



21·03·09-NITE-AC-003  
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## Certificate of Accreditation

International Accreditation Japan (IAJapan) hereby accredits the following conformity assessment body as a Reference Material Producer of ASNITE accreditation program.

Accreditation Identification: ASNITE 0001 RMP

Name of Conformity Assessment Body: National Metrology Institute of Japan,  
National Institute of Advanced Industrial Science and Technology

Name of Legal Entity: National Institute of Advanced Industrial Science and Technology

Location of Conformity Assessment Body: 1-1-1 Umezono, Tsukuba-shi, Ibaraki 305-8563, JAPAN

Scope of Accreditation: as the following pages

Accreditation Requirement: ISO 17034:2016\*

\* The relevant accreditation requirements described in the ASNITE-R (NMI) Accreditation Scheme Document are also applied.

Effective Date of Accreditation: 2019-11-01

Expiry Date of Accreditation: 2024-10-31

Date of Initial Accreditation: 2003-10-09

SAKAMOTO Kozo

Chief Executive, International Accreditation Japan (IAJapan)

National Institute of Technology and Evaluation

- International Accreditation Japan (IAJapan) is an RMP accreditation body which has signed MRAs of ILAC (International Laboratory Accreditation Cooperation) and APAC (Asia Pacific Accreditation Cooperation).

- MRA requirements are, in addition to relevant international standards and guides, requirements for participation in proficiency testing programs, surveillance and reassessment, and the policy on the traceability of measurement for MRA purpose.

- This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system in accordance with the recognized International Standard ISO 17034:2016.

- The latest accreditation information is publicly available on IAJapan Website as an accreditation certificate.

Subcategory	Measurand	Measurement Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation	
Standard gases	high purity nitrogen monoxide (NO)	0.99 mol/mol to 0.99993 mol/mol	1.0 % to 0.01 % (relative)	• Subtraction method	2019-11-01 *2021-09-29	
	impurities in NO	NO <sub>2</sub>	10 µmol/mol to 10000 µmol/mol	10 % to 2.5 % (relative)		• FT-IR
		N <sub>2</sub>	11 µmol/mol to 5000 µmol/mol	100 % to 2.5 % (relative)		• GC-TCD
		O <sub>2</sub>	11 µmol/mol to 5000 µmol/mol	100 % to 2.5 % (relative)		• GC-TCD
		N <sub>2</sub> O	7.5 µmol/mol to 11000 µmol/mol	10 % to 0.5 % (relative)		• FT-IR • GC-TCD
		CH <sub>4</sub>	2 µmol/mol to 11000 µmol/mol	100 % to 2.5 % (relative)		• GC-FID
		C <sub>3</sub> H <sub>8</sub>	2 µmol/mol to 11000 µmol/mol	100 % to 2.5 % (relative)		• GC-FID
		H <sub>2</sub> O*	21 µmol/mol to 100 µmol/mol	100 % to 0.5% (relative)		• FT-IR
		CO <sub>2</sub> *	10 µmol/mol to 100 µmol/mol	100 % to 0.5% (relative)		• FT-IR
	high purity sulfur dioxide (SO <sub>2</sub> )	0.99 mol/mol to 0.99997 mol/mol	1.0 % to 0.01 % (relative)	• Subtraction method		
	impurities in SO <sub>2</sub>	CO <sub>2</sub>	1 µmol/mol to 15000 µmol/mol	100 % to 0.5 % (relative)		• GC-TCD or • FT-IR
		N <sub>2</sub>	1 µmol/mol to 15000 µmol/mol	100 % to 0.5 % (relative)		• GC-TCD
		O <sub>2</sub>	1 µmol/mol to 15000 µmol/mol	100 % to 0.5 % (relative)		• GC-TCD
		CH <sub>4</sub>	0.09 µmol/mol to 11000 µmol/mol	100 % to 0.5 % (relative)		• GC-FID
		C <sub>3</sub> H <sub>8</sub>	0.04 µmol/mol to 11000 µmol/mol	100 % to 0.5 % (relative)		• GC-FID
		H <sub>2</sub> O*	24 µmol/mol to 100 µmol/mol	100 % to 0.5 % (relative)		• FT-IR
	high purity methane (CH <sub>4</sub> )	0.99 mol/mol to 0.9999995 mol/mol	1 mmol/mol to 0.0005 mmol/mol	• Subtracting method		
	impurities in CH <sub>4</sub>	N <sub>2</sub>	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-PID or • GC-TCD
		O <sub>2</sub>	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-PID or • GC-TCD
		Ar	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-PID or • GC-TCD
CO		0.04 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)	• GC-PID or • GC-TCD		
CO <sub>2</sub>		0.04 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)	• GC-PID or • GC-TCD		
C <sub>2</sub> H <sub>6</sub>		0.01 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)	• GC-FID		
H <sub>2</sub>		0.07 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)	• GC-PID or • GC-TCD		
hexane		0.01 µmol/mol to 180 µmol/mol	100 % to 0.6 % (relative)	• GC-FID		
H <sub>2</sub> O		0.1 µmol/mol to 130 µmol/mol	70 % to 5 % (relative)	• Dew point measuring method		

Subcategory	Measurand		Measurement Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Standard gases	high purity propane (C <sub>3</sub> H <sub>8</sub> )		0.99 mol/mol to 0.999998 mol/mol	1 mmol/mol to 0.001 mmol/mol	• Subtracting method	2019-11-01
	impurities in C <sub>3</sub> H <sub>8</sub>	N <sub>2</sub>	0.1 μmol/mol to 100 μmol/mol	30 % to 2 % (relative)	• GC-TCD	
		O <sub>2</sub>	0.1 μmol/mol to 100 μmol/mol	30 % to 2 % (relative)	• GC-TCD	
		Ar	0.1 μmol/mol to 100 μmol/mol	30 % to 2 % (relative)	• GC-TCD	
		CO <sub>2</sub>	0.1 μmol/mol to 100 μmol/mol	30 % to 2 % (relative)	• GC-TCD	
		CH <sub>4</sub>	0.1 μmol/mol to 100 μmol/mol	30 % to 2 % (relative)	• GC-FID	
		C <sub>2</sub> H <sub>6</sub>	0.1 μmol/mol to 100 μmol/mol	30 % to 2 % (relative)	• GC-FID	
		propylene	0.1 μmol/mol to 100 μmol/mol	30 % to 2 % (relative)	• GC-FID	
		butane	0.1 μmol/mol to 100 μmol/mol	30 % to 2 % (relative)	• GC-FID	
		isobutane	0.1 μmol/mol to 100 μmol/mol	30 % to 2 % (relative)	• GC-FID	
		H <sub>2</sub> O	0.5 μmol/mol to 1000 μmol/mol	70 % to 20 % (relative)	• Dew point measuring method	
	high purity carbon dioxide (CO <sub>2</sub> )		0.99 mol/mol to 0.999998 mol/mol	1 mmol/mol to 0.002 mmol/mol	• Subtracting method	
	impurities in CO <sub>2</sub>	N <sub>2</sub>	0.1 μmol/mol to 100 μmol/mol	100 % to 0.5 % (relative)	• GC-TCD	
		O <sub>2</sub>	0.1 μmol/mol to 100 μmol/mol	100 % to 0.5 % (relative)	• GC-TCD	
		H <sub>2</sub>	0.8 μmol/mol to 100 μmol/mol	100 % to 0.5 % (relative)	• GC-TCD	
		He	0.8 μmol/mol to 100 μmol/mol	100 % to 0.5 % (relative)	• GC-TCD	
		CH <sub>4</sub>	0.004 μmol/mol to 1 μmol/mol	100 % to 1 % (relative)	• GC-FID	
		C <sub>3</sub> H <sub>8</sub>	0.004 μmol/mol to 1 μmol/mol	100 % to 1 % (relative)	• GC-FID	
		CO	0.05 μmol/mol to 1 μmol/mol	100 % to 0.5 % (relative)	• GC-FID	
		H <sub>2</sub> O	0.5 μmol/mol to 130 μmol/mol	100 % to 30 % (relative)	• Capacitance-type moisture analyzer	
	high purity carbon monoxide (CO)		0.99 mol/mol to 0.99993 mol/mol	1 mmol/mol to 0.02 mmol/mol	• Subtracting method	
	impurities in CO	N <sub>2</sub>	1.5 μmol/mol to 100 μmol/mol	100 % to 0.5 % (relative)	• GC-TCD	
		O <sub>2</sub>	2.1 μmol/mol to 100 μmol/mol	100 % to 0.5 % (relative)	• GC-TCD	
H <sub>2</sub>		0.9 μmol/mol to 100 μmol/mol	100 % to 0.5 % (relative)	• GC-TCD		
He		0.4 μmol/mol to 100 μmol/mol	100 % to 0.5 % (relative)	• GC-TCD		
CH <sub>4</sub>		1.5 μmol/mol to 100 μmol/mol	100 % to 0.5 % (relative)	• GC-TCD		
CO <sub>2</sub>		0.3 μmol/mol to 100 μmol/mol	100 % to 0.5 % (relative)	• GC-TCD		
H <sub>2</sub> O		0.36 μmol/mol to 100 μmol/mol	100 % to 0.5 % (relative)	• Quartz-crystal oscillator sample cell		

