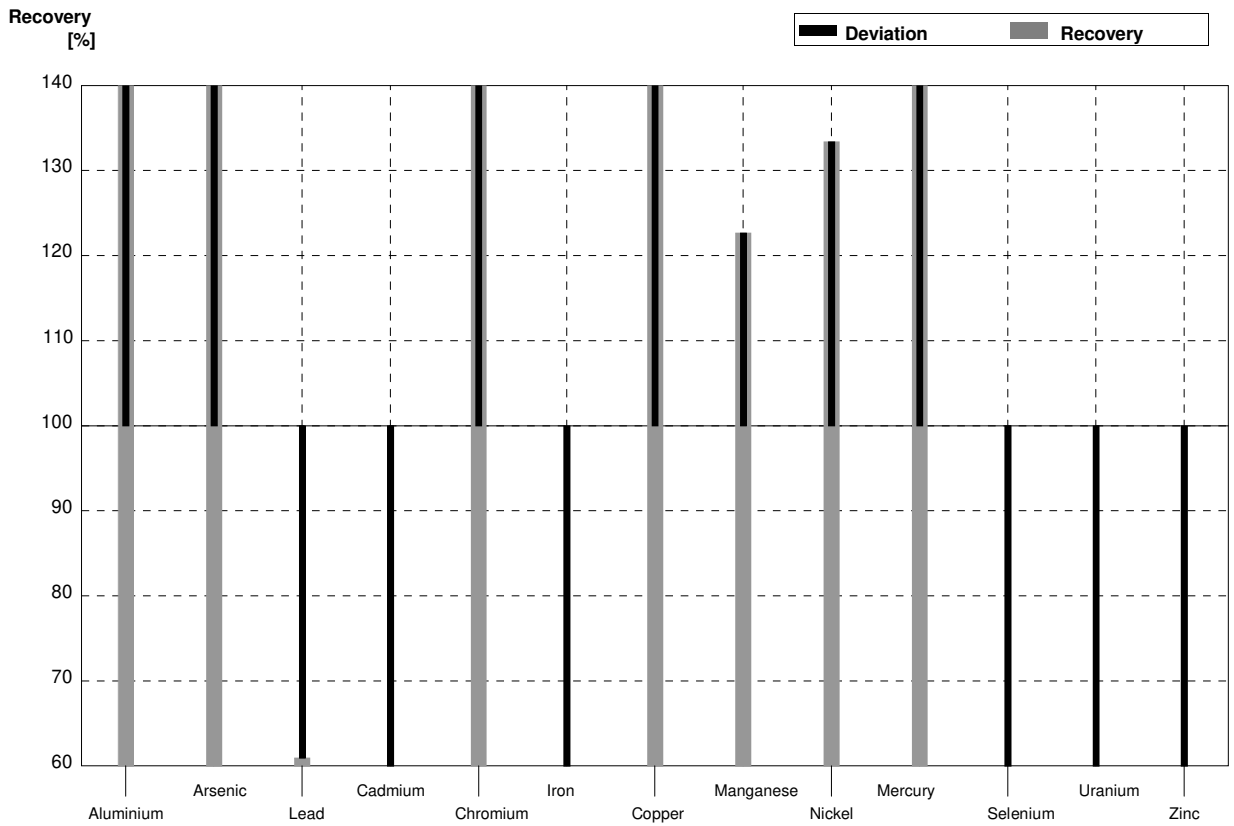
**Sample M176A**  
**Laboratory Y**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	15,17	2,28	$\mu\text{g/l}$	46%
Arsenic	2,031	0,017	1,30	0,16	$\mu\text{g/l}$	64%
Lead	3,03	0,03	4,92	0,69	$\mu\text{g/l}$	162%
Cadmium	0,303	0,003	1,47	0,18	$\mu\text{g/l}$	485%
Chromium	3,65	0,03	0,79	0,12	$\mu\text{g/l}$	22%
Iron	18,3	0,2	66,5	8,65	$\mu\text{g/l}$	363%
Copper	7,91	0,10	4,24	0,55	$\mu\text{g/l}$	54%
Manganese	34,31	0,17	25,06	2,76	$\mu\text{g/l}$	73%
Nickel	5,57	0,05	4,31	0,52	$\mu\text{g/l}$	77%
Mercury	1,597	0,017	0,78	0,172	$\mu\text{g/l}$	49%
Selenium	0,91	0,02	1,59	0,19	$\mu\text{g/l}$	175%
Uranium	0,499	0,006	1,55	0,26	$\mu\text{g/l}$	311%
Zinc	20,0	3,6	85,74	14,58	$\mu\text{g/l}$	429%



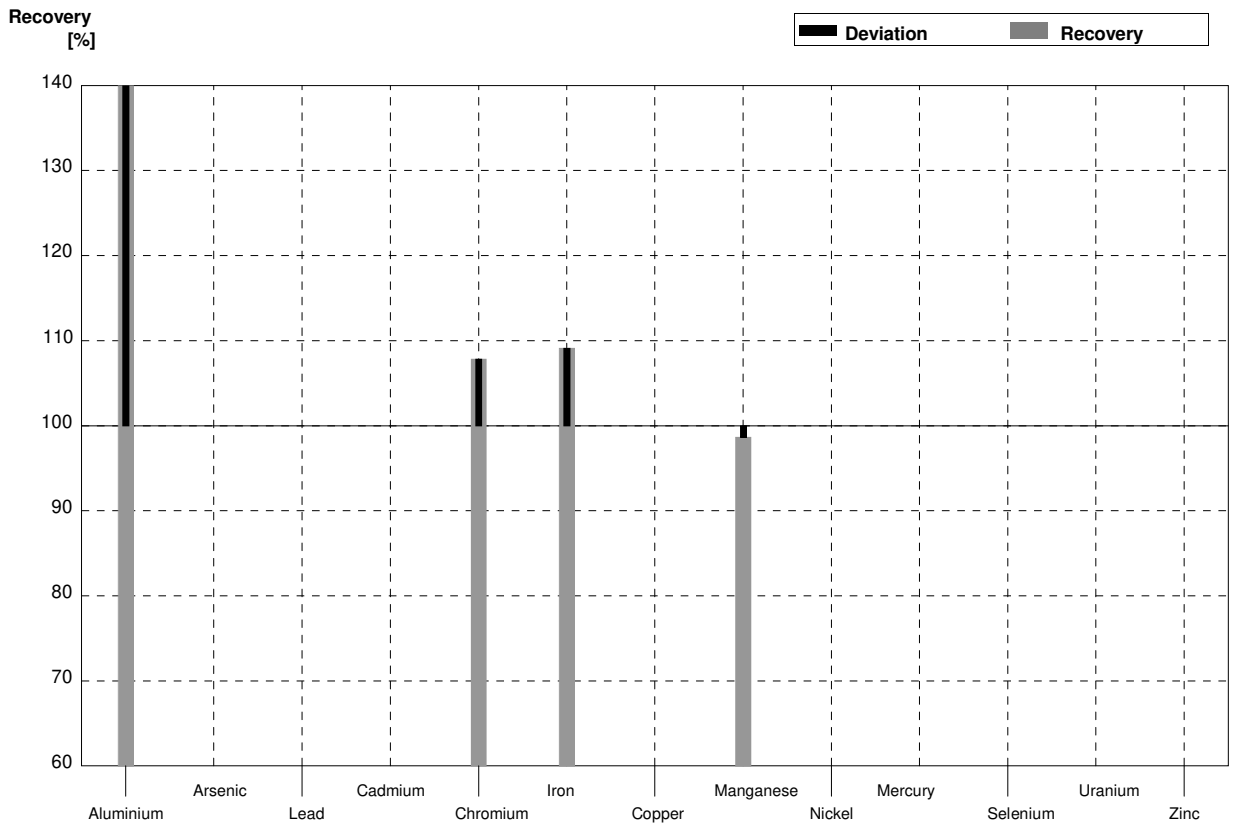
**Sample M176B**  
**Laboratory Y**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	35,08	5,26	$\mu\text{g/l}$	233%
Arsenic	1,302	0,013	1,91	0,23	$\mu\text{g/l}$	147%
Lead	5,02	0,03	3,06	0,43	$\mu\text{g/l}$	61%
Cadmium	1,516	0,012	0,300	0,04	$\mu\text{g/l}$	20%
Chromium	0,800	0,011	3,58	0,54	$\mu\text{g/l}$	448%
Iron	68,8	0,3	18,44	2,40	$\mu\text{g/l}$	27%
Copper	4,07	0,03	8,03	1,04	$\mu\text{g/l}$	197%
Manganese	26,27	0,15	32,23	3,55	$\mu\text{g/l}$	123%
Nickel	4,16	0,04	5,55	0,67	$\mu\text{g/l}$	133%
Mercury	0,856	0,014	1,46	0,32	$\mu\text{g/l}$	171%
Selenium	1,61	0,02	0,91	0,11	$\mu\text{g/l}$	57%
Uranium	1,713	0,015	0,470	0,08	$\mu\text{g/l}$	27%
Zinc	81	4	21,34	3,63	$\mu\text{g/l}$	26%



**Sample M176A**  
**Laboratory Z**

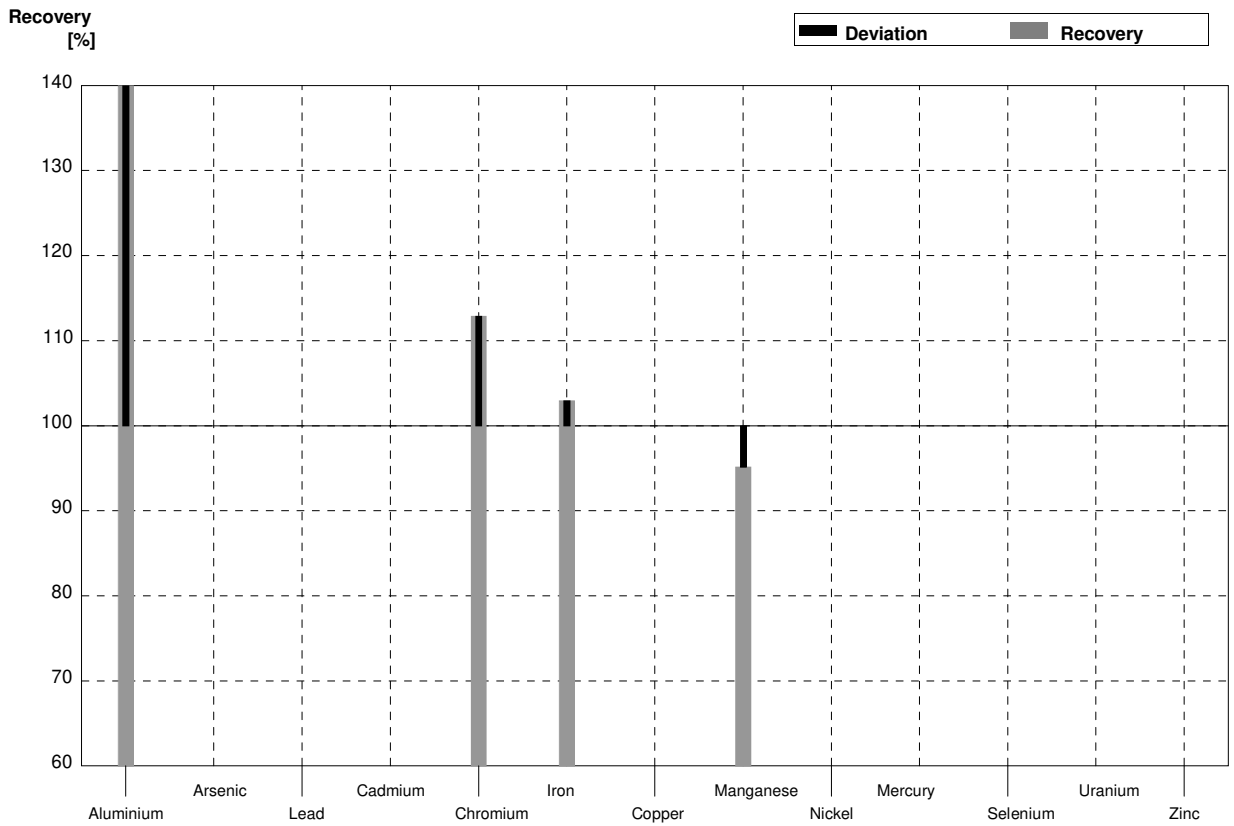
Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	77,53		$\mu\text{g/l}$	236%
Arsenic	2,031	0,017			$\mu\text{g/l}$	
Lead	3,03	0,03			$\mu\text{g/l}$	
Cadmium	0,303	0,003			$\mu\text{g/l}$	
Chromium	3,65	0,03	3,936		$\mu\text{g/l}$	108%
Iron	18,3	0,2	19,97		$\mu\text{g/l}$	109%
Copper	7,91	0,10			$\mu\text{g/l}$	
Manganese	34,31	0,17	33,85		$\mu\text{g/l}$	99%
Nickel	5,57	0,05			$\mu\text{g/l}$	
Mercury	1,597	0,017			$\mu\text{g/l}$	
Selenium	0,91	0,02			$\mu\text{g/l}$	
Uranium	0,499	0,006			$\mu\text{g/l}$	
Zinc	20,0	3,6			$\mu\text{g/l}$	





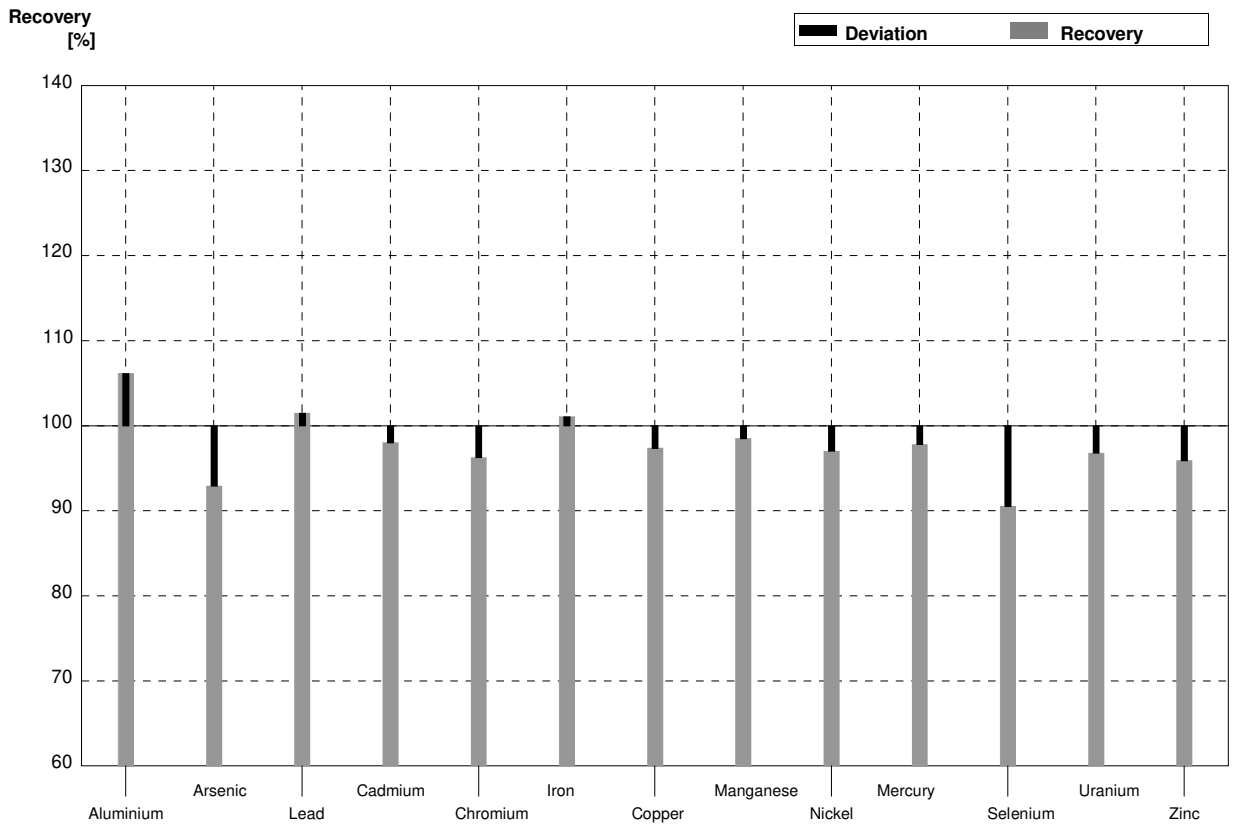
**Sample M176B**  
**Laboratory Z**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	35,73		$\mu\text{g/l}$	237%
Arsenic	1,302	0,013			$\mu\text{g/l}$	
Lead	5,02	0,03			$\mu\text{g/l}$	
Cadmium	1,516	0,012			$\mu\text{g/l}$	
Chromium	0,800	0,011	0,9031		$\mu\text{g/l}$	113%
Iron	68,8	0,3	70,83		$\mu\text{g/l}$	103%
Copper	4,07	0,03			$\mu\text{g/l}$	
Manganese	26,27	0,15	25,00		$\mu\text{g/l}$	95%
Nickel	4,16	0,04			$\mu\text{g/l}$	
Mercury	0,856	0,014			$\mu\text{g/l}$	
Selenium	1,61	0,02			$\mu\text{g/l}$	
Uranium	1,713	0,015			$\mu\text{g/l}$	
Zinc	81	4			$\mu\text{g/l}$	