Subcategory	Measurand	Measurement Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation	
Standard gases	high purity oxygen (O <sub>2</sub> )	0.99 mol/mol to 1 mol/mol	1 mmol/mol to 0.0005 mmol/mol	• Subtracting method or • Magnetopneumatic oxygen analyzer	2019-11-01	
	impurities in O <sub>2</sub>	Ar	1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		N <sub>2</sub>	1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		CH <sub>4</sub>	0.05 µmol/mol to 1 µmol/mol	30 % to 5 % (relative)		• FT-IR
		CO	0.06 µmol/mol to 1 µmol/mol	30 % to 5 % (relative)		• FT-IR
		CO <sub>2</sub>	0.05 µmol/mol to 1 µmol/mol	30 % to 5 % (relative)		• FT-IR
		N <sub>2</sub> O	0.05 µmol/mol to 1 µmol/mol	30 % to 5 % (relative)		• FT-IR
		H <sub>2</sub> O	0.5 µmol/mol to 130 µmol/mol	70 % to 30 % (relative)		• Dew point measuring method
	high purity vinyl chloride	0.99 mol/mol to 0.99999 mol/mol	5 mmol/mol to 0.01 mmol/mol	• Subtracting method		
	impurities in vinyl chloride	N <sub>2</sub>	1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		O <sub>2</sub>	1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		Ar	1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		CH <sub>4</sub>	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-FID
		CO <sub>2</sub>	1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		methyl chloride	1 µmol/mol to 200 µmol/mol	30 % to 2 % (relative)		• GC-FID
		ethyl chloride	1 µmol/mol to 100 µmol/mol	20 % to 2 % (relative)		• GC-FID
		acetylene	1 µmol/mol to 100 µmol/mol	20 % to 2 % (relative)		• GC-FID
		H <sub>2</sub> O	0.5 µmol/mol to 1000 µmol/mol	70 % to 20 % (relative)		• Dew point measuring method
	high purity 1,3-butadiene	0.98 mol/mol to 0.99996 mol/mol	20 mmol/mol to 1 mmol/mol	• Subtracting method		
	impurities in 1,3-butadiene	N <sub>2</sub>	5 µmol/mol to 1000 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		O <sub>2</sub>	5 µmol/mol to 1000 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		Ar	5 µmol/mol to 1000 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		CO <sub>2</sub>	5 µmol/mol to 1000 µmol/mol	30 % to 2 % (relative)		• GC-TCD
butane		1 µmol/mol to 500 µmol/mol	20 % to 2 % (relative)	• GC-FID		
isobutane		1 µmol/mol to 500 µmol/mol	20 % to 2 % (relative)	• GC-FID		
1-butene		1 µmol/mol to 1000 µmol/mol	20 % to 2 % (relative)	• GC-FID		
<i>trans</i> -2-butene		1 µmol/mol to 7000 µmol/mol	20 % to 2 % (relative)	• GC-FID		
<i>cis</i> -2-butene		1 µmol/mol to 8000 µmol/mol	20 % to 2 % (relative)	• GC-FID		
isobutylene		1 µmol/mol to 1000 µmol/mol	20 % to 2 % (relative)	• GC-FID		
4-vinyl-1- cyclohexene (1,3-butadiene dimer)		1 µmol/mol to 2150 µmol/mol	60 % to 30 % (relative)	• GC-FID		
H <sub>2</sub> O		0.5 µmol/mol to 1000 µmol/mol	70 % to 20 % (relative)	• Dew point measuring method		

Subcategory	Measurand	Measurement Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation	
Standard gases	high purity ethane*	0.99 mol/mol to 0.99999 mol/mol	1 mmol/mol to 0.001 mmol/mol	• Subtracting method	*2021-09-29	
	impurities in ethane*	N <sub>2</sub>	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		O <sub>2</sub>	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		CO <sub>2</sub>	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		methane	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-FID
		ethylene	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-FID
		propane	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-FID
		propylene	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-FID
		butane	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-FID
		H <sub>2</sub> O	10 µmol/mol to 1000 µmol/mol	70 % to 20 % (relative)		• Dew point measuring method
	high purity isobutane*	0.99 mol/mol to 0.99995 mol/mol	2 mmol/mol to 0.005 mmol/mol	• Subtracting method		
	impurities in isobutane*	N <sub>2</sub>	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		O <sub>2</sub>	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		CO <sub>2</sub>	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		propane	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-FID
		butane	0.1 µmol/mol to 200 µmol/mol	30 % to 2 % (relative)		• GC-FID
		isobutene	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-FID
		<i>cis</i> -2-butene	0.1 µmol/mol to 500 µmol/mol	30 % to 2 % (relative)		• GC-FID
		<i>trans</i> -2-butene	0.1 µmol/mol to 500 µmol/mol	30 % to 2 % (relative)		• GC-FID
		pentane	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-FID
		H <sub>2</sub> O	50 µmol/mol to 3000 µmol/mol	70 % to 10 % (relative)		• Dew point measuring method
	high purity butane*	0.99 mol/mol to 0.99995 mol/mol	2 mmol/mol to 0.005 mmol/mol	• Subtracting method		
	impurities in butane*	N <sub>2</sub>	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		O <sub>2</sub>	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		CO <sub>2</sub>	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-TCD
		propane	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)		• GC-FID
		isobutane	0.1 µmol/mol to 200 µmol/mol	30 % to 2 % (relative)		• GC-FID
isobutene		0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)	• GC-FID		
<i>cis</i> -2-butene		0.1 µmol/mol to 500 µmol/mol	30 % to 2 % (relative)	• GC-FID		
<i>trans</i> -2-butene		0.1 µmol/mol to 500 µmol/mol	30 % to 2 % (relative)	• GC-FID		
pentane		0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)	• GC-FID		
H <sub>2</sub> O		50 µmol/mol to 3000 µmol/mol	70 % to 10 % (relative)	• Dew point measuring method		