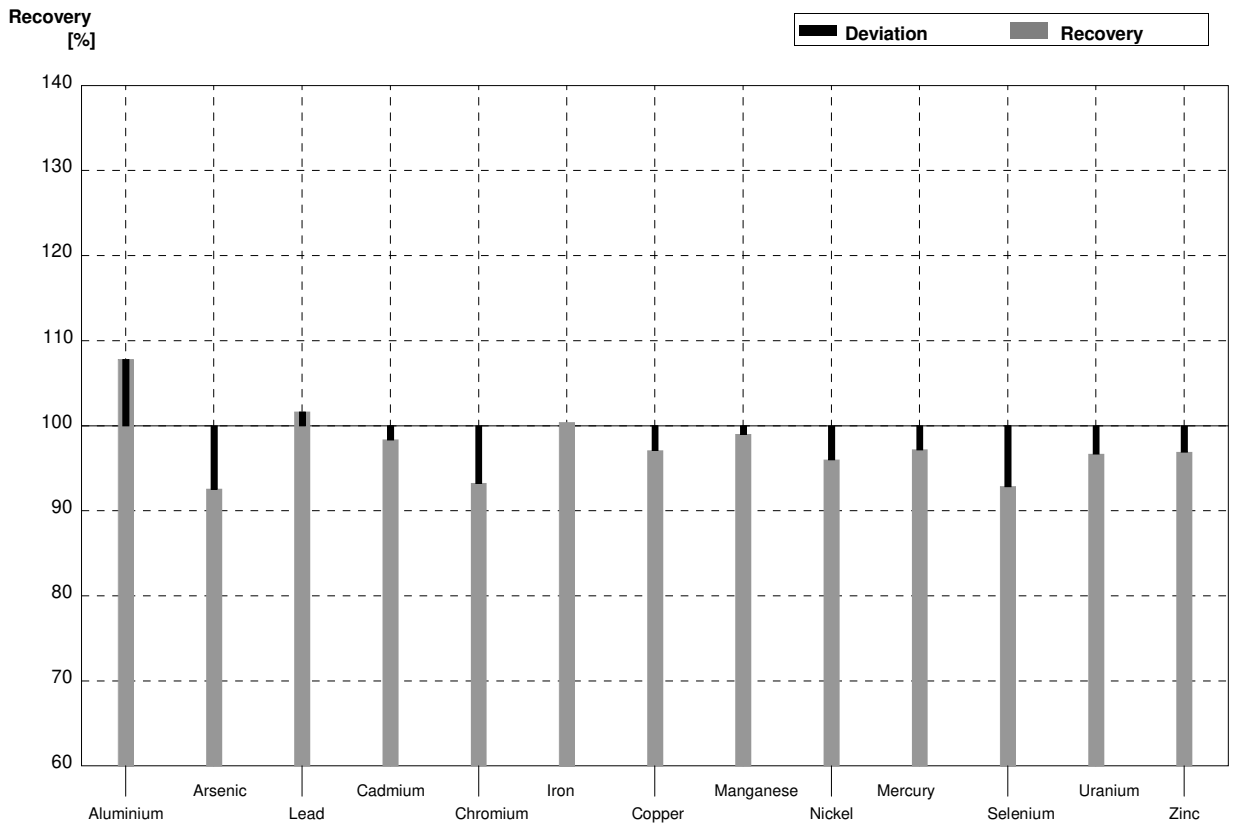
**Sample M176A**  
**Laboratory AA**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	34,817	5,640	$\mu\text{g/l}$	106%
Arsenic	2,031	0,017	1,887	0,283	$\mu\text{g/l}$	93%
Lead	3,03	0,03	3,075	0,375	$\mu\text{g/l}$	101%
Cadmium	0,303	0,003	0,297	0,025	$\mu\text{g/l}$	98%
Chromium	3,65	0,03	3,514	0,257	$\mu\text{g/l}$	96%
Iron	18,3	0,2	18,497	1,887	$\mu\text{g/l}$	101%
Copper	7,91	0,10	7,703	0,863	$\mu\text{g/l}$	97%
Manganese	34,31	0,17	33,794	2,805	$\mu\text{g/l}$	98%
Nickel	5,57	0,05	5,404	0,519	$\mu\text{g/l}$	97%
Mercury	1,597	0,017	1,562	0,073	$\mu\text{g/l}$	98%
Selenium	0,91	0,02	0,824	0,124	$\mu\text{g/l}$	91%
Uranium	0,499	0,006	0,483	0,069	$\mu\text{g/l}$	97%
Zinc	20,0	3,6	19,183	2,877	$\mu\text{g/l}$	96%



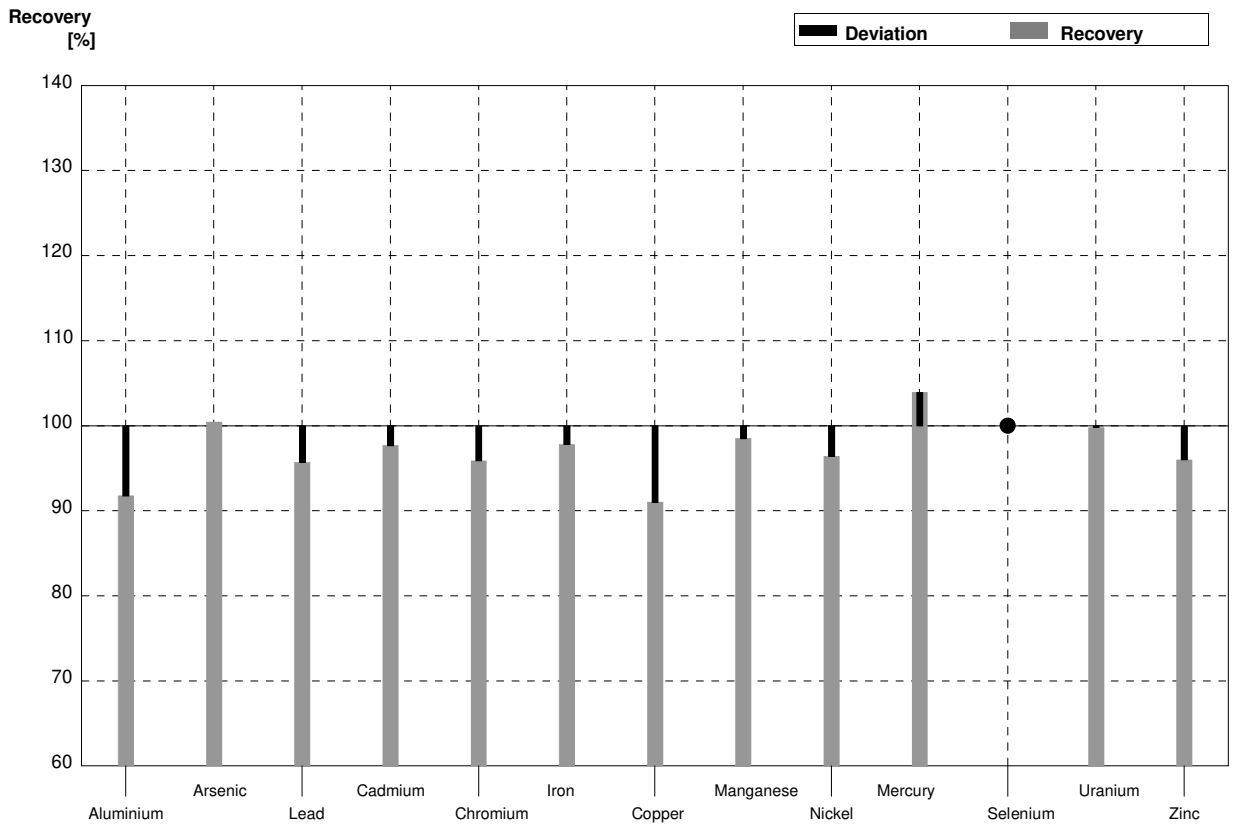
**Sample M176B**  
**Laboratory AA**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	16,248	2,632	$\mu\text{g/l}$	108%
Arsenic	1,302	0,013	1,205	0,181	$\mu\text{g/l}$	93%
Lead	5,02	0,03	5,102	0,626	$\mu\text{g/l}$	102%
Cadmium	1,516	0,012	1,491	0,125	$\mu\text{g/l}$	98%
Chromium	0,800	0,011	0,746	0,054	$\mu\text{g/l}$	93%
Iron	68,8	0,3	69,073	7,045	$\mu\text{g/l}$	100%
Copper	4,07	0,03	3,952	0,443	$\mu\text{g/l}$	97%
Manganese	26,27	0,15	26,006	2,158	$\mu\text{g/l}$	99%
Nickel	4,16	0,04	3,994	0,383	$\mu\text{g/l}$	96%
Mercury	0,856	0,014	0,832	0,039	$\mu\text{g/l}$	97%
Selenium	1,61	0,02	1,495	0,224	$\mu\text{g/l}$	93%
Uranium	1,713	0,015	1,656	0,237	$\mu\text{g/l}$	97%
Zinc	81	4	78,498	11,775	$\mu\text{g/l}$	97%



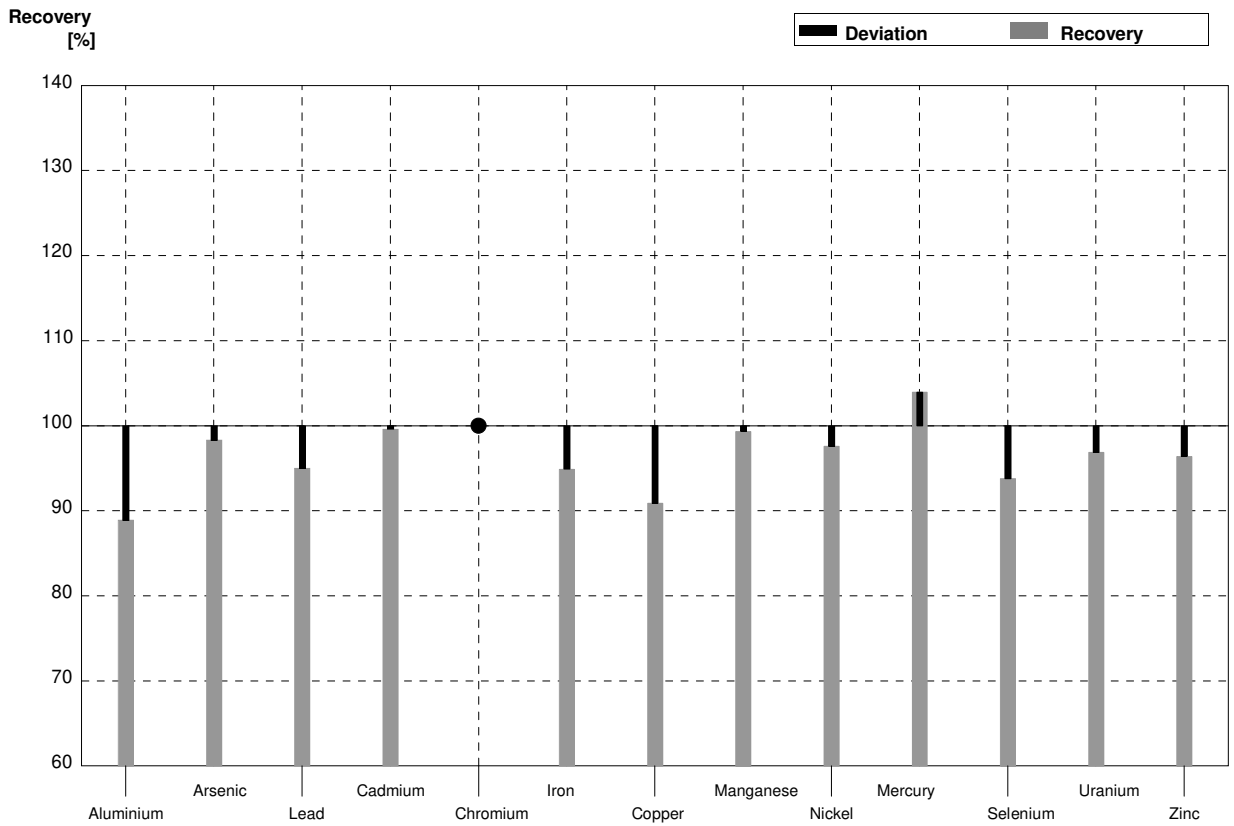
**Sample M176A**  
**Laboratory AB**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	30,1	6,0	$\mu\text{g/l}$	92%
Arsenic	2,031	0,017	2,04	0,31	$\mu\text{g/l}$	100%
Lead	3,03	0,03	2,90	0,35	$\mu\text{g/l}$	96%
Cadmium	0,303	0,003	0,296	0,036	$\mu\text{g/l}$	98%
Chromium	3,65	0,03	3,50	0,53	$\mu\text{g/l}$	96%
Iron	18,3	0,2	17,9	2,7	$\mu\text{g/l}$	98%
Copper	7,91	0,10	7,20	0,86	$\mu\text{g/l}$	91%
Manganese	34,31	0,17	33,8	4,1	$\mu\text{g/l}$	99%
Nickel	5,57	0,05	5,37	0,59	$\mu\text{g/l}$	96%
Mercury	1,597	0,017	1,66	0,37	$\mu\text{g/l}$	104%
Selenium	0,91	0,02	<1,0		$\mu\text{g/l}$	•
Uranium	0,499	0,006	0,498	0,075	$\mu\text{g/l}$	100%
Zinc	20,0	3,6	19,2	2,9	$\mu\text{g/l}$	96%



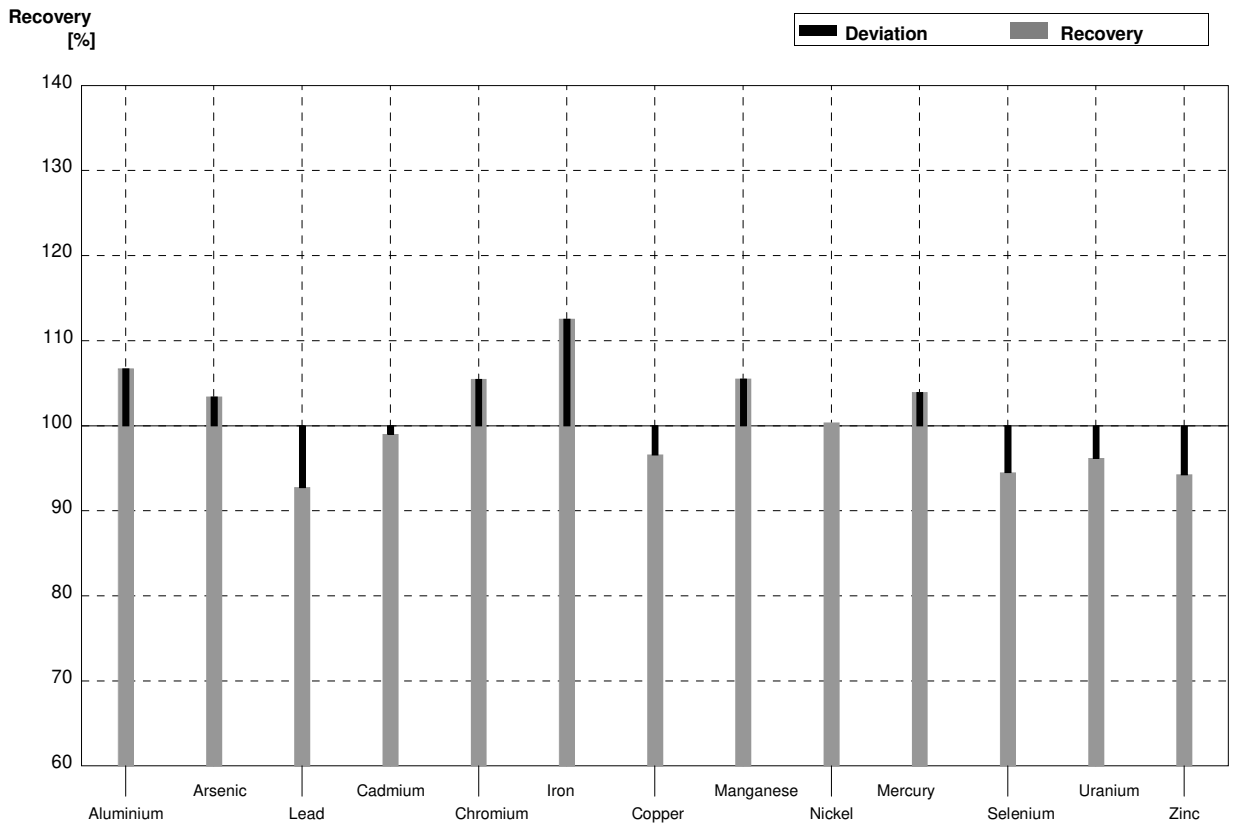
**Sample M176B**  
**Laboratory AB**

Parameter	Assigned value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,07	0,18	13,4	2,7	µg/l	89%
Arsenic	1,302	0,013	1,28	0,19	µg/l	98%
Lead	5,02	0,03	4,77	0,57	µg/l	95%
Cadmium	1,516	0,012	1,51	0,18	µg/l	100%
Chromium	0,800	0,011	<1,0		µg/l	•
Iron	68,8	0,3	65,3	9,8	µg/l	95%
Copper	4,07	0,03	3,70	0,44	µg/l	91%
Manganese	26,27	0,15	26,1	3,1	µg/l	99%
Nickel	4,16	0,04	4,06	0,45	µg/l	98%
Mercury	0,856	0,014	0,890	0,20	µg/l	104%
Selenium	1,61	0,02	1,51	0,23	µg/l	94%
Uranium	1,713	0,015	1,66	0,25	µg/l	97%
Zinc	81	4	78,1	12	µg/l	96%