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation	
Standard gases	high purity isopentane*	0.99 mol/mol to 1 mol/mol	5 mmol/mol to 0.01 mmol/mol	• Post-column reaction gas chromatography	2019-11-01 *2021-09-29	
	high purity pentane*	0.99 mol/mol to 1 mol/mol	5 mmol/mol to 0.01 mmol/mol	• Post-column reaction gas chromatography		
	nitrogen*	0.999 mol/mol to 0.999998 mol/mol	1 mmol/mol to 0.004 mmol/mol	• Subtracting method		
	impurities in nitrogen*	O <sub>2</sub> + Ar	1 µmol/mol to 10 µmol/mol	100 % to 30 % (relative)		• GC-TCD
		carbon dioxide	0.1 µmol/mol to 10 µmol/mol	100 % to 30 % (relative)		• GC-FID
		total hydro carbons	0.005 µmol/mol to 10 µmol/mol	100 % to 30 % (relative)		• Total hydrocarbon analyzer
		H <sub>2</sub> O	1.4 µmol/mol to 10 µmol/mol	100 % to 30 % (relative)		• Dew point measuring method
		O <sub>2</sub> /N <sub>2</sub>	5 µmol/mol to 5 mmol/mol	1 % to 0.1 % (relative)		• GC-TCD
		N <sub>2</sub> O/N <sub>2</sub> or N <sub>2</sub> O/air	0.2 µmol/mol to 0.02 mol/mol	0.2 % to 0.1 % (relative)		• GC-TCD or • GC-ECD
		hexane/N <sub>2</sub>	20 µmol/mol to 600 µmol/mol	2 % to 0.3 % (relative)		• GC-FID
		hexane/CH <sub>4</sub>	20 µmol/mol to 600 µmol/mol	2 % to 0.3 % (relative)		• GC-FID
		N <sub>2</sub> +CO <sub>2</sub> +C <sub>3</sub> H <sub>8</sub> /CH <sub>4</sub>	N <sub>2</sub> : 0.005 mol/mol to 0.02 mol/mol CO <sub>2</sub> : 0.005 mol/mol to 0.02 mol/mol C <sub>3</sub> H <sub>8</sub> : 0.02 mol/mol to 0.1 mol/mol	N <sub>2</sub> : 0.2 mmol/mol CO <sub>2</sub> : 0.1 mmol/mol C <sub>3</sub> H <sub>8</sub> : 0.3 mmol/mol		N <sub>2</sub> : • GC-TCD CO <sub>2</sub> : • GC-TCD C <sub>3</sub> H <sub>8</sub> : • GC-TCD or • GC-FID
		synthetic natural gas	N <sub>2</sub> : 5 mmol/mol to 200 mmol/mol CO <sub>2</sub> : 5 mmol/mol to 100 mmol/mol C <sub>2</sub> H <sub>6</sub> : 2 mmol/mol to 200 mmol/mol C <sub>3</sub> H <sub>8</sub> : 1 mmol/mol to 100 mmol/mol <i>n</i> -C <sub>4</sub> H <sub>10</sub> : 0.5 mmol/mol to 10 mmol/mol <i>iso</i> -C <sub>4</sub> H <sub>10</sub> : 0.5 mmol/mol to 10 mmol/mol CH <sub>4</sub> : 600 mmol/mol to 980 mmol/mol	N <sub>2</sub> : 0.5 % to 0.3 % (relative) CO <sub>2</sub> : 0.6 % to 0.4 % (relative) C <sub>2</sub> H <sub>6</sub> : 0.5 % to 0.3 % (relative) C <sub>3</sub> H <sub>8</sub> : 0.5 % to 0.3 % (relative) <i>n</i> -C <sub>4</sub> H <sub>10</sub> : 0.5 % to 0.3 % (relative) <i>iso</i> -C <sub>4</sub> H <sub>10</sub> : 0.5 % to 0.3 % (relative) CH <sub>4</sub> : 0.5 % to 0.3 % (relative)		N <sub>2</sub> : • GC-TCD CO <sub>2</sub> : • GC-TCD C <sub>2</sub> H <sub>6</sub> : GC-FID or • GC-TCD C <sub>3</sub> H <sub>8</sub> : GC-FID or • GC-TCD <i>n</i> -C <sub>4</sub> H <sub>10</sub> : GC-FID or • GC-TCD <i>iso</i> -C <sub>4</sub> H <sub>10</sub> : • GC-FID or • GC-TCD CH <sub>4</sub> : • GC-TCD or • subtracting method
		N <sub>2</sub> /Ar *	1 µmol/mol to 200 µmol/mol	10 % to 0.5 % (relative)		• GC-MS
		CO <sub>2</sub> /air *	150 µmol/mol to 800 µmol/mol	0.02 µmol/mol to 0.08 µmol/mol		• CRDS

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Inorganic standard solution	Mg	0.8 g/kg to 1.2 g/kg	0.16 % (relative)	• Chelatometric titration	2019-11-01 *2021-09-29
	Al	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Cu	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Zn	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Fe	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Ni	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Sr	0.8 g/kg to 1.2 g/kg	0.08 % (relative)	• Gravimetric preparation	
	V	0.8 g/kg to 1.2 g/kg	0.08 % (relative)	• Gravimetric preparation	
	Mn	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Mo	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Co	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Cd	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Ga	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	In	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Pb	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Bi	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Ba	0.8 g/kg to 1.2 g/kg	0.16 % (relative)	• Gravimetric preparation	
	Cr	0.8 g/kg to 1.2 g/kg	0.06 % (relative)	• Gravimetric preparation	
	Tl	0.8 g/kg to 1.2 g/kg	0.28 % (relative)	• Gravimetric preparation	
	Sn	0.8 g/kg to 1.2 g/kg	0.14 % (relative)	• Gravimetric preparation	
	Na	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	K	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Li	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Rb	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Cs	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	As	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Sb	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Be	0.8 g/kg to 1.2 g/kg	0.18 % (relative)	• Gravimetric preparation	
	Zr	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Ag	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
	Ca	0.8 g/kg to 1.2 g/kg	0.10 % (relative)	• Gravimetric preparation	
	Hg	0.8 g/kg to 1.2 g/kg	0.10 % (relative)	• Gravimetric preparation	
	Se	0.8 g/kg to 1.2 g/kg	0.12 % (relative)	• Gravimetric preparation	
	B	0.8 g/kg to 1.2 g/kg	0.12 % (relative)	• Gravimetric preparation	
	Te	0.8 g/kg to 1.2 g/kg	0.13 % (relative)	• Gravimetric preparation	
	Si	0.8 g/kg to 1.2 g/kg	0.28 % (relative)	• Gravimetric preparation	
	La *	0.8 g/kg to 1.2 g/kg	0.13 % (relative)	• Chelatometric titration	
	Ti *	0.8 g/kg to 1.2 g/kg	0.19 % (relative)	• Gravimetric preparation	
	Y *	0.8 g/kg to 1.2 g/kg	0.13 % (relative)	• Chelatometric titration	
	chloride ion	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation	
nitrite ion	0.8 g/kg to 1.2 g/kg	0.18 % (relative)	• Gravimetric preparation		
nitrate ion	0.8 g/kg to 1.2 g/kg	0.15 % (relative)	• Gravimetric preparation		
phosphate ion	0.8 g/kg to 1.2 g/kg	0.18 % (relative)	• Gravimetric preparation		
bromide ion	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation		
iodide ion	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	• Gravimetric preparation		
sulfate ion	0.8 g/kg to 1.2 g/kg	0.12 % (relative)	• IC		
cyanide ion	0.8 g/kg to 1.2 g/kg	1.1 % (relative)	• Complexometric titration		