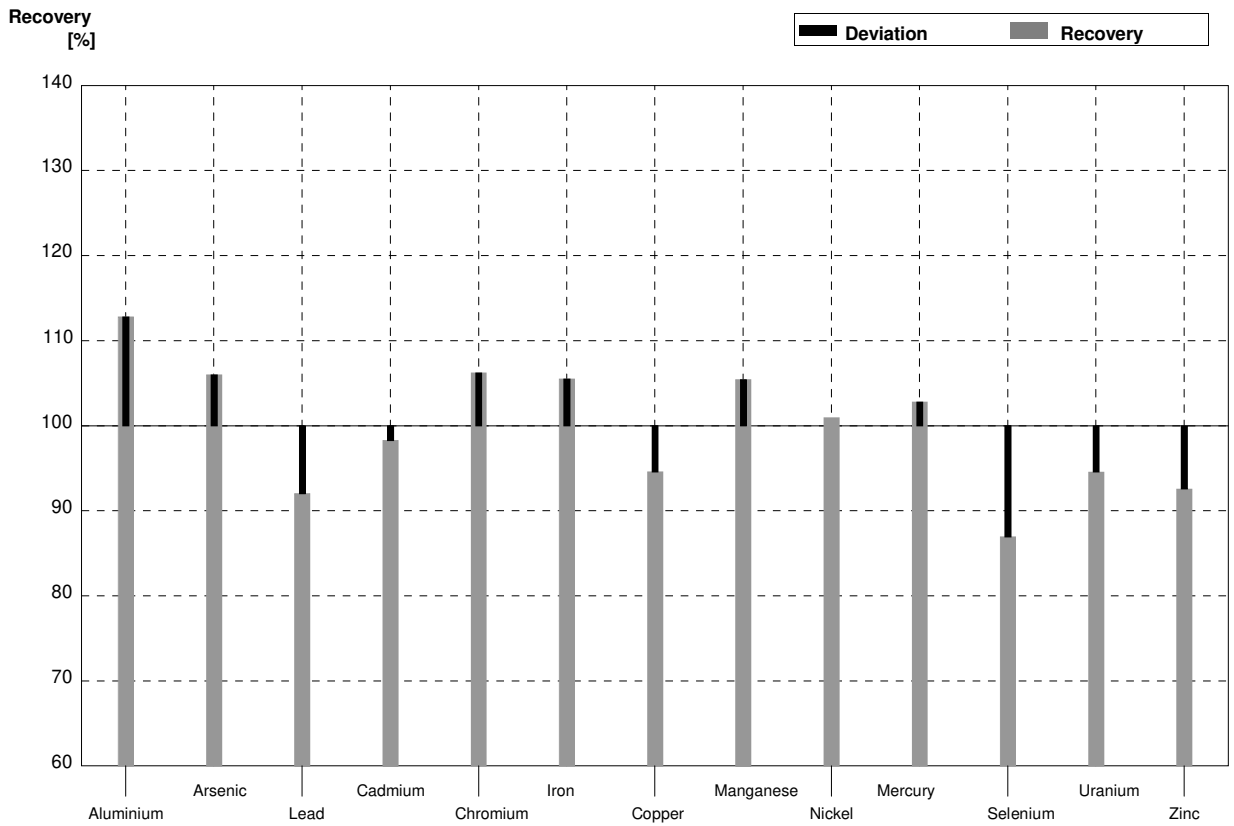
**Sample M176A**  
**Laboratory AC**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	35,0		$\mu\text{g/l}$	107%
Arsenic	2,031	0,017	2,10		$\mu\text{g/l}$	103%
Lead	3,03	0,03	2,81		$\mu\text{g/l}$	93%
Cadmium	0,303	0,003	0,300		$\mu\text{g/l}$	99%
Chromium	3,65	0,03	3,85		$\mu\text{g/l}$	105%
Iron	18,3	0,2	20,6		$\mu\text{g/l}$	113%
Copper	7,91	0,10	7,64		$\mu\text{g/l}$	97%
Manganese	34,31	0,17	36,2		$\mu\text{g/l}$	106%
Nickel	5,57	0,05	5,59		$\mu\text{g/l}$	100%
Mercury	1,597	0,017	1,66		$\mu\text{g/l}$	104%
Selenium	0,91	0,02	0,86		$\mu\text{g/l}$	95%
Uranium	0,499	0,006	0,480		$\mu\text{g/l}$	96%
Zinc	20,0	3,6	18,85		$\mu\text{g/l}$	94%



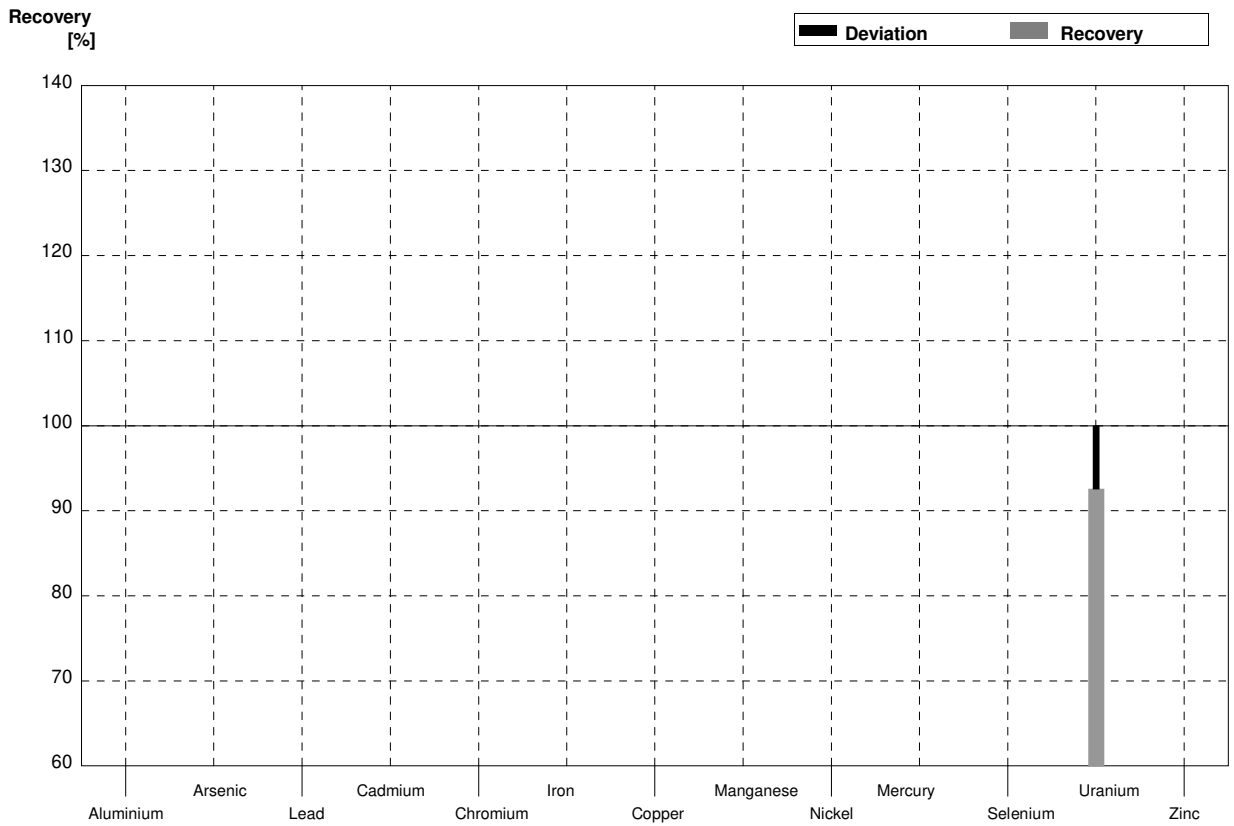
**Sample M176B**  
**Laboratory AC**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	17,0		$\mu\text{g/l}$	113%
Arsenic	1,302	0,013	1,38		$\mu\text{g/l}$	106%
Lead	5,02	0,03	4,62		$\mu\text{g/l}$	92%
Cadmium	1,516	0,012	1,49		$\mu\text{g/l}$	98%
Chromium	0,800	0,011	0,85		$\mu\text{g/l}$	106%
Iron	68,8	0,3	72,6		$\mu\text{g/l}$	106%
Copper	4,07	0,03	3,85		$\mu\text{g/l}$	95%
Manganese	26,27	0,15	27,7		$\mu\text{g/l}$	105%
Nickel	4,16	0,04	4,20		$\mu\text{g/l}$	101%
Mercury	0,856	0,014	0,88		$\mu\text{g/l}$	103%
Selenium	1,61	0,02	1,40		$\mu\text{g/l}$	87%
Uranium	1,713	0,015	1,62		$\mu\text{g/l}$	95%
Zinc	81	4	75,0		$\mu\text{g/l}$	93%



**Sample M176A**  
**Laboratory AD**

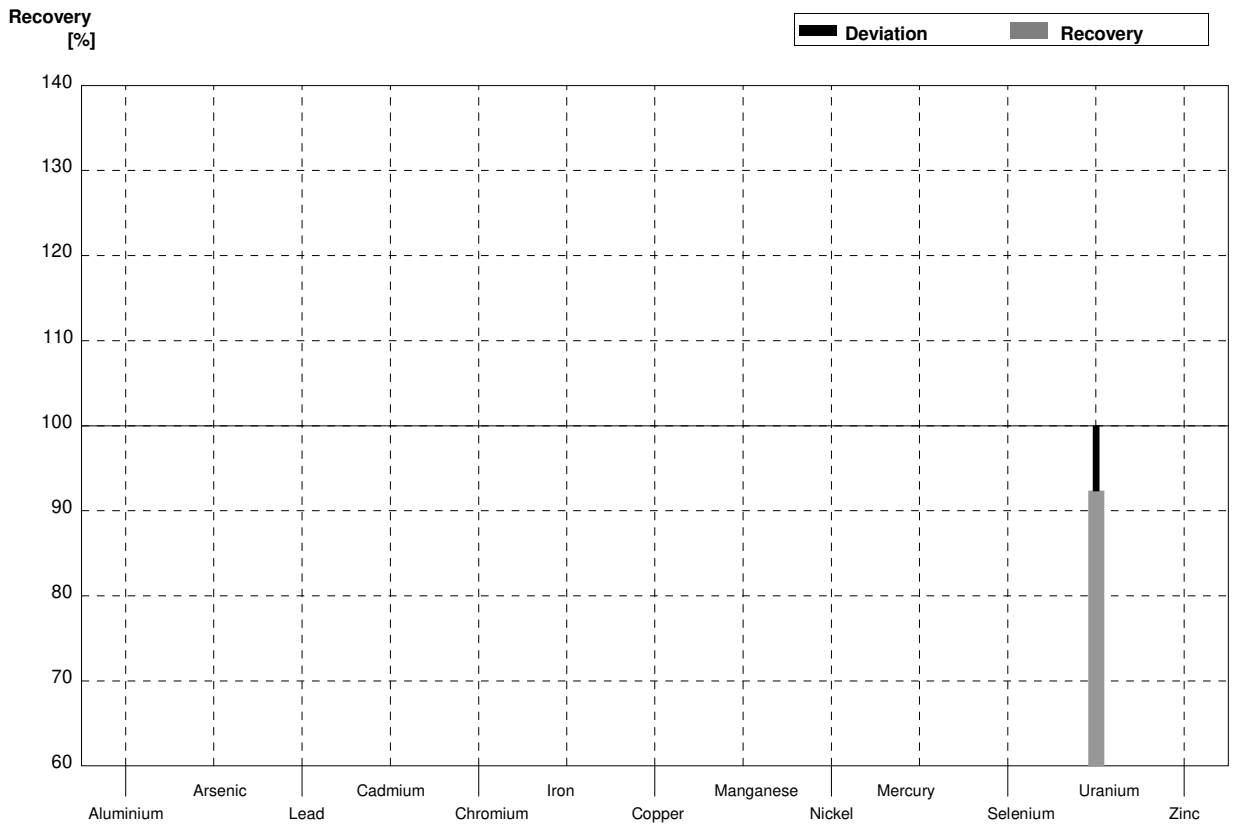
Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3			$\mu\text{g/l}$	
Arsenic	2,031	0,017			$\mu\text{g/l}$	
Lead	3,03	0,03			$\mu\text{g/l}$	
Cadmium	0,303	0,003			$\mu\text{g/l}$	
Chromium	3,65	0,03			$\mu\text{g/l}$	
Iron	18,3	0,2			$\mu\text{g/l}$	
Copper	7,91	0,10			$\mu\text{g/l}$	
Manganese	34,31	0,17			$\mu\text{g/l}$	
Nickel	5,57	0,05			$\mu\text{g/l}$	
Mercury	1,597	0,017			$\mu\text{g/l}$	
Selenium	0,91	0,02			$\mu\text{g/l}$	
Uranium	0,499	0,006	0,462	0,072	$\mu\text{g/l}$	93%
Zinc	20,0	3,6			$\mu\text{g/l}$	





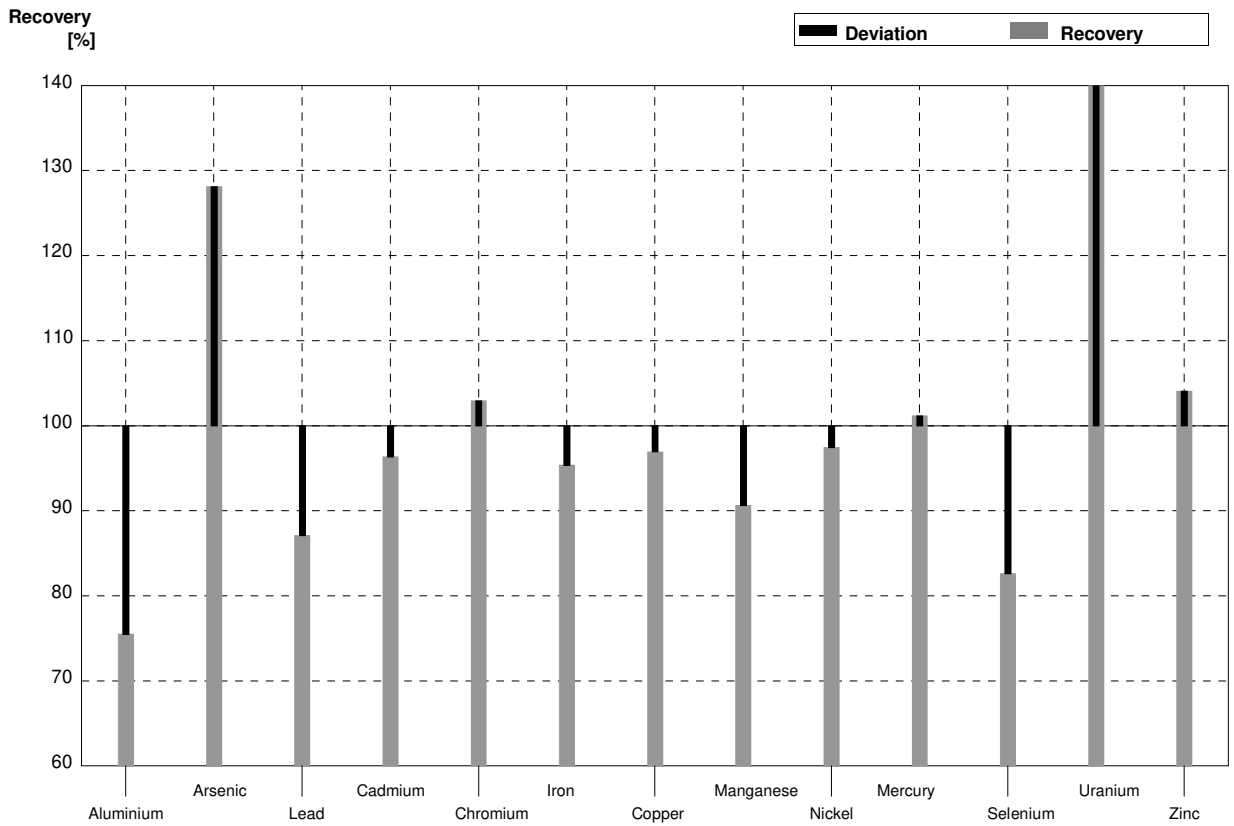
**Sample M176B**  
**Laboratory AD**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18			$\mu\text{g/l}$	
Arsenic	1,302	0,013			$\mu\text{g/l}$	
Lead	5,02	0,03			$\mu\text{g/l}$	
Cadmium	1,516	0,012			$\mu\text{g/l}$	
Chromium	0,800	0,011			$\mu\text{g/l}$	
Iron	68,8	0,3			$\mu\text{g/l}$	
Copper	4,07	0,03			$\mu\text{g/l}$	
Manganese	26,27	0,15			$\mu\text{g/l}$	
Nickel	4,16	0,04			$\mu\text{g/l}$	
Mercury	0,856	0,014			$\mu\text{g/l}$	
Selenium	1,61	0,02			$\mu\text{g/l}$	
Uranium	1,713	0,015	1,582	0,250	$\mu\text{g/l}$	92%
Zinc	81	4			$\mu\text{g/l}$	