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Inorganic standard solution	chlorate ion	0.8 g/kg to 1.2 g/kg	0.15 % (relative)	• Gravimetric titration	2019-11-01 *2021-09-29
	bromate ion	1.6 g/kg to 2.4 g/kg	0.14 % (relative)	• Gravimetric titration	
	ammonium ion*	0.8 g/kg to 1.2 g/kg	0.13 % (relative)	• Gravimetric preparation	
	total organic carbon	0.8 g/kg to 1.2 g/kg	0.16 % (relative)	• Gravimetric preparation	
Inorganic standard solution (Isotopic standard)	$^{206}\text{Pb}/^{204}\text{Pb}$ (Isotopic ratio)	14 mol/mol to 22 mol/mol	0.025 % (relative)	• MC-ICP-MS	
	$^{207}\text{Pb}/^{204}\text{Pb}$ (Isotopic ratio)	13 mol/mol to 17 mol/mol	0.023 % (relative)	• MC-ICP-MS	
	$^{208}\text{Pb}/^{204}\text{Pb}$ (Isotopic ratio)	36 mol/mol to 40 mol/mol	0.023 % (relative)	• MC-ICP-MS	
	$^{208}\text{Pb}/^{206}\text{Pb}$ (Isotopic ratio)	1.8 mol/mol to 2.2 mol/mol	0.0062 % (relative)	• MC-ICP-MS	
	$^{207}\text{Pb}/^{206}\text{Pb}$ (Isotopic ratio)	0.8 mol/mol to 1.0 mol/mol	0.0042 % (relative)	• MC-ICP-MS	
	$^{204}\text{Pb}$ (Isotopic abundance)	0.012 mol/mol to 0.015 mol/mol	0.029 % (relative)	• MC-ICP-MS	
	$^{206}\text{Pb}$ (Isotopic abundance)	0.24 mol/mol to 0.28 mol/mol	0.0036 % (relative)	• MC-ICP-MS	
	$^{207}\text{Pb}$ (Isotopic abundance)	0.20 mol/mol to 0.23 mol/mol	0.0047 % (relative)	• MC-ICP-MS	
	$^{208}\text{Pb}$ (Isotopic abundance)	0.51 mol/mol to 0.53 mol/mol	0.0031 % (relative)	• MC-ICP-MS	
	Pb (Molar mass)	207.1 g/mol to 207.3 g/mol	0.000014 % (relative)	• MC-ICP-MS	
Inorganic standard solution (Isotopic standard) *	$^{56}\text{Fe}/^{54}\text{Fe}$ (Isotopic ratio)	11 mol/mol ~ 20 mol/mol	0.041 % (relative)	• MC-ICP-MS	
	$^{57}\text{Fe}/^{54}\text{Fe}$ (Isotopic ratio)	0.25 mol/mol ~ 0.47 mol/mol	0.063 % (relative)	• MC-ICP-MS	
	$^{58}\text{Fe}/^{54}\text{Fe}$ (Isotopic ratio)	0.034 mol/mol ~ 0.063 mol/mol	0.11 % (relative)	• MC-ICP-MS	
	$^{54}\text{Fe}$ (Isotopic abundance)	0.041 mol/mol ~ 0.076 mol/mol	0.038 % (relative)	• MC-ICP-MS	
	$^{56}\text{Fe}$ (Isotopic abundance)	0.064 mol/mol ~ 1.2 mol/mol	0.0037 % (relative)	• MC-ICP-MS	
	$^{57}\text{Fe}$ (Isotopic abundance)	0.015 mol/mol ~ 0.028 mol/mol	0.071 % (relative)	• MC-ICP-MS	
	$^{58}\text{Fe}$ (Isotopic abundance)	0.0020 mol/mol ~ 0.0037 mol/mol	0.11 % (relative)	• MC-ICP-MS	
	Fe (Molar mass)	55.29 g/mol ~ 56.4 g/mol	0.000068 % (relative)	• MC-ICP-MS	



Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
pH standard solution	pH	1.18 to 10.51	0.003	• Harned cell method	2019-11-01 *2021-09-29
Electrolytic conductivity standard solution	Electrolytic conductivity	0.05 S/m ~ 15 S/m	0.15 % ~ 0.48 % (relative)	• Impedance measurement	
		0.005 S/m ~ 0.05 S/m *	0.61 % (relative)	• Impedance measurement	
High purity inorganic material (Potassium hydrogen phthalate)	acid	99.9 % to 100.1 % (mass fraction as potassium hydrogen phthalate)	0.012 % to 0.015 %	• Coulometric titration	
High purity inorganic material (Potassium dichromate)	oxidant	99.9 % to 100.1 % (mass fraction as potassium dichromate)	0.010 % to 0.012 %	• Coulometric titration	
High purity inorganic material (Arsenic(III) trioxide)	reductant	99.9 % to 100.1 % (mass fraction as arsenic(III) trioxide)	0.014 % to 0.020 %	• Coulometric titration	
High purity inorganic material (Sodium carbonate)	base	99.9 % to 100.1 % (mass fraction as sodium carbonate)	0.01 % to 0.02 %	• Coulometric titration • Gravimetric titration	
High purity inorganic material (Potassium iodate)	oxidant	99.9 % to 100.1 % (mass fraction as potassium iodate)	0.014 % to 0.020 %	• Coulometric titration • Gravimetric titration	
High purity inorganic material (Sodium oxalate)	reductant	99.9 % to 100.1 % (mass fraction as sodium oxalate)	0.023 % to 0.025 %	• Coulometric titration • Gravimetric titration	
Heavy metals in polymer	Cd	5 mg/kg to 10000 mg/kg	0.5 % to 2.0 % (relative)	• ICP-OES • ICP-MS • ID-ICP-MS	
	Cr	10 mg/kg to 10000 mg/kg	0.5 % to 2.0 % (relative)	• ICP-OES • ICP-MS • ID-ICP-MS	
	Hg	10 mg/kg to 10000 mg/kg	0.5 % to 2.0 % (relative)	• ICP-OES • ICP-MS • ID-ICP-MS	
	Pb	10 mg/kg to 10000 mg/kg	0.5 % to 2.0 % (relative)	• ICP-OES • ICP-MS • ID-ICP-MS	
	Br	50 mg/kg to 10000 mg/kg	2.0 % to 5.0 % (relative)	• ID-ICP-MS • NAA	
Minor elements in metals and alloys (lead-free solder)	Pb	100 mg/kg to 2000 mg/kg	0.8 % to 1.6 % (relative)	• ID-ICP-MS	
	Ag	2.8 % to 3.2 % (mass fraction)	0.8 % to 1.6 % (relative)	• ID-ICP-MS	
	Cu	0.3 % to 0.7 % (mass fraction)	0.5 % to 1.0 % (relative)	• ID-ICP-MS	
High purity inorganic material (Sodium chloride)	Cl	99.9 % to 100.1 % (mass fraction as sodium chloride)	0.03 % to 0.05 %	• Coulometric titration	
High purity inorganic material (Ammonium chloride)	NH <sub>3</sub>	99.9 % to 100.1 % (mass fraction as ammonium chloride)	0.034 % to 0.070 %	• Coulometric titration	
	Cl	99.9 % to 100.1 % (mass fraction as ammonium chloride)	0.054 % to 0.080 %	• Gravimetric titration	
High purity inorganic material (Amidosulfuric acid)	acid	99.9 % to 100.1 % (mass fraction as amidosulfuric acid)	0.008 % to 0.012 %	• Coulometric titration	
	N	99.9 % to 100.1 % (mass fraction as amidosulfuric acid)	0.025 % to 0.040 %	• Coulometric titration	
Hydrochloric acid	acid	0.05 mol/kg to 2 mol/kg	0.016 % to 0.027 % (relative)	• Coulometric titration	
High purity inorganic material (Tris(hydroxymethyl)aminomethane)	base	99.8 % to 100.2 % (mass fraction as tris(hydroxymethyl)aminomethane)	0.026 %	• Coulometric titration	
High purity inorganic material (Calcium carbonate)	Ca	99.5 % to 100.5 % (mass fraction as calcium carbonate)	0.030 %	• Chelatometric titration	
High purity inorganic material (Zinc)	Zn	99.5 % to 100.0 % (mass fraction as zinc)	0.008 %	• Subtracting method with impurity analysis	
	Zn (molar mass)	65.36 g/mol to 65.40 g/mol	0.0018 % (relative)	• ICP-MS	

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
High purity organic materials	ethanol	0.998 mol/mol to 1 mol/mol	0.002 mol/mol to 0.0004 mol/mol	• Freezing point depression method	2019-11-01
	toluene	0.998 mol/mol to 1 mol/mol	0.003 mol/mol to 0.0006 mol/mol	• Freezing point depression method	
	1,2-dichloroethane	0.998 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0001 mol/mol	• Freezing point depression method	
	benzene	0.998 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0002 mol/mol	• Freezing point depression method	
	<i>o</i> -xylene	0.998 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0002 mol/mol	• Freezing point depression method	
	ethylbenzene	0.998 mol/mol to 1 mol/mol	0.0002 mol/mol to 0.002 mol/mol	• Freezing point depression method	
	cholesterol	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Freezing point depression method	
	<i>m</i> -xylene	0.997 mol/mol to 1 mol/mol	0.001 mol/mol to 0.00015 mol/mol	• Freezing point depression method	
	diethyl phthalate	0.997 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0002 mol/mol	• Freezing point depression method	
	chloroform	0.995 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0002 mol/mol	• Freezing point depression method	
	<i>p</i> -xylene	0.995 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0001 mol/mol	• Freezing point depression method	
	bromoform	0.995 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0002 mol/mol	• Freezing point depression method	
	bromodichloromethane	0.995 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0002 mol/mol	• Freezing point depression method	
	bisphenol A	0.995 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0006 mol/mol	• Freezing point depression method	
	dibromochloromethane	0.995 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0002 mol/mol	• Freezing point depression method	
	<i>trans</i> -1,2-dichloroethylene	0.995 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0002 mol/mol	• Freezing point depression method	
	trichloroethylene	0.995 mol/mol to 1 mol/mol	0.002 mol/mol	• Freezing point depression method	
	tetrachloroethylene	0.995 mol/mol to 1 mol/mol	0.005 mol/mol to 0.0001 mol/mol	• Freezing point depression method	
	1,1,1-trichloroethane	0.995 mol/mol to 1 mol/mol	0.005 mol/mol to 0.0004 mol/mol	• Freezing point depression method	
	<i>cis</i> -1,2-dichloroethylene	0.99 mol/mol to 1 mol/mol	0.005 mol/mol to 0.0007 mol/mol	• Freezing point depression method	
	<i>cis</i> -1,3-dichloropropene	0.995 mol/mol to 1 mol/mol	0.005 mol/mol to 0.003 mol/mol	• Freezing point depression method	
	1,4-dichlorobenzene	0.995 mol/mol to 1 mol/mol	0.005 mol/mol to 0.0003 mol/mol	• Freezing point depression method	
styrene	0.99 kg/kg to 1.00 kg/kg	0.01 kg/kg to 0.0005 kg/kg	• Combination of a freezing point depression method and a subtracting method		

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
High purity organic materials	dichloromethane	0.995 mol/mol to 1 mol/mol	0.005 mol/mol to 0.0001 mol/mol	• Freezing point depression method	2019-11-01 *2021-09-29
	tetrachloromethane	0.995 mol/mol to 1 mol/mol	0.005 mol/mol to 0.0001 mol/mol	• Freezing point depression method	
	1,1-dichloroethylene	0.995 mol/mol to 1 mol/mol	0.005 mol/mol to 0.0001 mol/mol	• Freezing point depression method	
	1,1,2-trichloroethane	0.995 mol/mol to 1 mol/mol	0.005 mol/mol to 0.0001 mol/mol	• Freezing point depression method	
	<i>trans</i> -1,3-dichloropropene	0.97 mol/mol to 1 mol/mol	0.005 mol/mol to 0.003 mol/mol	• Freezing point depression method	
	1,2-dichloropropane	0.995 mol/mol to 1 mol/mol	0.005 mol/mol to 0.003 mol/mol	• Freezing point depression method	
	acrylonitrile	0.99 kg/kg to 1.00 kg/kg	0.01 kg/kg to 0.00005 kg/kg	• Combination of a freezing point depression method and a subtracting method	
	acetaldehyde	0.99 kg/kg to 1.00 kg/kg	0.01 kg/kg to 0.003 kg/kg	• Titration • Subtracting method (GC-FID)	
	17 $\beta$ -estradiol	0.96 kg/kg to 1.00 kg/kg	0.005 kg/kg to 0.003 kg/kg	• qNMR • Subtracting method (HPLC-UV, HPLC-CAD, HS-GC-MS, Coulometric Karl-Fisher titration and TG)	
	progesterone	0.98 kg/kg to 1.00 kg/kg	0.01 kg/kg to 0.001 kg/kg	• qNMR • Freezing point depression method • Subtracting method (HPLC-UV, HPLC-CAD, HS-GC-MS, Coulometric Karl-Fisher titration and TG)	
	testosterone	0.98 kg/kg to 1.00 kg/kg	0.01 kg/kg to 0.001 kg/kg	• qNMR • Subtracting method (HPLC-UV, HPLC-CAD, HS-GC-MS, Coulometric Karl-Fisher titration and TG)	
	sulfur in organic materials (as sulfur)	0.2 kg/kg to 0.4 kg/kg	0.00006 kg/kg to 0.0004 kg/kg	• Freezing point depression method • Subtracting method (GC-FID, GC-SCD and Coulometric Karl-Fischer titration)	
	dibutyl sulfide	0.995 kg/kg to 1 kg/kg	0.001 kg/kg to 0.0001 kg/kg	• Freezing point depression method • Subtracting method (GC-FID, GC-SCD and Coulometric Karl-Fischer titration)	
	1,4-dioxane	0.998 kg/kg to 1 kg/kg	0.001 kg/kg to 0.0001 kg/kg	• Freezing point depression method	
	<i>tert</i> -butylmethylether	0.998 kg/kg to 1 kg/kg	0.001 kg/kg to 0.0003 kg/kg	• Freezing point depression method	
	trichloroacetic acid *	0.995 kg/kg to 1 kg/kg	0.002 kg/kg	• Freezing point depression method • Titration	
	3,5-bis(trifluoromethyl)benzoic acid *	0.999 kg/kg to 1 kg/kg	0.0003 kg/kg to 0.0001 kg/kg	• Freezing point depression method • Coulometric titration • Subtracting method (HPLC-UV, GC-FID, Coulometric Karl-Fischer titration and TG)	
	1,4-bis(trimethylsilyl)-2,3,5,6-tetrafluorobenzene *	0.999 kg/kg to 1 kg/kg	0.0003 kg/kg to 0.0001 kg/kg	• Freezing point depression method • Subtracting method (HPLC-UV, GC-FID, Coulometric Karl-Fischer titration and TG)	