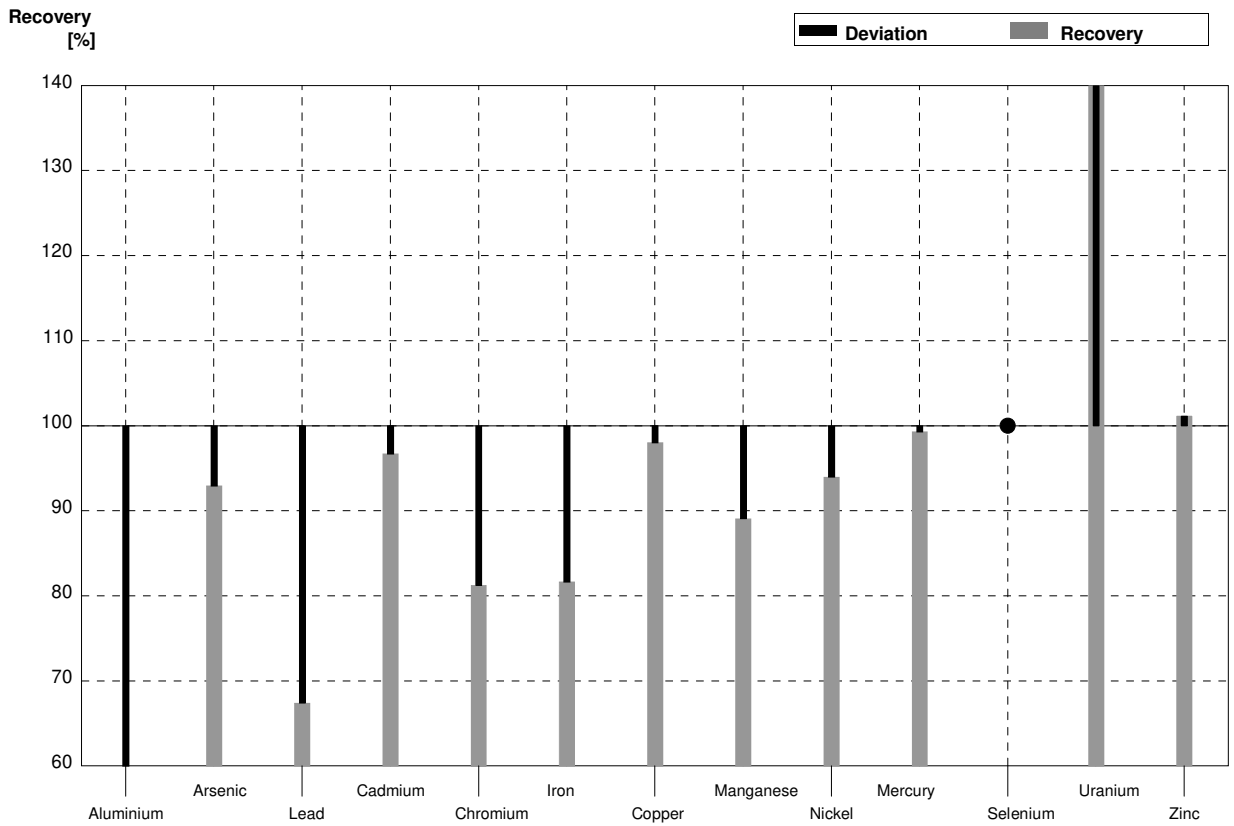
**Sample M176A**  
**Laboratory AE**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	24,77		$\mu\text{g/l}$	76%
Arsenic	2,031	0,017	2,602		$\mu\text{g/l}$	128%
Lead	3,03	0,03	2,639		$\mu\text{g/l}$	87%
Cadmium	0,303	0,003	0,292		$\mu\text{g/l}$	96%
Chromium	3,65	0,03	3,758		$\mu\text{g/l}$	103%
Iron	18,3	0,2	17,455		$\mu\text{g/l}$	95%
Copper	7,91	0,10	7,668		$\mu\text{g/l}$	97%
Manganese	34,31	0,17	31,10		$\mu\text{g/l}$	91%
Nickel	5,57	0,05	5,429		$\mu\text{g/l}$	97%
Mercury	1,597	0,017	1,616		$\mu\text{g/l}$	101%
Selenium	0,91	0,02	0,752		$\mu\text{g/l}$	83%
Uranium	0,499	0,006	3,400		$\mu\text{g/l}$	681%
Zinc	20,0	3,6	20,82		$\mu\text{g/l}$	104%



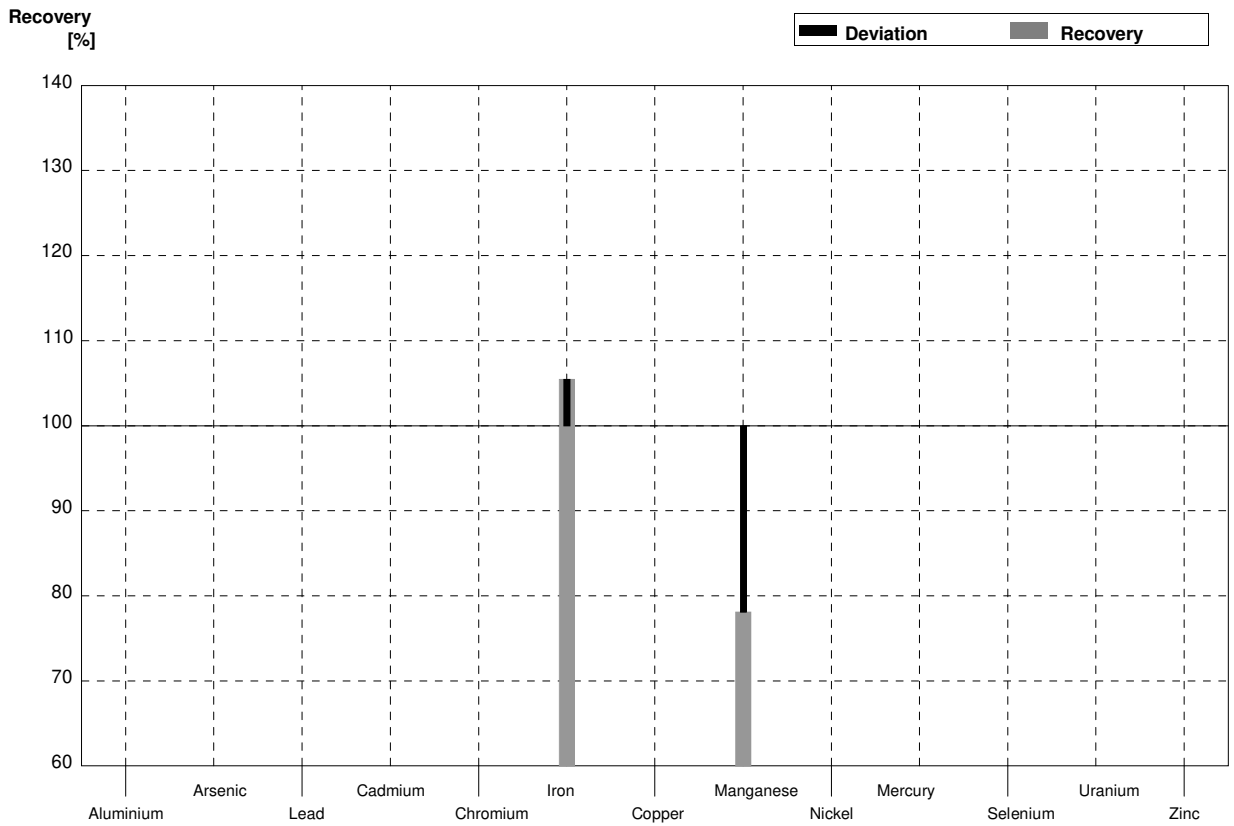
**Sample M176B**  
**Laboratory AE**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	8,471		$\mu\text{g/l}$	56%
Arsenic	1,302	0,013	1,210		$\mu\text{g/l}$	93%
Lead	5,02	0,03	3,384		$\mu\text{g/l}$	67%
Cadmium	1,516	0,012	1,466		$\mu\text{g/l}$	97%
Chromium	0,800	0,011	0,650		$\mu\text{g/l}$	81%
Iron	68,8	0,3	56,167		$\mu\text{g/l}$	82%
Copper	4,07	0,03	3,990		$\mu\text{g/l}$	98%
Manganese	26,27	0,15	23,40		$\mu\text{g/l}$	89%
Nickel	4,16	0,04	3,909		$\mu\text{g/l}$	94%
Mercury	0,856	0,014	0,850		$\mu\text{g/l}$	99%
Selenium	1,61	0,02	<10		$\mu\text{g/l}$	•
Uranium	1,713	0,015	4,515		$\mu\text{g/l}$	264%
Zinc	81	4	81,92		$\mu\text{g/l}$	101%



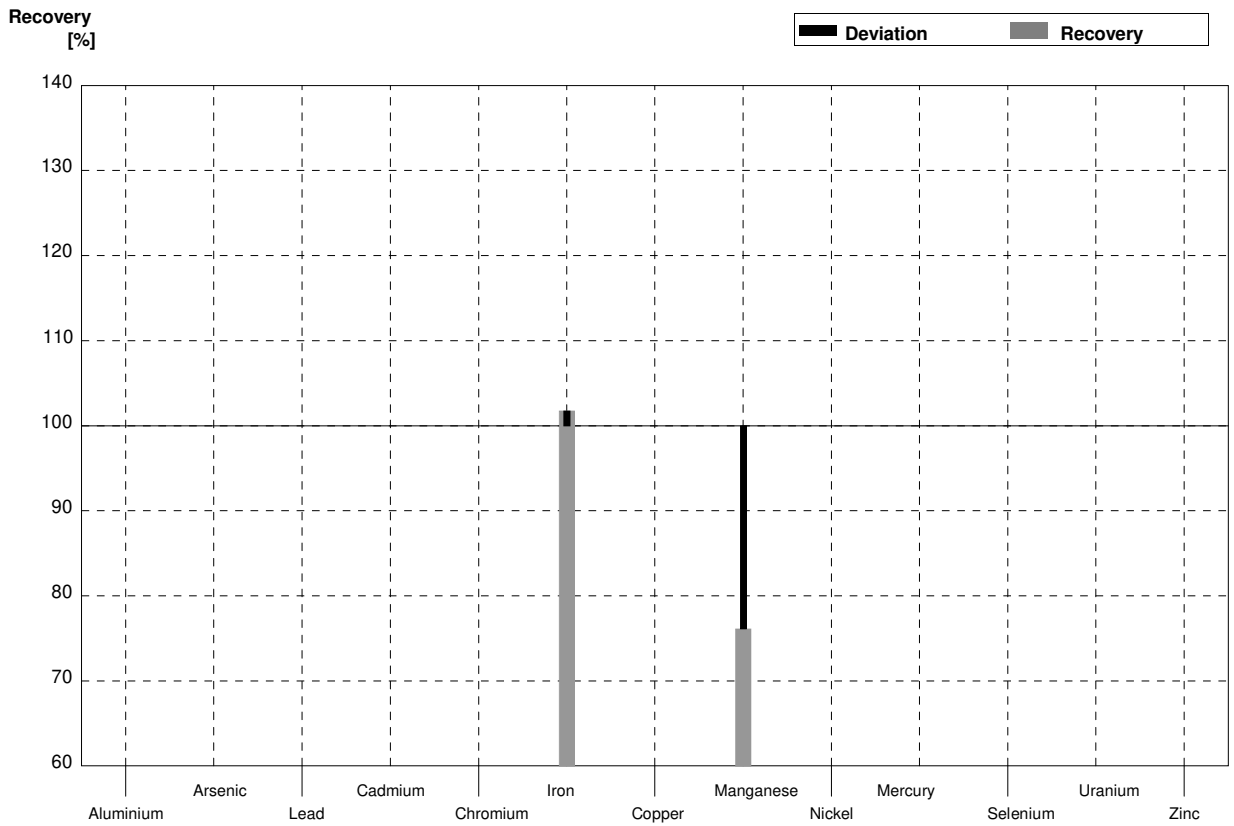
**Sample M176A**  
**Laboratory AF**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3			$\mu\text{g/l}$	
Arsenic	2,031	0,017			$\mu\text{g/l}$	
Lead	3,03	0,03			$\mu\text{g/l}$	
Cadmium	0,303	0,003			$\mu\text{g/l}$	
Chromium	3,65	0,03			$\mu\text{g/l}$	
Iron	18,3	0,2	19,3		$\mu\text{g/l}$	105%
Copper	7,91	0,10			$\mu\text{g/l}$	
Manganese	34,31	0,17	26,8		$\mu\text{g/l}$	78%
Nickel	5,57	0,05			$\mu\text{g/l}$	
Mercury	1,597	0,017			$\mu\text{g/l}$	
Selenium	0,91	0,02			$\mu\text{g/l}$	
Uranium	0,499	0,006			$\mu\text{g/l}$	
Zinc	20,0	3,6			$\mu\text{g/l}$	



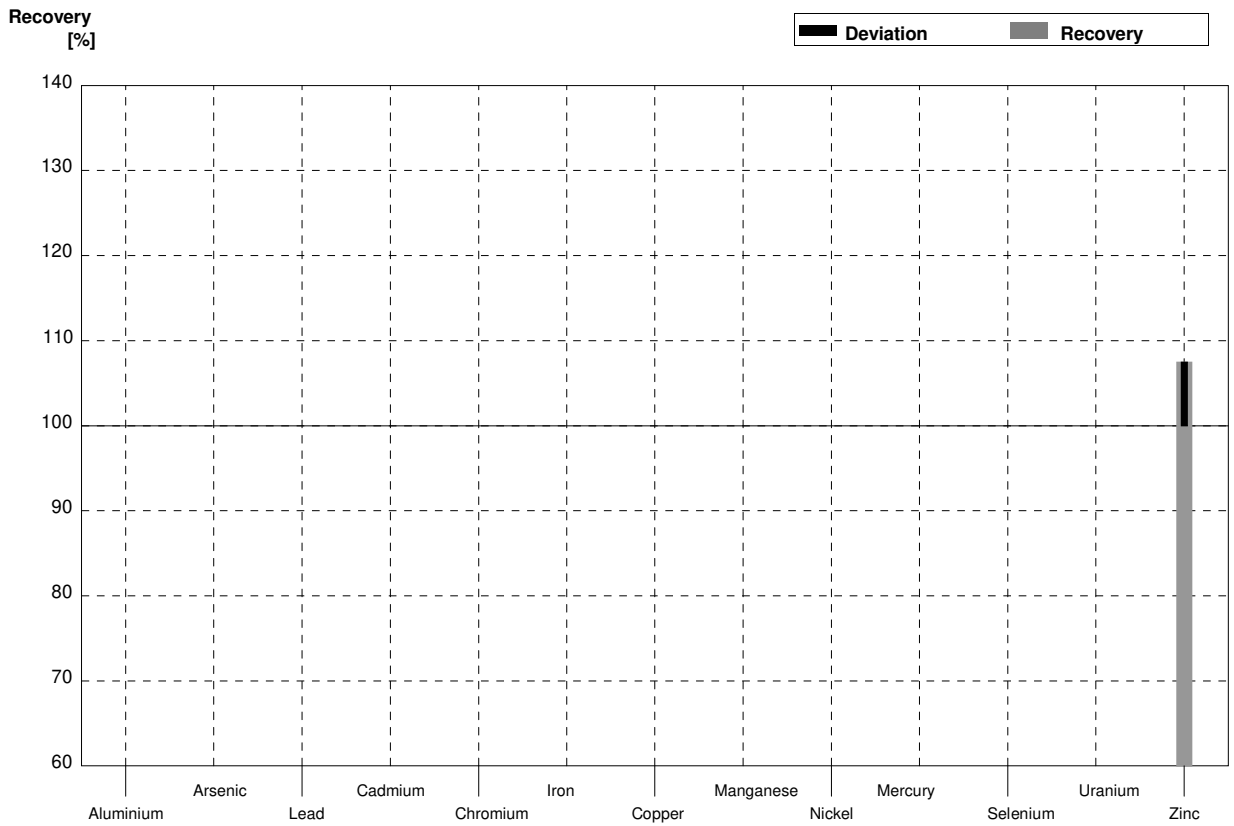
**Sample M176B**  
**Laboratory AF**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18			$\mu\text{g/l}$	
Arsenic	1,302	0,013			$\mu\text{g/l}$	
Lead	5,02	0,03			$\mu\text{g/l}$	
Cadmium	1,516	0,012			$\mu\text{g/l}$	
Chromium	0,800	0,011			$\mu\text{g/l}$	
Iron	68,8	0,3	70		$\mu\text{g/l}$	102%
Copper	4,07	0,03			$\mu\text{g/l}$	
Manganese	26,27	0,15	20,0		$\mu\text{g/l}$	76%
Nickel	4,16	0,04			$\mu\text{g/l}$	
Mercury	0,856	0,014			$\mu\text{g/l}$	
Selenium	1,61	0,02			$\mu\text{g/l}$	
Uranium	1,713	0,015			$\mu\text{g/l}$	
Zinc	81	4			$\mu\text{g/l}$	



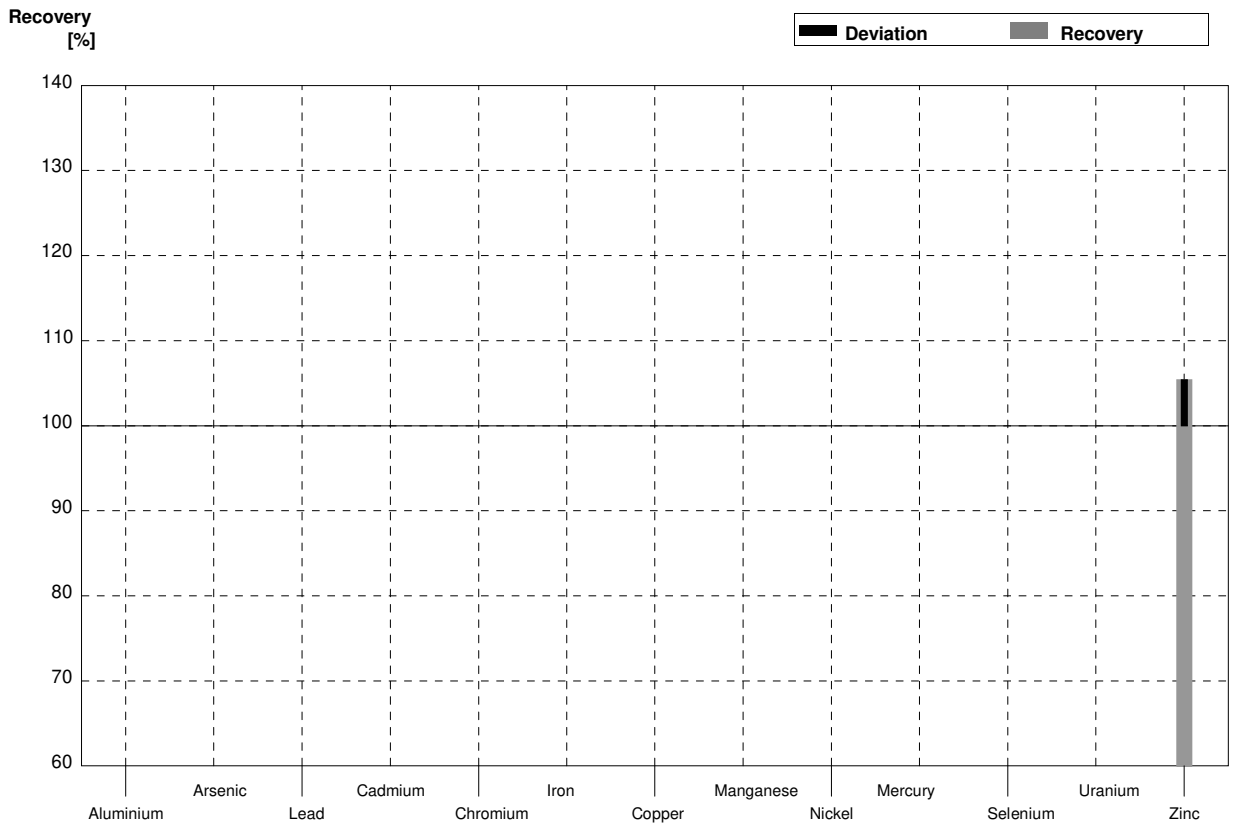
**Sample M176A**  
**Laboratory AG**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3			$\mu\text{g/l}$	
Arsenic	2,031	0,017			$\mu\text{g/l}$	
Lead	3,03	0,03			$\mu\text{g/l}$	
Cadmium	0,303	0,003			$\mu\text{g/l}$	
Chromium	3,65	0,03			$\mu\text{g/l}$	
Iron	18,3	0,2			$\mu\text{g/l}$	
Copper	7,91	0,10			$\mu\text{g/l}$	
Manganese	34,31	0,17			$\mu\text{g/l}$	
Nickel	5,57	0,05			$\mu\text{g/l}$	
Mercury	1,597	0,017			$\mu\text{g/l}$	
Selenium	0,91	0,02			$\mu\text{g/l}$	
Uranium	0,499	0,006			$\mu\text{g/l}$	
Zinc	20,0	3,6	21,5		$\mu\text{g/l}$	108%



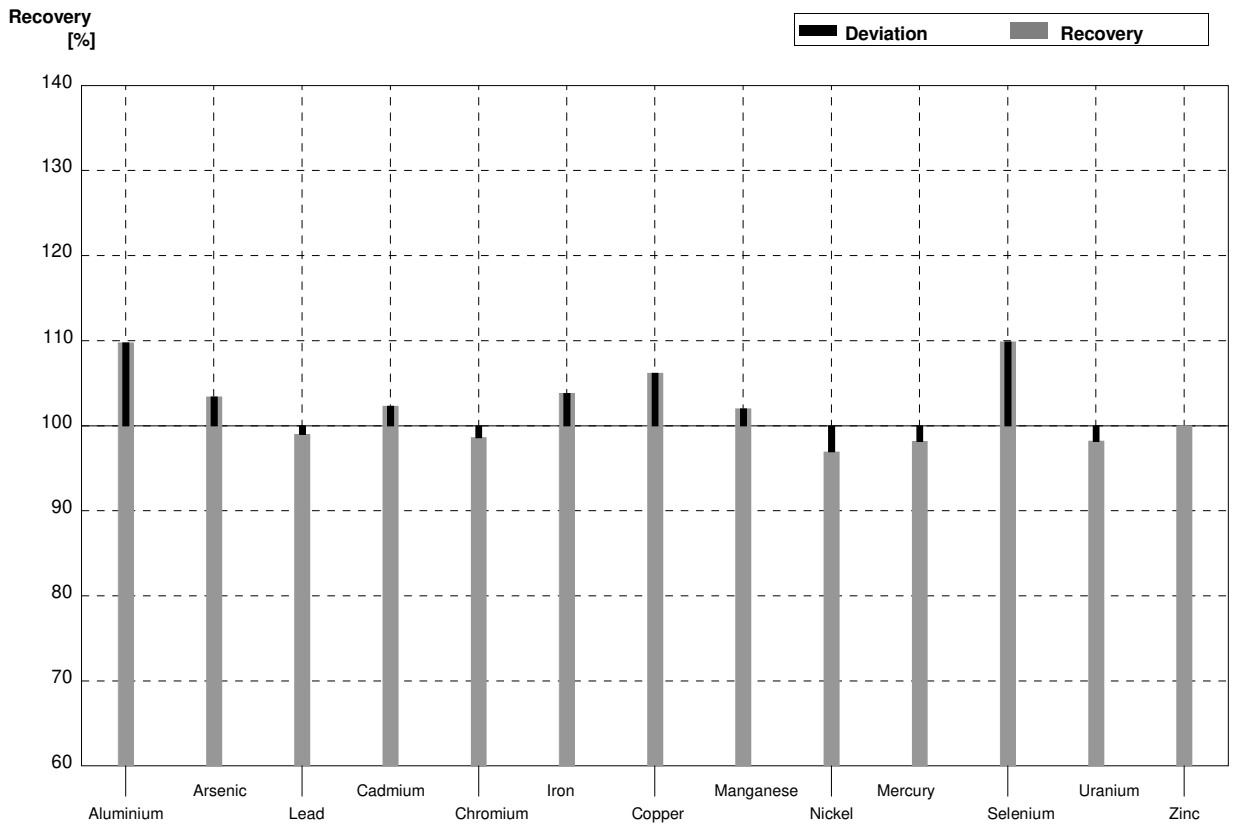
**Sample M176B**  
**Laboratory AG**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18			$\mu\text{g/l}$	
Arsenic	1,302	0,013			$\mu\text{g/l}$	
Lead	5,02	0,03			$\mu\text{g/l}$	
Cadmium	1,516	0,012			$\mu\text{g/l}$	
Chromium	0,800	0,011			$\mu\text{g/l}$	
Iron	68,8	0,3			$\mu\text{g/l}$	
Copper	4,07	0,03			$\mu\text{g/l}$	
Manganese	26,27	0,15			$\mu\text{g/l}$	
Nickel	4,16	0,04			$\mu\text{g/l}$	
Mercury	0,856	0,014			$\mu\text{g/l}$	
Selenium	1,61	0,02			$\mu\text{g/l}$	
Uranium	1,713	0,015			$\mu\text{g/l}$	
Zinc	81	4	85,4		$\mu\text{g/l}$	105%



**Sample M176A**  
**Laboratory AH**

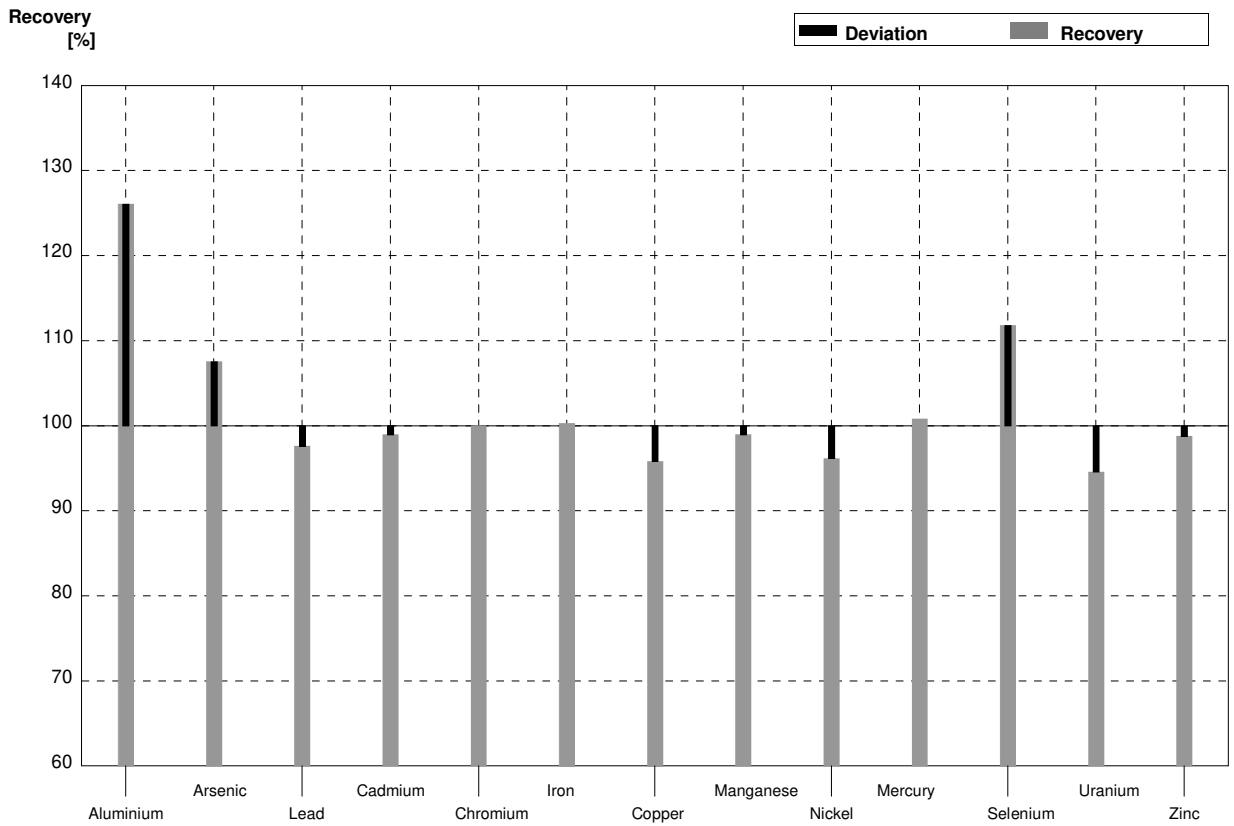
Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	32,8	0,3	36,0	3,60	$\mu\text{g/l}$	110%
Arsenic	2,031	0,017	2,10	0,252	$\mu\text{g/l}$	103%
Lead	3,03	0,03	3,00	0,240	$\mu\text{g/l}$	99%
Cadmium	0,303	0,003	0,310	0,0248	$\mu\text{g/l}$	102%
Chromium	3,65	0,03	3,60	0,432	$\mu\text{g/l}$	99%
Iron	18,3	0,2	19,0	4,94	$\mu\text{g/l}$	104%
Copper	7,91	0,10	8,40	0,672	$\mu\text{g/l}$	106%
Manganese	34,31	0,17	35,0	3,50	$\mu\text{g/l}$	102%
Nickel	5,57	0,05	5,40	0,540	$\mu\text{g/l}$	97%
Mercury	1,597	0,017	1,568	0,2352	$\mu\text{g/l}$	98%
Selenium	0,91	0,02	1,00	0,150	$\mu\text{g/l}$	110%
Uranium	0,499	0,006	0,490	0,025	$\mu\text{g/l}$	98%
Zinc	20,0	3,6	20,0	2,00	$\mu\text{g/l}$	100%





**Sample M176B**  
**Laboratory AH**

Parameter	Assigned value	$\pm U (k=2)$	Result	$\pm$	Unit	Recovery
Aluminium	15,07	0,18	19,0	1,90	$\mu\text{g/l}$	126%
Arsenic	1,302	0,013	1,40	0,168	$\mu\text{g/l}$	108%
Lead	5,02	0,03	4,90	0,392	$\mu\text{g/l}$	98%
Cadmium	1,516	0,012	1,50	0,120	$\mu\text{g/l}$	99%
Chromium	0,800	0,011	0,800	0,096	$\mu\text{g/l}$	100%
Iron	68,8	0,3	69,0	17,94	$\mu\text{g/l}$	100%
Copper	4,07	0,03	3,90	0,312	$\mu\text{g/l}$	96%
Manganese	26,27	0,15	26,0	2,60	$\mu\text{g/l}$	99%
Nickel	4,16	0,04	4,00	0,400	$\mu\text{g/l}$	96%
Mercury	0,856	0,014	0,863	0,129	$\mu\text{g/l}$	101%
Selenium	1,61	0,02	1,80	0,270	$\mu\text{g/l}$	112%
Uranium	1,713	0,015	1,62	0,081	$\mu\text{g/l}$	95%
Zinc	81	4	80,0	8,00	$\mu\text{g/l}$	99%







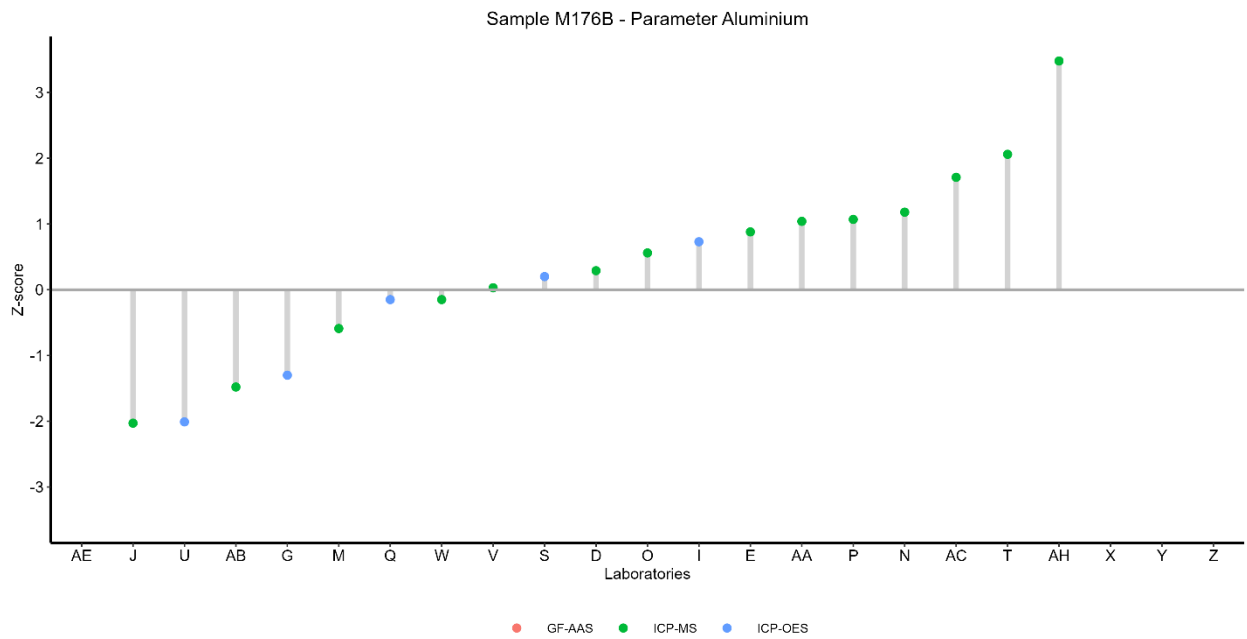
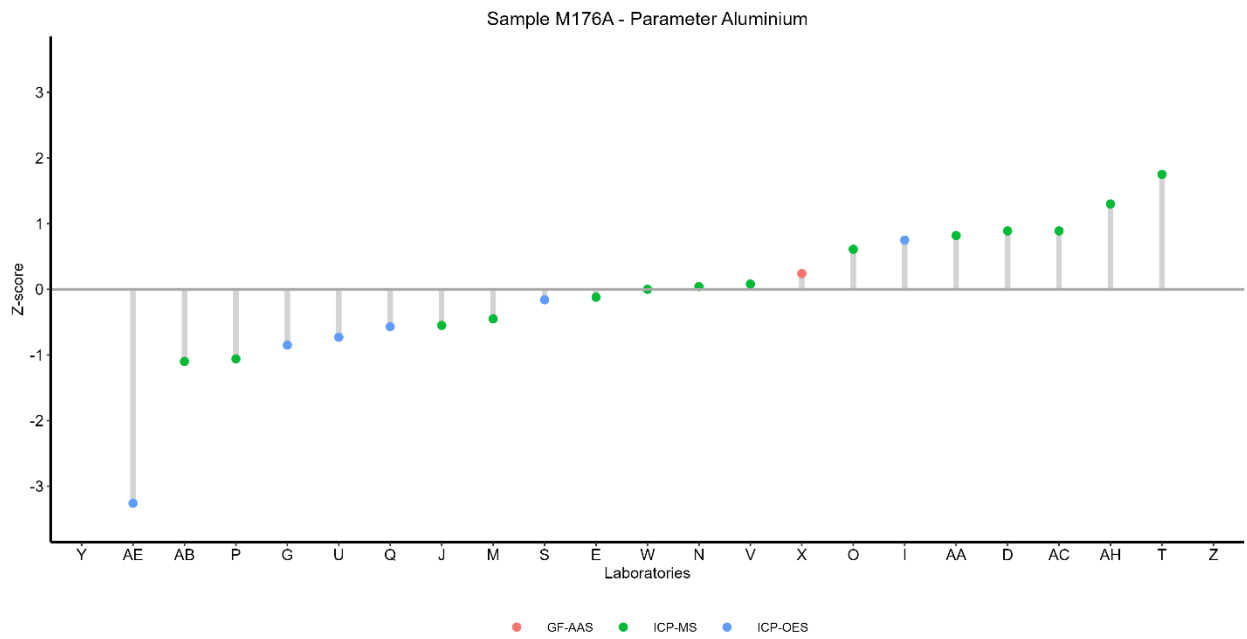
**Methodenvergleich**  
**Method comparison**