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
High purity organic materials	di- <i>n</i> -butyl phthalate	0.98 kg/kg to 1 kg/kg	0.001 kg/kg to 0.0002 kg/kg	• Subtracting method (HPLC-UV, GC-FID and Coulometric Karl-Fischer titration)	2019-11-01
	di-2-ethylhexyl phthalate	0.98 kg/kg to 1 kg/kg	0.001 kg/kg to 0.0002 kg/kg	• Subtracting method (HPLC-UV, GC-FID and Coulometric Karl-Fischer titration)	
	di- <i>n</i> -propyl phthalate	0.98 kg/kg to 1 kg/kg	0.0006 kg/kg to 0.0002 kg/kg	• Subtracting method (HPLC-UV, GC-FID and Coulometric Karl-Fischer titration)	
	di- <i>n</i> -pentyl phthalate	0.97 kg/kg to 1 kg/kg	0.006 kg/kg to 0.0002 kg/kg	• Subtracting method (HPLC-UV, GC-FID and Coulometric Karl-Fischer titration)	
	di- <i>n</i> -hexyl phthalate	0.97 kg/kg to 1 kg/kg	0.006 kg/kg to 0.0002 kg/kg	• Subtracting method (HPLC-UV, GC-FID and Coulometric Karl-Fischer titration)	
	dicyclohexyl phthalate	0.98 kg/kg to 1 kg/kg	0.001 kg/kg to 0.0002 kg/kg	• Subtracting method (HPLC-UV, GC-FID and Coulometric Karl-Fischer titration)	
	butyl benzyl phthalate	0.98 kg/kg to 1 kg/kg	0.0015 kg/kg to 0.0002 kg/kg	• Subtracting method (HPLC-UV, GC-FID and Coulometric Karl-Fischer titration)	
	simazine	0.98 kg/kg to 1 kg/kg	0.001 kg/kg to 0.0002 kg/kg	• Subtracting method (HPLC-UV, GC-FID, GC-MS and Coulometric Karl-Fischer titration)	
	thiuram	0.98 kg/kg to 1 kg/kg	0.001 kg/kg to 0.0002 kg/kg	• qNMR • Subtracting method (HPLC-UV, GC-FID and Coulometric Karl-Fischer titration)	
	thiobencarb	0.98 kg/kg to 1 kg/kg	0.001 kg/kg to 0.0002 kg/kg	• Freezing point depression method • qNMR • Subtracting method (HPLC-UV, GC-FID and Coulometric Karl-Fischer titration)	
	4- <i>n</i> -nonylphenol	0.99 mol/mol to 1 mol/mol	0.005 mol/mol to 0.001 mol/mol	• Freezing point depression method	
	4- <i>t</i> -octylphenol	0.98 kg/kg to 1 kg/kg	0.001 kg/kg to 0.0002 kg/kg	• Subtracting method (HPLC-UV, GC-FID and Coulometric Karl-Fischer titration)	
	4- <i>t</i> -butylphenol	0.98 kg/kg to 1 kg/kg	0.001 kg/kg to 0.0002 kg/kg	• Subtracting method (HPLC-UV, GC-FID and Coulometric Karl-Fischer titration)	
	4- <i>n</i> -heptylphenol	0.99 mol/mol to 1 mol/mol	0.005 mol/mol to 0.001 mol/mol	• Freezing point depression method	
2,4-dichlorophenol	0.99 mol/mol to 1 mol/mol	0.005 mol/mol to 0.001 mol/mol	• Freezing point depression method		
Environmental matrix (fish oil)	<i>p,p'</i> -DDE	1 mg/kg to 10 mg/kg	0.014 mg/kg	• ID-GC-MS	
	<i>p,p'</i> -DDT	0.05 mg/kg to 0.5 mg/kg	0.0031 mg/kg	• ID-GC-MS	