Eignungsprüfungsrunde / Proficiency testing round  
M176

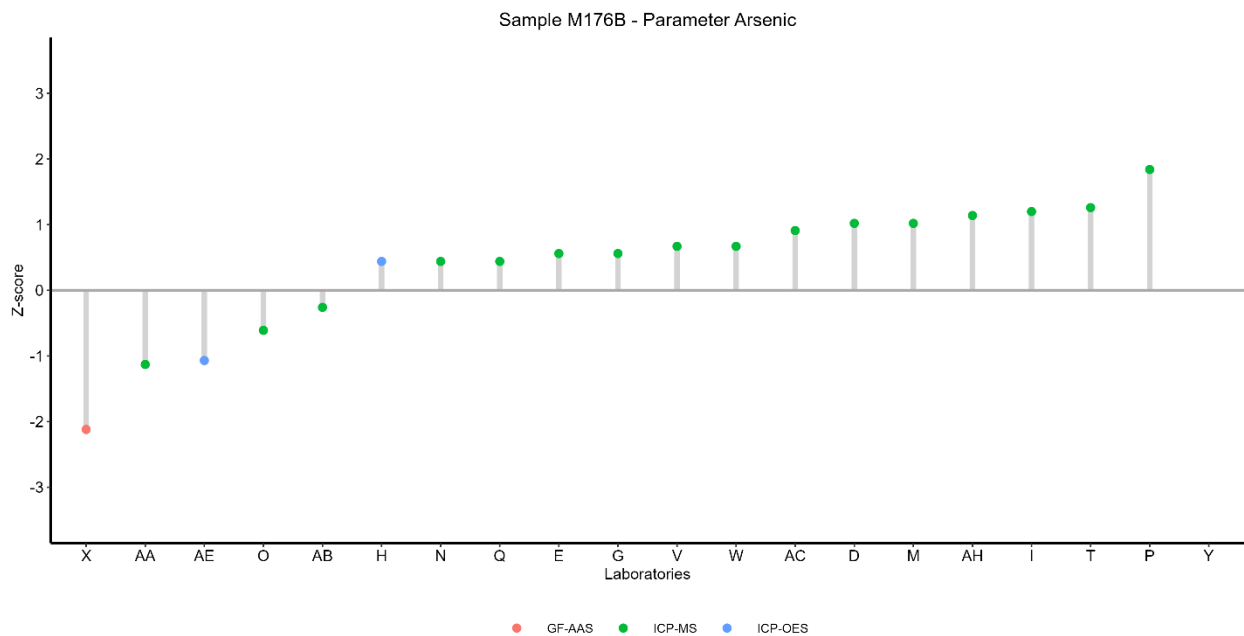
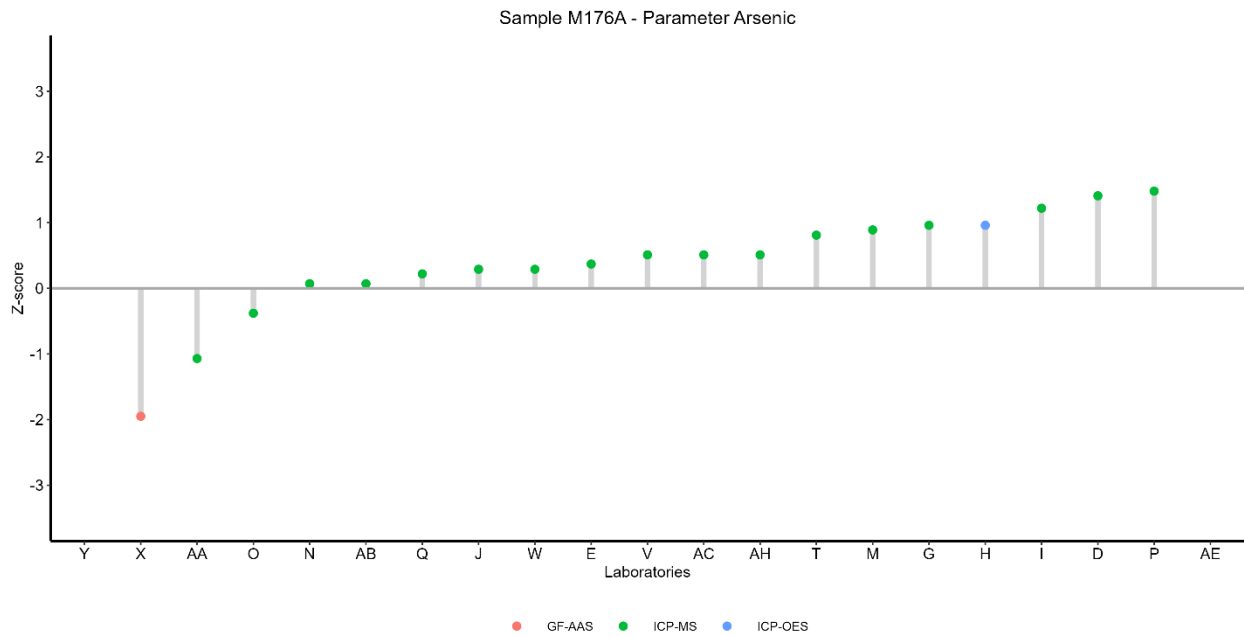
Metalle / Metals

Versand / Dispatch: 03.03.2025

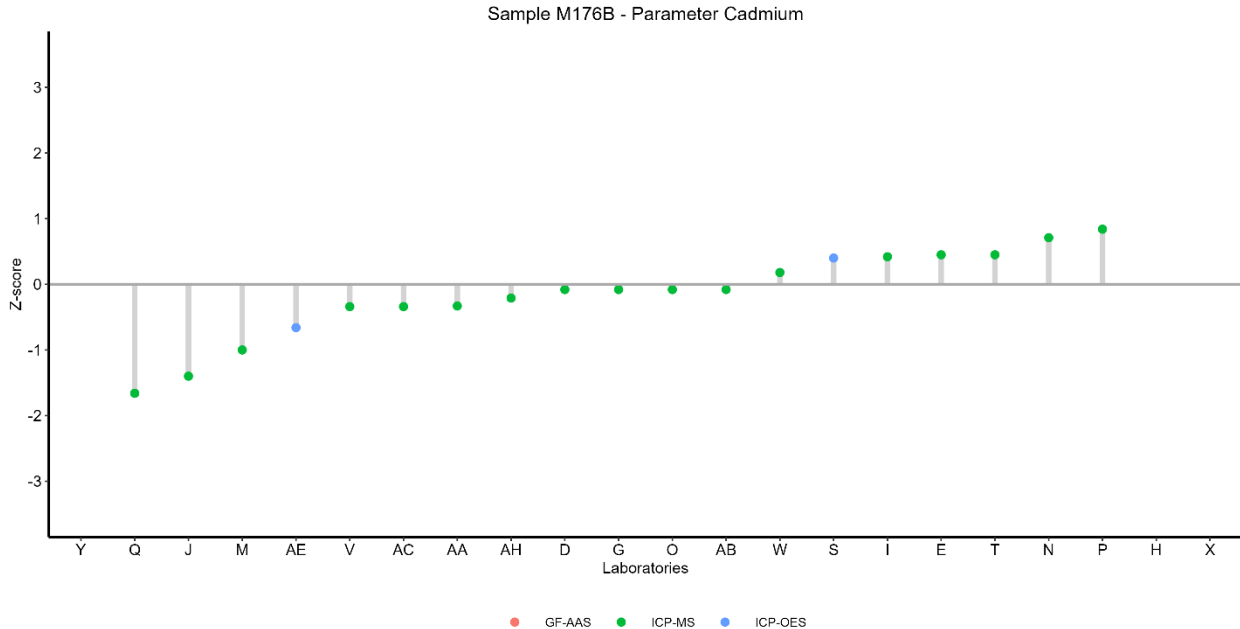
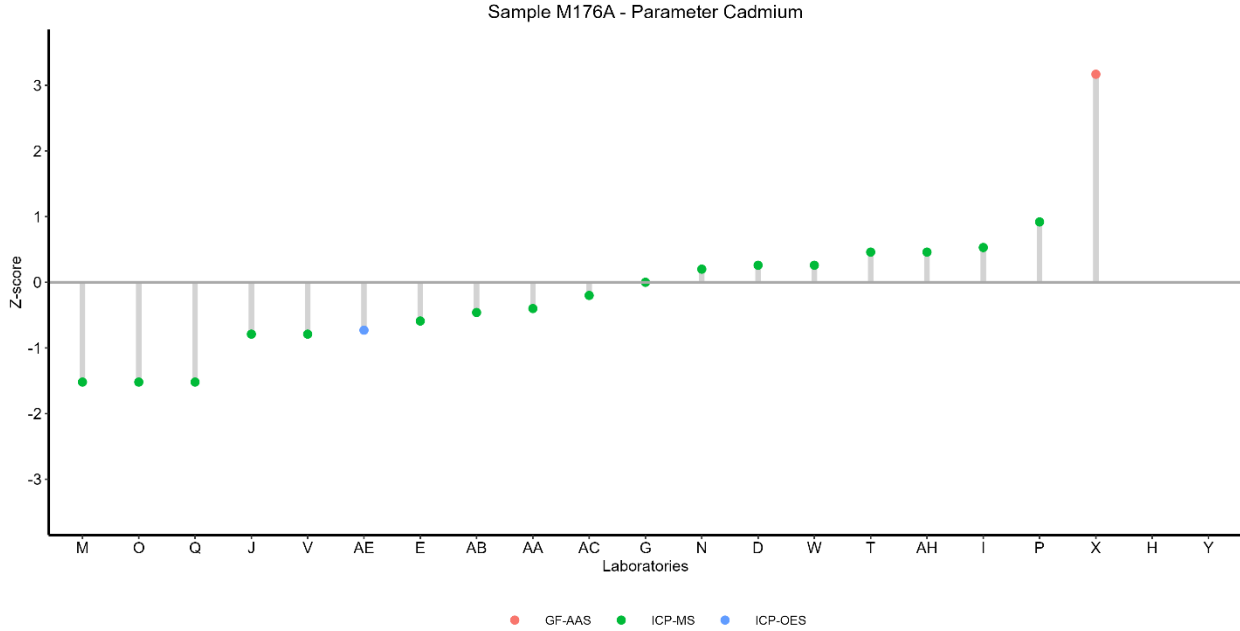
# Aluminium



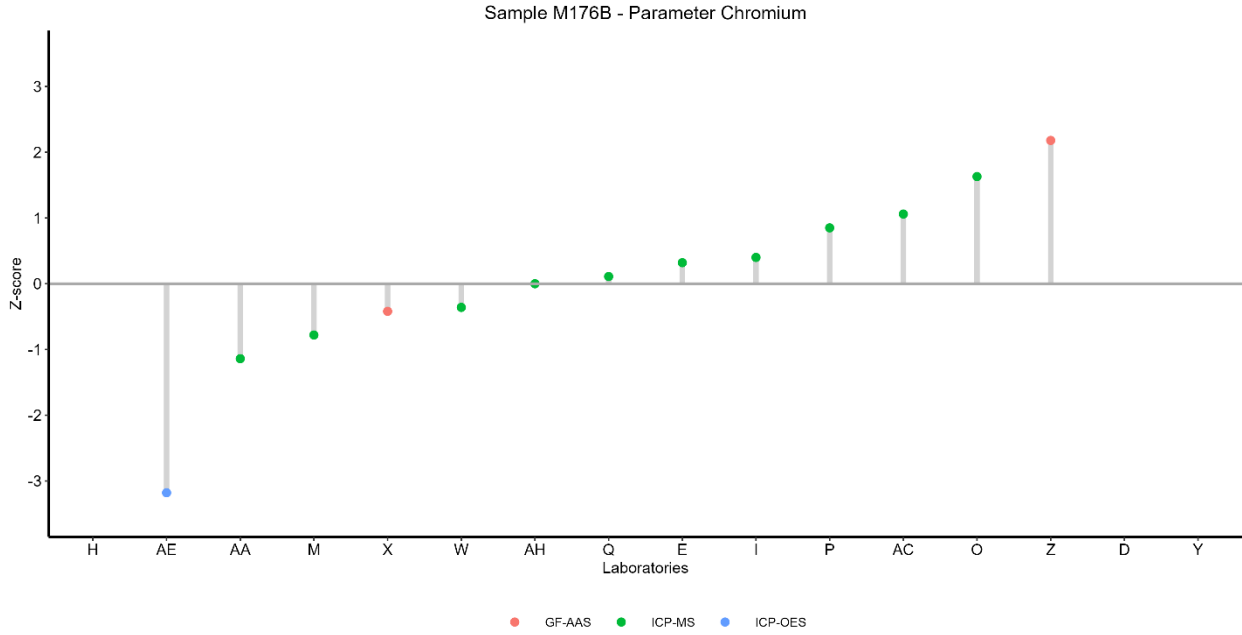
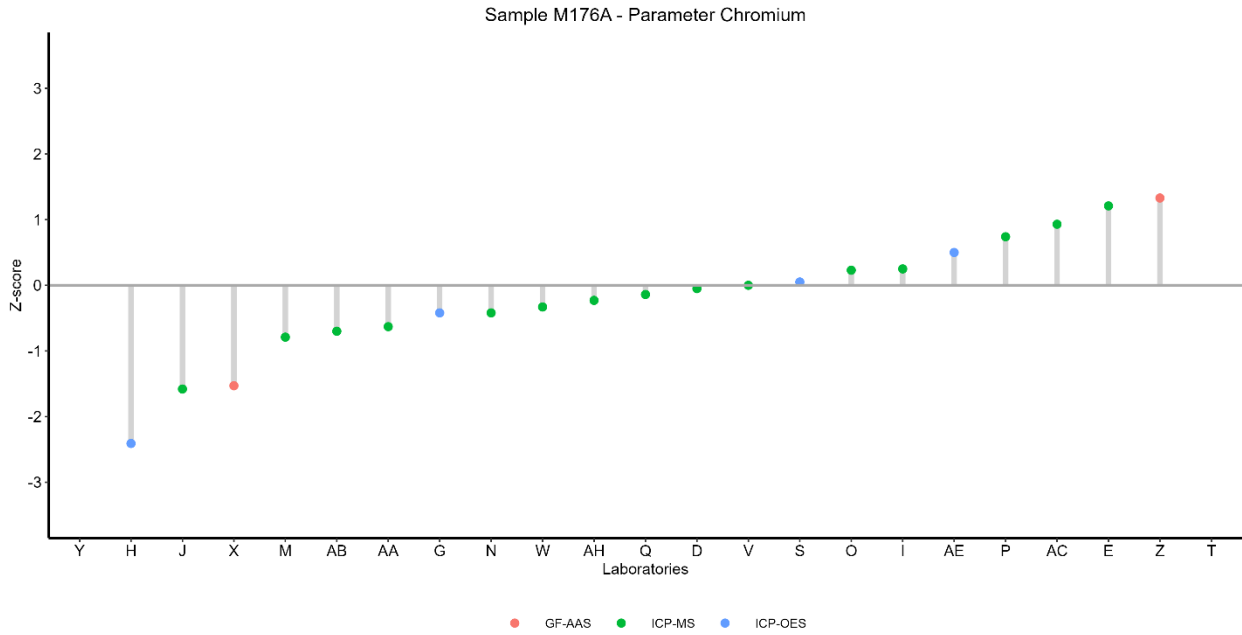
# Arsenic



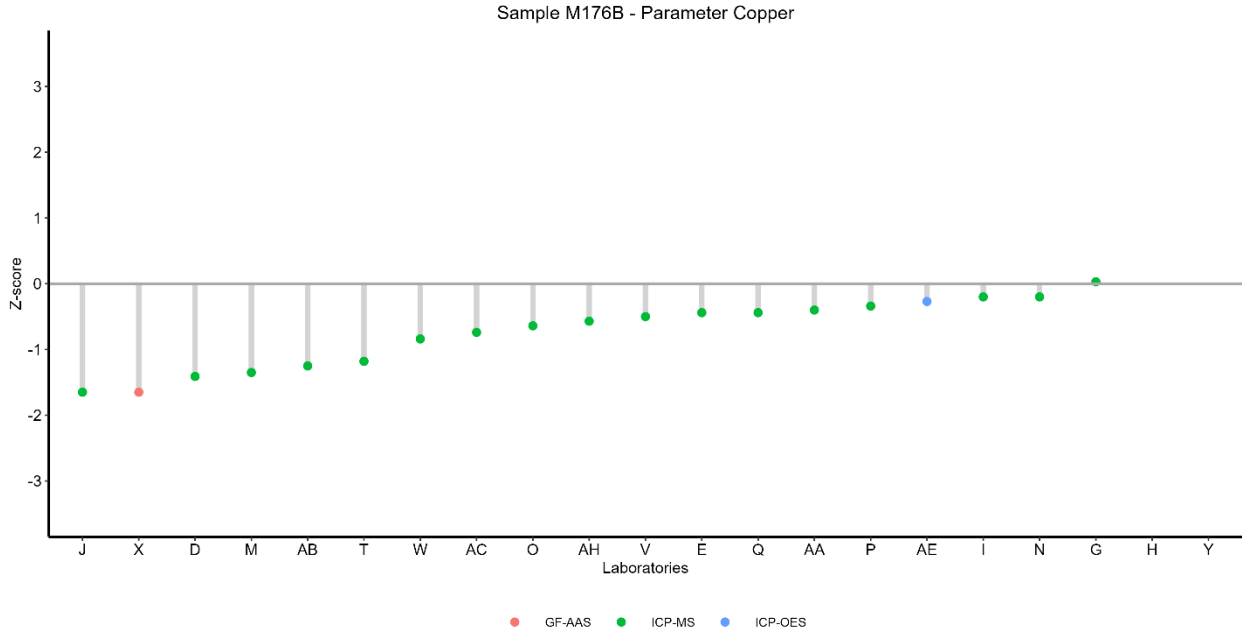
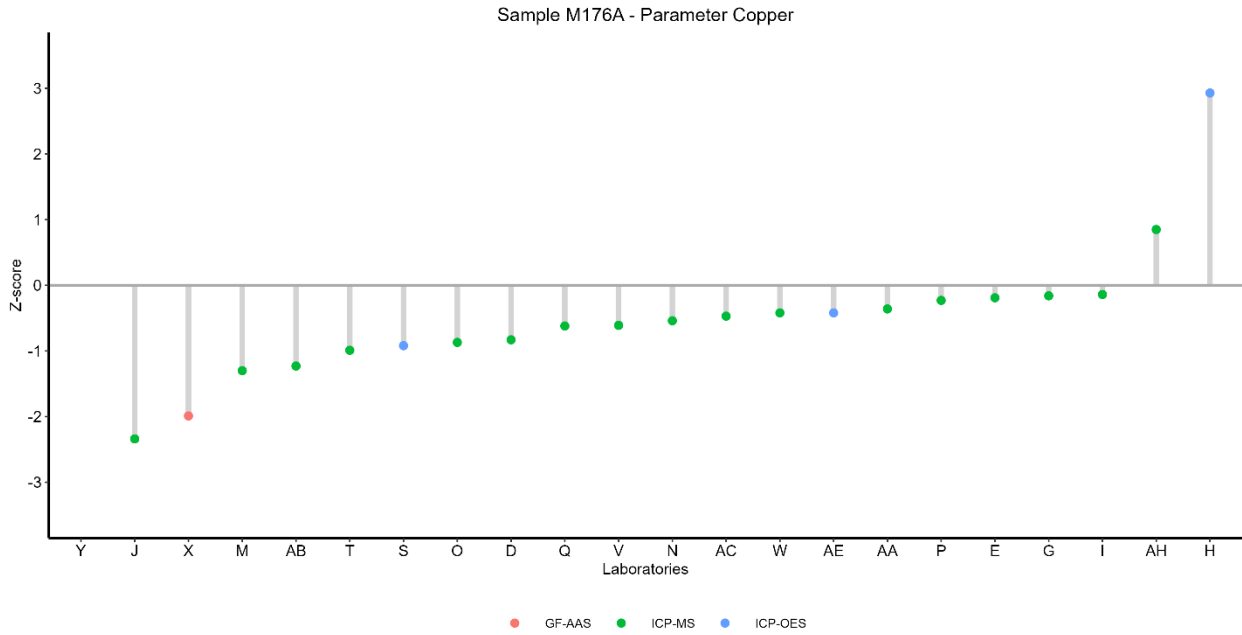
# Cadmium



# Chromium

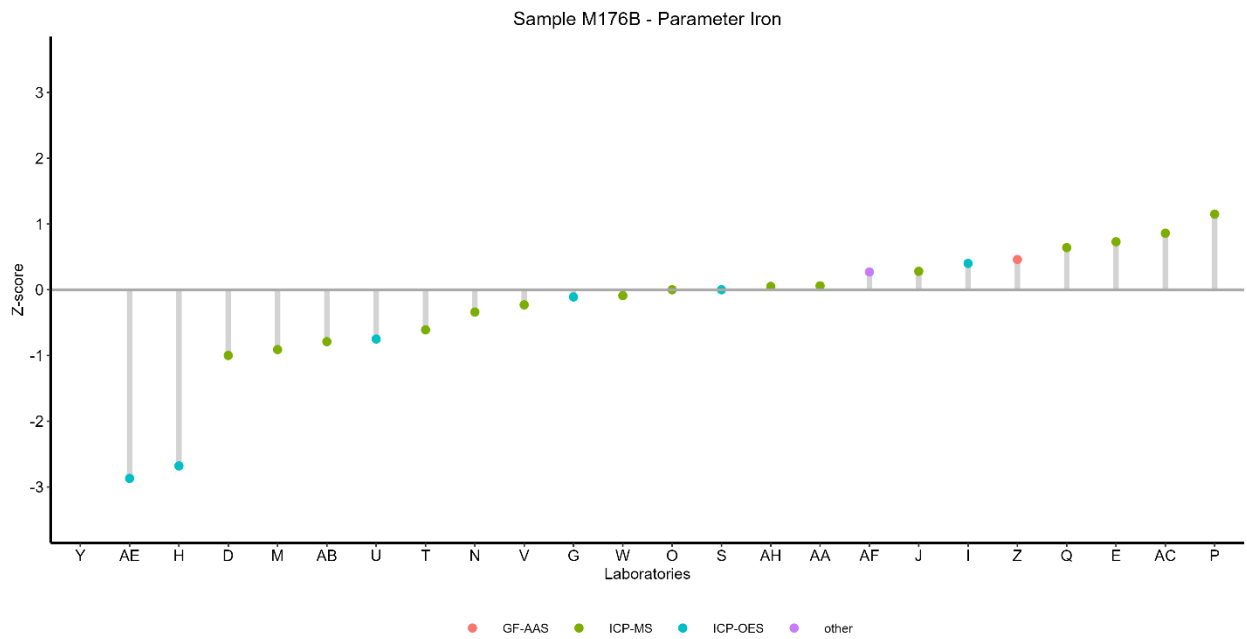
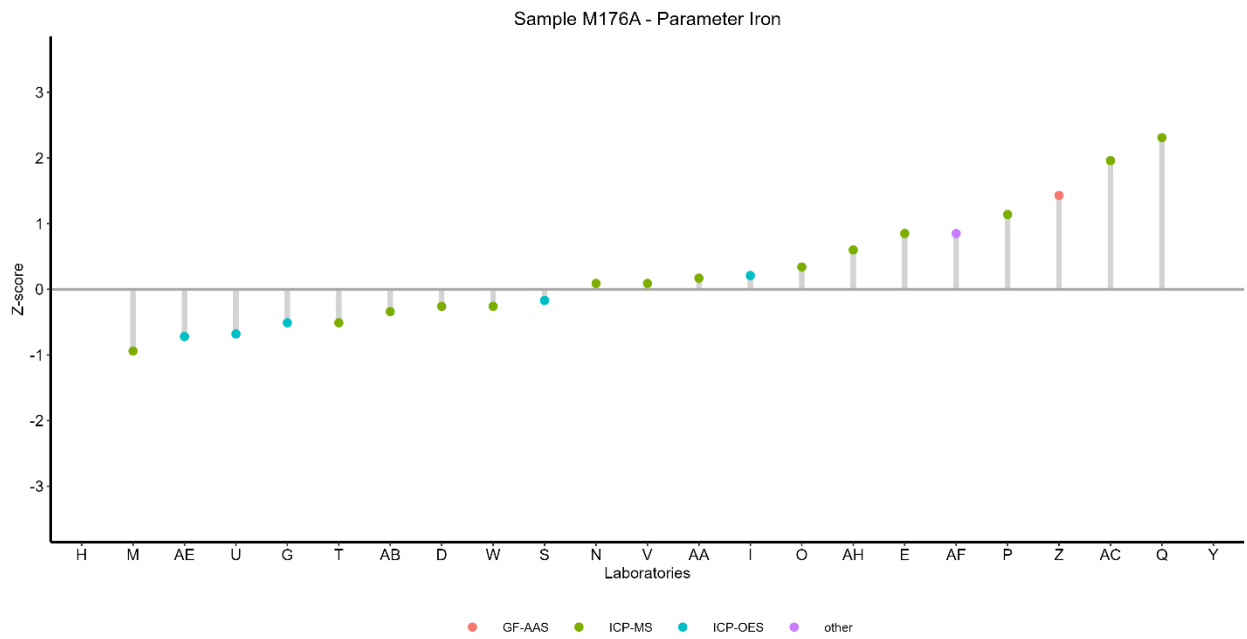


# Copper

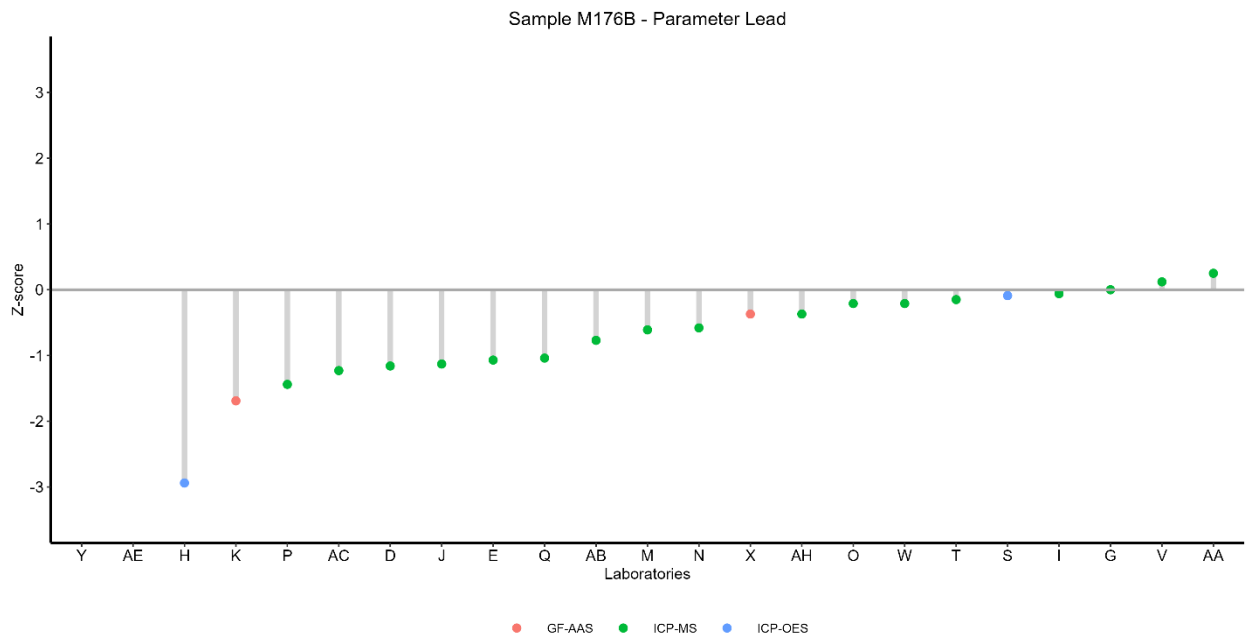
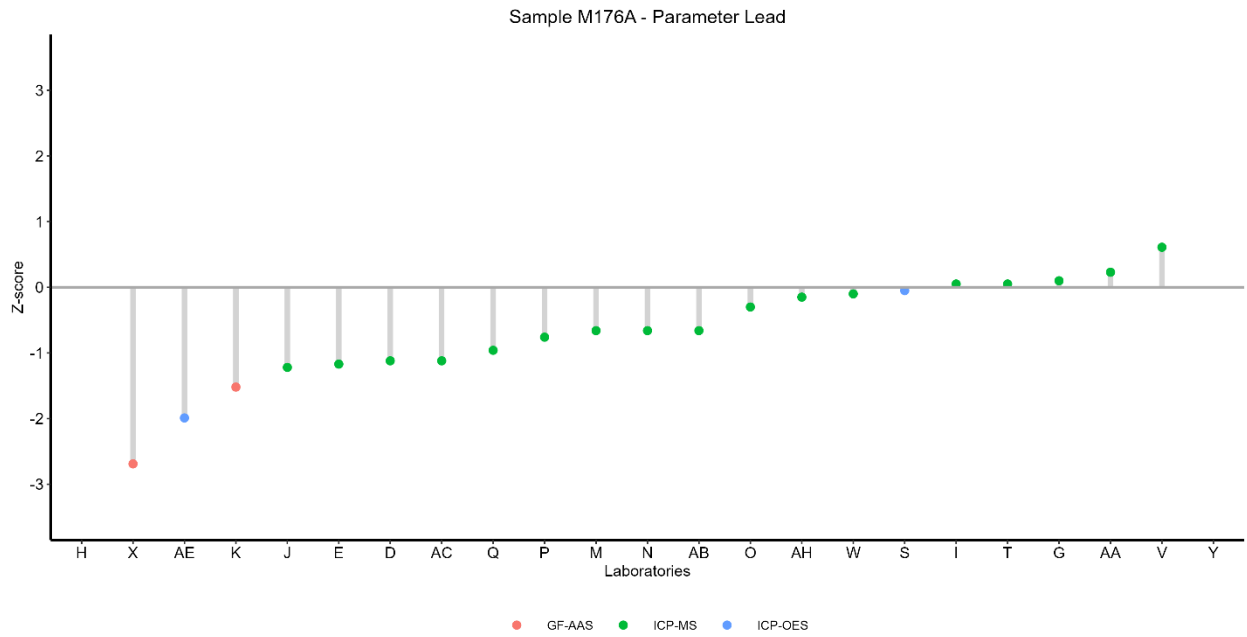




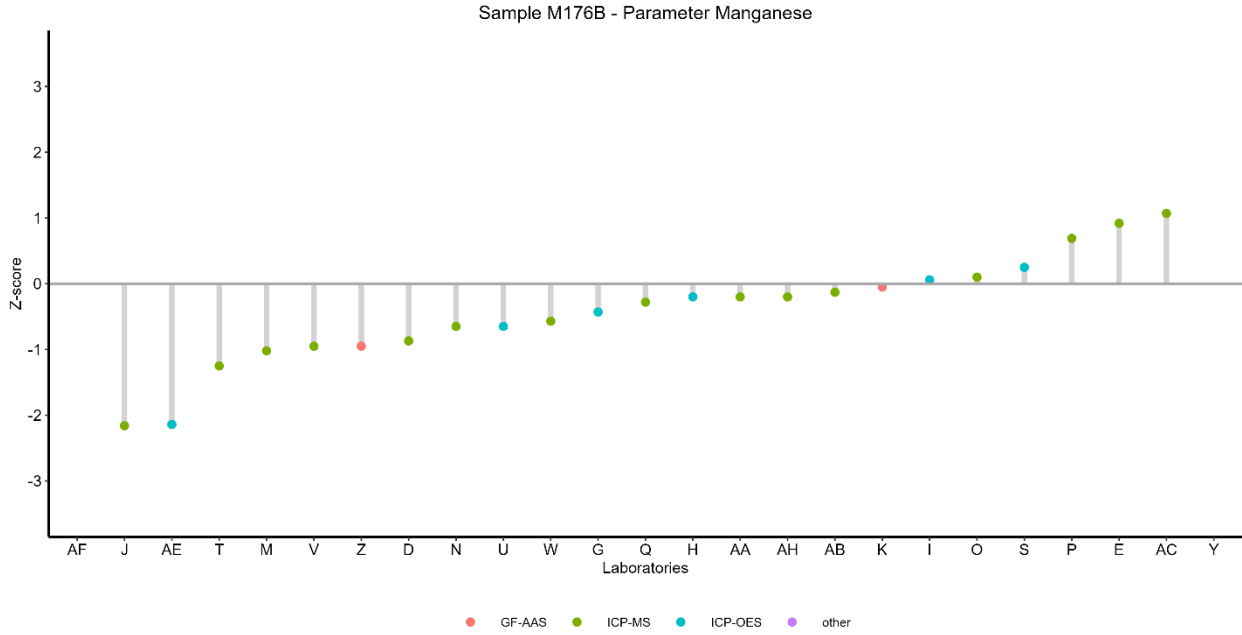
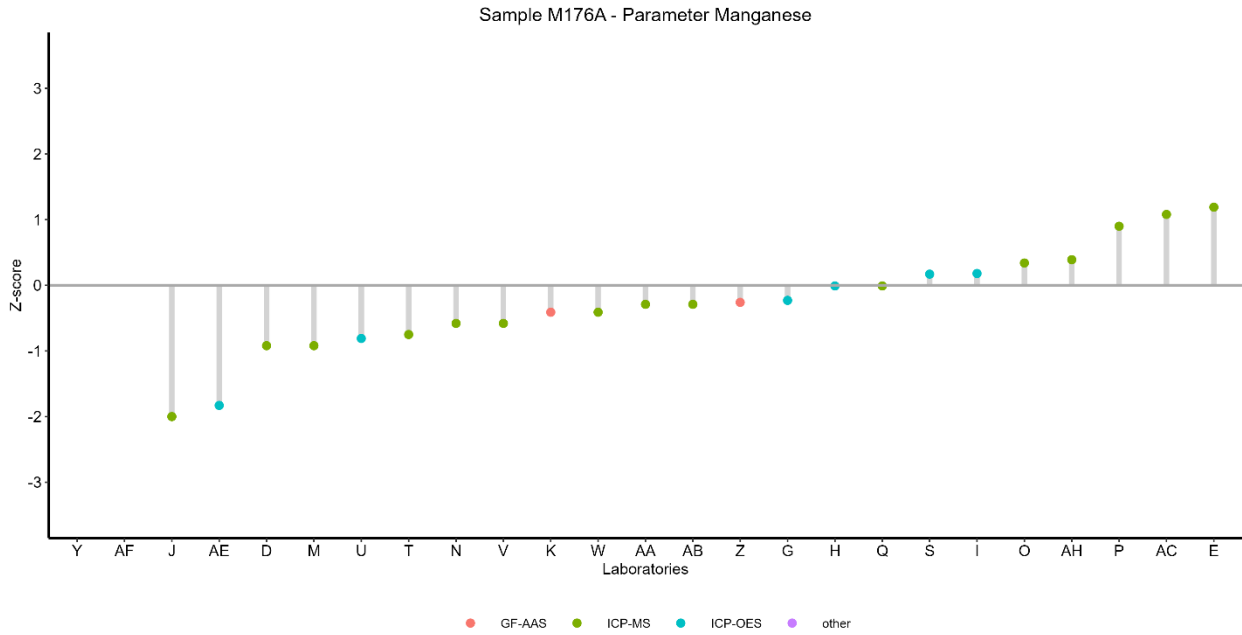
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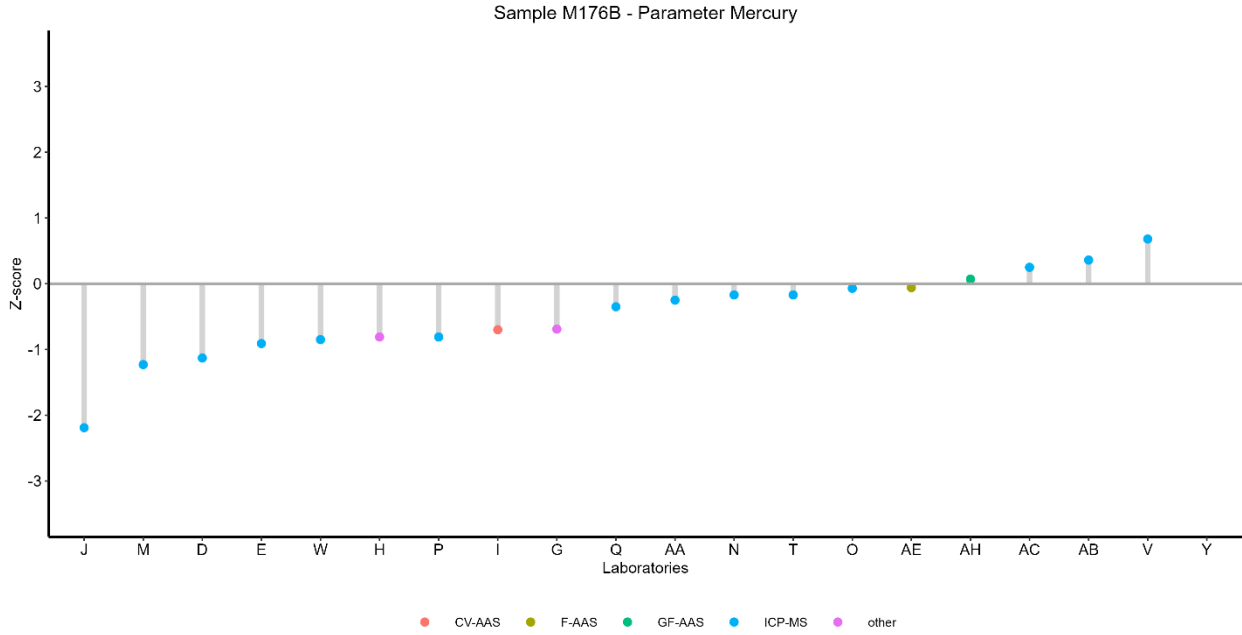
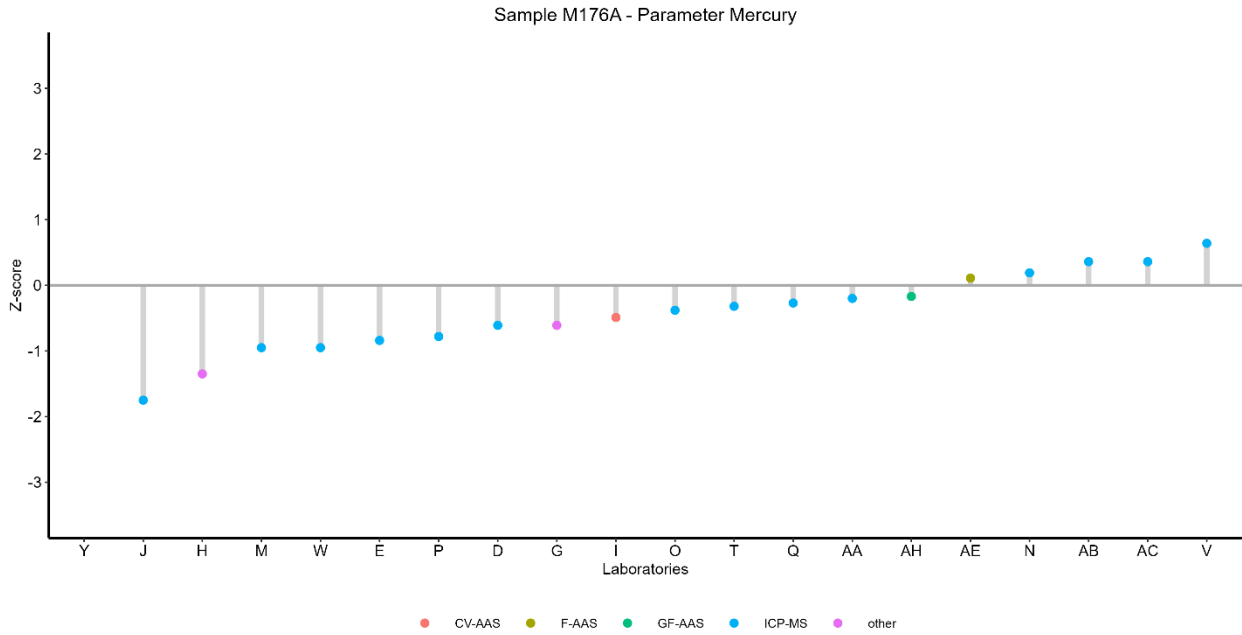
# Lead