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Organic standard solution	<i>p,p'</i> -DDT/2,2,4-trimethylpentane	0.05 mg/kg to 20 mg/kg	7 % (relative)	• Freezing point depression method • HPLC-UV • Gravimetric preparation	2019-11-01 *2021-09-29
	<i>p,p'</i> -DDE/2,2,4-trimethylpentane	0.5 mg/kg to 20 mg/kg	2 % (relative)	• Freezing point depression method • GC-FID • Gravimetric preparation	
	$\gamma$ -HCH/2,2,4-trimethylpentane	0.03 mg/kg to 20 mg/kg	1 % (relative)	• Subtracting method (GC-FID) • Gravimetric preparation	
	<i>p,p'</i> -DDT + <i>p,p'</i> -DDE + <i>p,p'</i> -DDD + $\gamma$ -HCH /2,2,4-trimethylpentane	<i>p,p'</i> -DDT : 0.05 mg/kg to 20 mg/kg <i>p,p'</i> -DDE : 0.5 mg/kg to 20 mg/kg <i>p,p'</i> -DDD : 0.5 mg/kg to 20 mg/kg $\gamma$ -HCH : 0.03 mg/kg to 20 mg/kg	<i>p,p'</i> -DDT : 2 % to 1 % (relative) <i>p,p'</i> -DDE : 1 % to 0.5 % (relative) <i>p,p'</i> -DDD : 1 % to 0.5 % (relative) $\gamma$ -HCH : 2 % to 0.5 % (relative)	• Freezing point depression method • HPLC-UV • GC-FID • Gravimetric preparation	
	PCB28/2,2,4-trimethylpentane	2 mg/kg to 50 mg/kg	1.7 % (relative)	• Freezing point depression method • GC-FID • Gravimetric preparation	
	PCB70/2,2,4-trimethylpentane	2 mg/kg to 50 mg/kg	1.8 % (relative)	• Freezing point depression method • GC-FID • Gravimetric preparation	
	PCB105/2,2,4-trimethylpentane	2 mg/kg to 50 mg/kg	2.4 % (relative)	• Freezing point depression method • GC-FID • Gravimetric preparation	
	PCB153/2,2,4-trimethylpentane	2 mg/kg to 50 mg/kg	1.7 % (relative)	• Freezing point depression method • GC-FID • Gravimetric preparation	
	PCB170/2,2,4-trimethylpentane	2 mg/kg to 50 mg/kg	2.0 % (relative)	• Freezing point depression method • GC-FID • Gravimetric preparation	
	PCB194/2,2,4-trimethylpentane	2 mg/kg to 50 mg/kg	1.6 % (relative)	• Freezing point depression method • GC-FID • Gravimetric preparation	
	PCB28+PCB70+PCB105 +PCB153+PCB170+PCB194 /2,2,4-trimethylpentane	PCB28 : 2 mg/kg to 50 mg/kg PCB70 : 2 mg/kg to 50 mg/kg PCB105 : 2 mg/kg to 50 mg/kg PCB153 : 2 mg/kg to 50 mg/kg PCB170 : 2 mg/kg to 50 mg/kg PCB194 : 2 mg/kg to 50 mg/kg	PCB28 : 1.7 % (relative) PCB70 : 1.8 % (relative) PCB105 : 2.4 % (relative) PCB153 : 1.7 % (relative) PCB170 : 2.0 % (relative) PCB194 : 1.6 % (relative)	• Freezing point depression method • GC-FID • Gravimetric preparation	
	4-hydroxy-clomifene *	4-hydroxy-clomifene: 200 $\mu$ g/g to 300 $\mu$ g/g ( <i>E</i> )-4-hydroxy-clomifene: 50 $\mu$ g/g to 200 $\mu$ g/g ( <i>Z</i> )-4-hydroxy-clomifene: 50 $\mu$ g/g to 200 $\mu$ g/g	4-hydroxy-clomifene: 1.5 % (relative) ( <i>E</i> )-4-hydroxy-clomifene: 1.6 % (relative) ( <i>Z</i> )-4-hydroxy-clomifene: 1.6 % (relative)	• qNMR • qNMR/HPLC-UV • Gravimetric preparation	
	3 $\beta$ ,4 $\alpha$ -dihydroxy-5 $\alpha$ -androstane-17-one *	100 $\mu$ g/g to 170 $\mu$ g/g	1.4 % (relative)	• qNMR • qNMR/HPLC-UV • Gravimetric preparation	
	sulfur in toluene (as sulfur)	0.5 mg/kg to 10000 mg/kg	0.02 mg/kg to 10 mg/kg	• Freezing point depression method • Subtracting method (GC-FID, GC-FPD and Coulometric Karl-Fischer titration) • Gravimetric preparation	
		10 $\mu$ g/kg to 500 $\mu$ g/kg	5 $\mu$ g/kg to 20 $\mu$ g/kg	• Combustion-ultraviolet fluorescence method	
CRMs for thermal properties	cyclohexane (thermal analysis with thermal analyzer such as DSC)	phase transition temperature	0.04 K to 0.1 K	• Adiabatic calorimetry	
		186 K to 280 K			
		phase transition enthalpy	0.7 Jg <sup>-1</sup> to 3 Jg <sup>-1</sup>	• Adiabatic calorimetry	
	30 Jg <sup>-1</sup> to 90 Jg <sup>-1</sup>				
High purity organic materials	perfluorooctanoic acid	0.95 kg/kg to 1 kg/kg	0.006 kg/kg to 0.002 kg/kg	• Titration and • Subtracting method (LC-MS, Karl Fischer titration, TG)	
	chloroalkanes *	0.98 kg/kg to 1 kg/kg	0.005 kg/kg to 0.001 kg/kg	Subtracting method (GC-FID, HS-GC-MS, Karl Fischer titration, TG)	

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Organic standard solution	benzo[a]pyrene/ 2,2,4-trimethylpentane	10 mg/kg to 200 mg/kg	4 % to 1 % (relative)	• Freezing point depression method and • Gravimetric preparation method	2019-11-01
	potassium perfluorooctanesulfonate /methanol	5 mg/kg to 100 mg/kg	4 % to 1 % (relative)	• Freezing point depression method and • Gravimetric preparation method	
Standard solution (water in organic solvent)	water	0.01 g/kg to 10 g/kg	30 % to 0.1 % (relative)	• Coulometric titration and Volumetric titration or • Coulometric titration only	
Food (pesticide in grain)	fenitrothion	0.1 mg/kg to 1 mg/kg	20 % to 5 % (relative)	• ID-GC-MS and • ID-LC-MS	
	etofenprox	0.1 mg/kg to 1 mg/kg	30 % to 5 % (relative)	• ID-GC-MS and • ID-LC-MS	
Food (pesticide in vegetable)	diazinon	0.1 mg/kg to 100 mg/kg	40 % to 5 % (relative)	• ID-GC-MS	
	fenitrothion	0.1 mg/kg to 100 mg/kg	20 % to 3 % (relative)	• ID-GC-MS	
	chlorpyrifos	1 mg/kg to 100 mg/kg	40 % to 5 % (relative)	• ID-GC-MS	
	permethrin	0.1 mg/kg to 100 mg/kg	30 % to 4 % (relative)	• ID-GC-MS	
	cypermethrin	0.1 mg/kg to 100 mg/kg	40 % to 5 % (relative)	• ID-GC-MS	
	etofenprox	1 mg/kg to 1000 mg/kg	20 % to 3 % (relative)	• ID-GC-MS	
Food (pesticide in fruits)	diazinon	0.1 mg/kg to 10 mg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	fenitrothion	0.1 mg/kg to 10 mg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	permethrin	0.1 mg/kg to 10 mg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	cypermethrin	0.1 mg/kg to 10 mg/kg	30 % to 3 % (relative)	• ID-GC-MS	
Food (pesticide in beans)	diazinon	0.001 mg/kg to 0.1 mg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	fenitrothion	0.001 mg/kg to 0.2 mg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	chlorpyrifos	0.001 mg/kg to 0.3 mg/kg	30 % to 3 % (relative)	• ID-GC-MS	
	permethrin	0.002 mg/kg to 0.1 mg/kg	20 % to 2 % (relative)	• ID-GC-MS	

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Environmental matrix (trace elements in sediment)	Sb	0.1 mg/kg to 3 mg/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ID-ICP-MS</li> <li>• GFAAS</li> <li>• HR-ICP-MS</li> </ul>	2019-11-01
	Cd	0.1 mg/kg to 3 mg/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• GFAAS</li> </ul>	
	Cu	5 mg/kg to 500 mg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	Pb	2 mg/kg to 250 mg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	Ni	5 mg/kg to 50 mg/kg	5 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	Zn	20 mg/kg to 1000 mg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-OES</li> </ul>	
	As	1 mg/kg to 50 mg/kg	20 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> <li>• HR-ICP-MS</li> </ul>	
	Co	1 mg/kg to 50 mg/kg	15 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	Se	0.1 mg/kg to 5 mg/kg	20 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• HR-ICP-MS</li> </ul>	
	Cr	10 mg/kg to 500 mg/kg	10 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	Hg	0.02 mg/kg to 5 mg/kg	15 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• Heating evaporation-Gold amalgamation AAS</li> </ul>	
	Ag	0.05 mg/kg to 2 mg/kg	4 % to 3 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> </ul>	
	Mo	0.5 mg/kg to 20 mg/kg	7 % to 3 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> </ul>	
	Sn	1 mg/kg to 50 mg/kg	5 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> </ul>	
Environmental (polychlorinated biphenyls in mineral oil)	PCB3	0.2 µg/kg to 10 mg/kg	50 % to 3 % (relative)	• ID-GC-MS	
	PCB8	0.2 µg/kg to 10 mg/kg	50 % to 3 % (relative)	• ID-GC-MS	
	PCB28	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	• ID-GC-MS	
	PCB52	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	• ID-GC-MS	
	PCB101	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	• ID-GC-MS	
	PCB118	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	• ID-GC-MS	
	PCB138	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	• ID-GC-MS	
	PCB153	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	• ID-GC-MS	
	PCB180	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	• ID-GC-MS	
	PCB194	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	• ID-GC-MS	
PCB206	0.09 µg/kg to 10 mg/kg	50 % to 3 % (relative)	• ID-GC-MS		