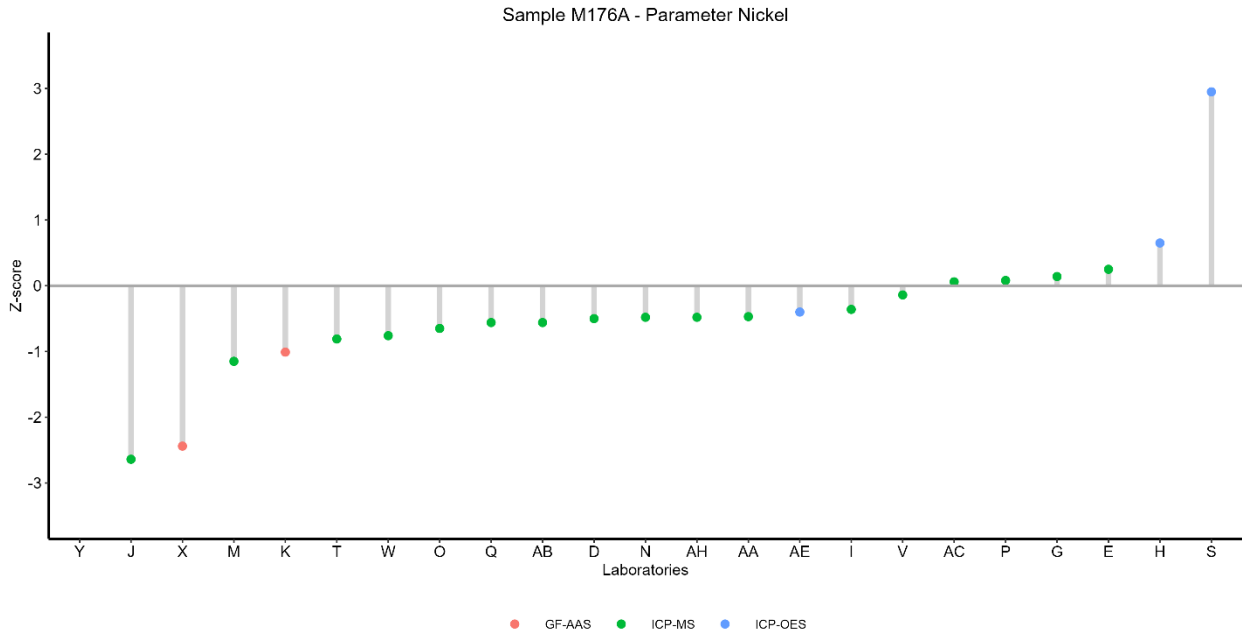
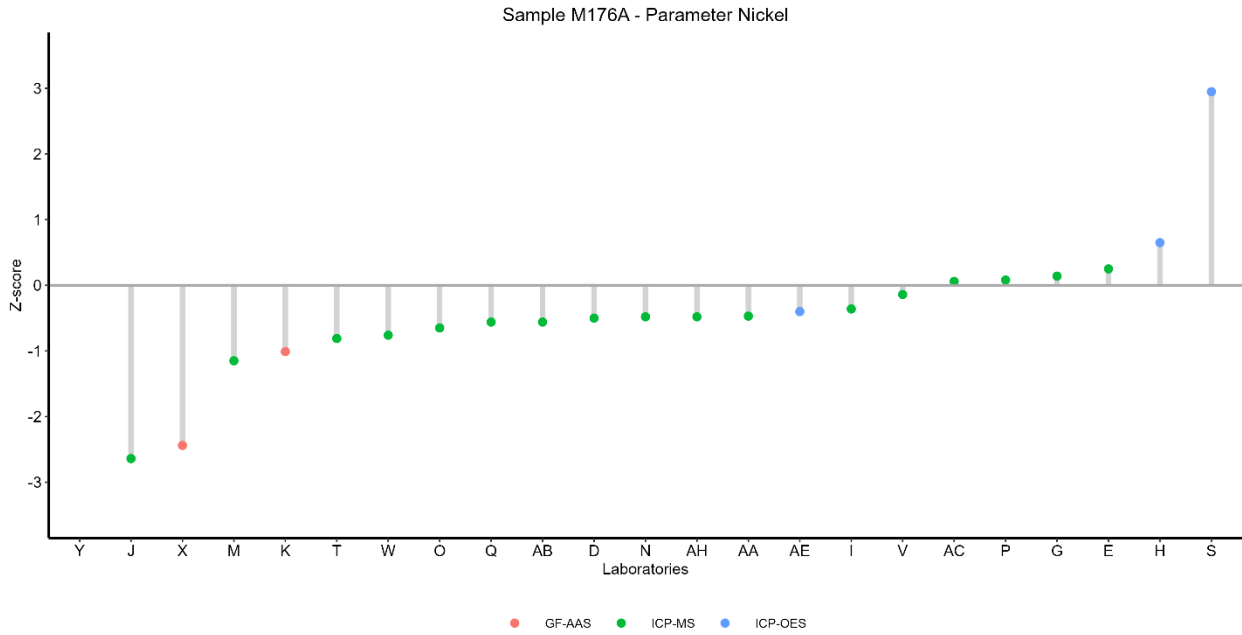
# Manganese



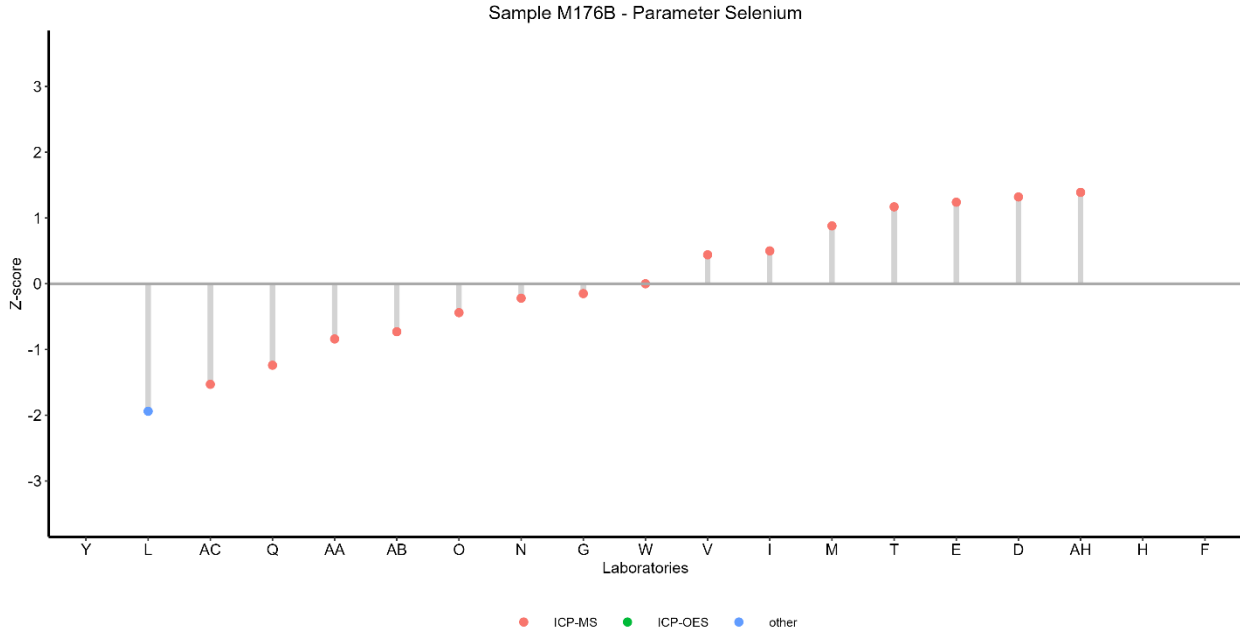
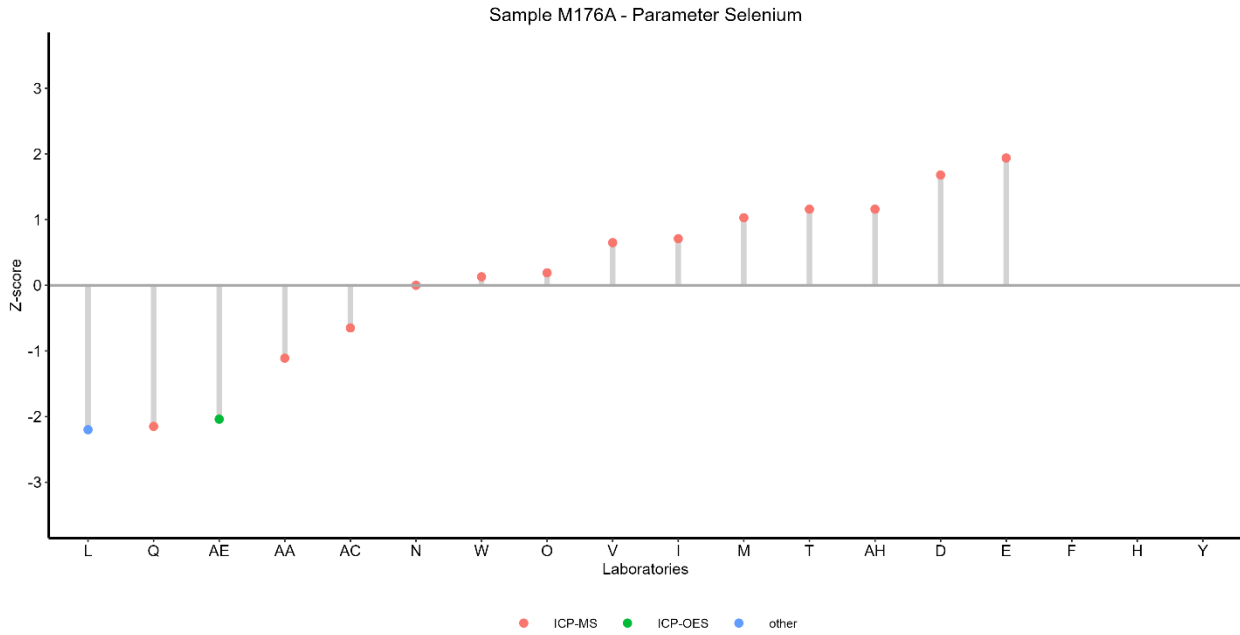
# Mercury



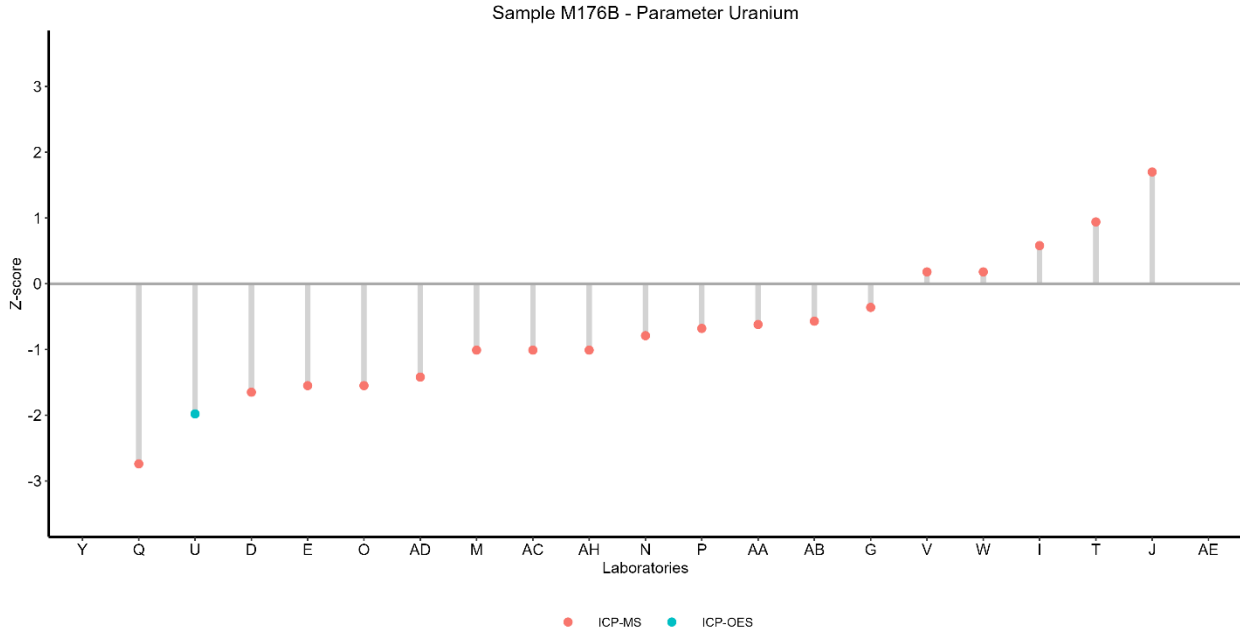
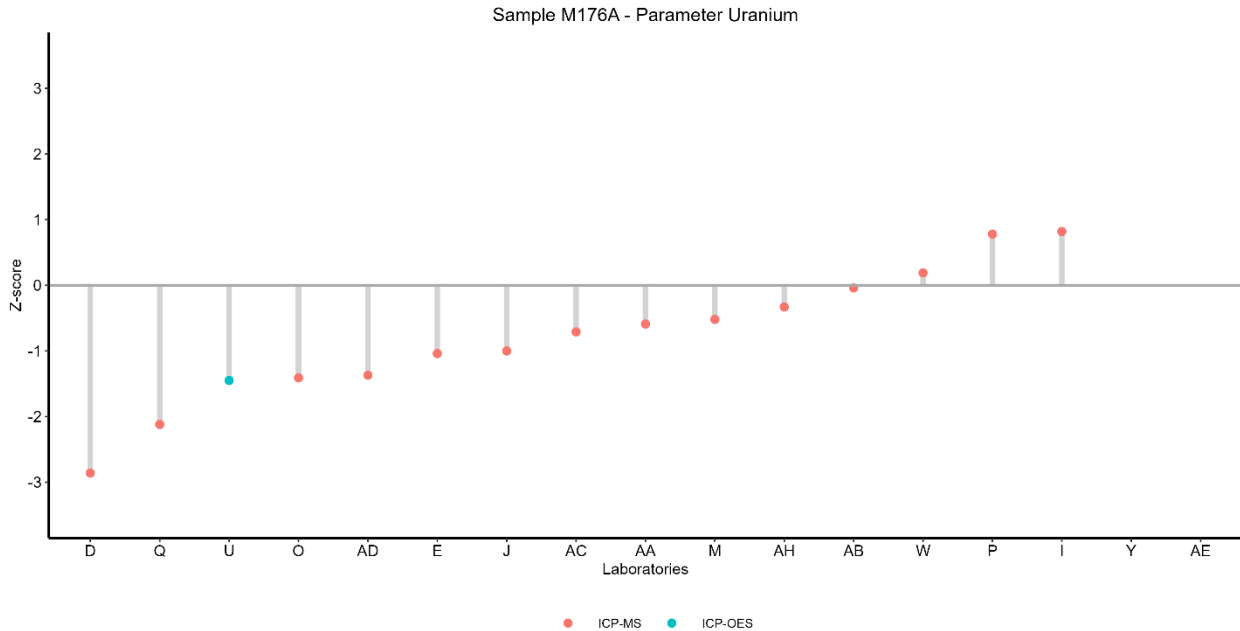
# Nickel



# Selenium



# Uranium



# Zinc