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Environmental matrix (fish tissue)	PCB28	1 µg/kg to 100 µg/kg	15 % to 2 % (relative)	• ID-GC-MS	2019-11-01 *2021-09-29
	PCB70	1 µg/kg to 10 µg/kg	15 % to 5 % (relative)	• ID-GC-MS	
	PCB105	1 µg/kg to 100 µg/kg	15 % to 2 % (relative)	• ID-GC-MS	
	PCB153	10 µg/kg to 200 µg/kg	10 % to 2 % (relative)	• ID-GC-MS	
	PCB170	0.1 µg/kg to 10 µg/kg	10 % to 4 % (relative)	• ID-GC-MS	
	<i>p,p'</i> -DDT	1 µg/kg to 10 µg/kg	10 % to 5 % (relative)	• ID-GC-MS	
	<i>p,p'</i> -DDE	10 µg/kg to 100 µg/kg	15 % to 5 % (relative)	• ID-GC-MS	
	<i>p,p'</i> -DDD	1 µg/kg to 10 µg/kg	10 % to 5 % (relative)	• ID-GC-MS	
	dieldrin	1 µg/kg to 10 µg/kg	10 % to 3 % (relative)	• ID-GC-MS	
	<i>trans</i> -nonachlor	1 µg/kg to 10 µg/kg	10 % to 4 % (relative)	• ID-GC-MS	
Environmental matrix (PAHs/dust)	fluorene	0.1 mg/kg to 100 mg/kg	40 % to 10 % (relative)	• ID-GC-MS	
	anthracene	0.1 mg/kg to 100 mg/kg	40 % to 10 % (relative)	• ID-GC-MS	
	fluoranthene	1 mg/kg to 1000 mg/kg	30 % to 10 % (relative)	• ID-GC-MS	
	pyrene	1 mg/kg to 1000 mg/kg	30 % to 10 % (relative)	• ID-GC-MS	
	benzo[ <i>a</i> ]anthracene	0.1 mg/kg to 100 mg/kg	20 % to 10 % (relative)	• ID-GC-MS	
	benzo[ <i>b</i> ]fluoranthene	0.1 mg/kg to 100 mg/kg	20 % to 10 % (relative)	• ID-GC-MS	
	benzo[ <i>k</i> ]fluoranthene	0.01 mg/kg to 10 mg/kg	20 % to 10 % (relative)	• ID-GC-MS	
	benzo[ <i>a</i> ]pyrene	0.1 mg/kg to 100 mg/kg	30 % to 10 % (relative)	• ID-GC-MS	
	perylene	0.01 mg/kg to 10 mg/kg	30 % to 10 % (relative)	• ID-GC-MS	
	indeno[1,2,3- <i>cd</i> ]pyrene	0.1 mg/kg to 100 mg/kg	40 % to 10 % (relative)	• ID-GC-MS	
	benzo[ <i>ghi</i> ]perylene	0.1 mg/kg to 100 mg/kg	20 % to 10 % (relative)	• ID-GC-MS	
Environmental matrix (toxic elements in tunnel dust)	Cr	5 mg/kg to 5 % (mass fraction)	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS	
	Ni	5 mg/kg to 2 % (mass fraction)	5 % to 2 % (relative)	• ID-ICP-MS • ICP-MS • ICP-OES	
	Pb	2 mg/kg to 1 % (mass fraction)	5 % to 2 % (relative)	• ID-ICP-MS • ICP-MS • ICP-OES	
	Mn	2 mg/kg to 1 % (mass fraction)	5 % to 2 % (relative)	• ICP-MS • ICP-OES • GFAAS	
	Cd	0.1 mg/kg to 0.1 % (mass fraction)	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS	
Environmental matrix (polychlorinated biphenyls / pesticide in biological sample)	PCB118	5 ng/kg to 200 ng/kg	40 % to 10 % (relative)	• ID-GC-MS	
	PCB138	5 ng/kg to 200 ng/kg	40 % to 10 % (relative)	• ID-GC-MS	
	PCB153	5 ng/kg to 200 ng/kg	40 % to 10 % (relative)	• ID-GC-MS	
	PCB194	5 ng/kg to 200 ng/kg	40 % to 10 % (relative)	• ID-GC-MS	
	acetamiprid *	0.1 µg/kg to 2 µg/kg	50 % to 10 % (relative)	• ID-LC-MS	
	clothianidin *	0.1 µg/kg to 2 µg/kg	50 % to 10 % (relative)	• ID-LC-MS	
	thiacloprid *	0.1 µg/kg to 2 µg/kg	50 % to 10 % (relative)	• ID-LC-MS	
	thiamethoxam *	0.1 µg/kg to 2 µg/kg	50 % to 10 % (relative)	• ID-LC-MS	



Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Environmental (polychlorinated biphenyls and organochlorine pesticides in sediment)	PCB3	0.1 µg/kg to 100 µg/kg	30 % to 5 % (relative)	• ID-GC-MS	2019-11-01
	PCB15	0.1 µg/kg to 100 µg/kg	20 % to 4 % (relative)	• ID-GC-MS	
	PCB28	1 µg/kg to 1000 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	PCB31	0.5 µg/kg to 1000 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	PCB70	0.5 µg/kg to 1000 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	PCB101	1 µg/kg to 1000 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	PCB105	0.5 µg/kg to 1000 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	PCB138	0.5 µg/kg to 1000 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	PCB153	1 µg/kg to 1000 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	PCB170	0.5 µg/kg to 1000 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	PCB180	0.5 µg/kg to 1000 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	PCB194	0.1 µg/kg to 100 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	PCB206	0.1 µg/kg to 100 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	PCB209	0.1 µg/kg to 100 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	<i>p,p'</i> -DDT	0.5 µg/kg to 1000 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	<i>p,p'</i> -DDE	0.5 µg/kg to 1000 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	<i>p,p'</i> -DDD	0.5 µg/kg to 1000 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
	$\gamma$ -HCH	0.5 µg/kg to 1000 µg/kg	20 % to 2 % (relative)	• ID-GC-MS	
Environmental (polycyclic aromatic hydrocarbons in sediment)	fluorene	1 µg/kg to 100 mg/kg	20 % to 10 % (relative)	• ID-GC-MS	2019-11-01
	phenanthrene	1 µg/kg to 100 mg/kg	20 % to 10 % (relative)	• ID-GC-MS • ID-LC-MS	
	anthracene	1 µg/kg to 100 mg/kg	40 % to 10 % (relative)	• ID-GC-MS • ID-LC-MS	
	fluoranthene	1 µg/kg to 100 mg/kg	20 % to 5 % (relative)	• ID-GC-MS • ID-LC-MS	
	pyrene	1 µg/kg to 100 mg/kg	20 % to 10 % (relative)	• ID-GC-MS • ID-LC-MS	
	benzo[ <i>c</i> ]phenanthrene	1 µg/kg to 100 mg/kg	10 % to 5 % (relative)	• ID-GC-MS • ID-LC-MS	
	benz[ <i>a</i> ]anthracene	1 µg/kg to 100 mg/kg	20 % to 10 % (relative)	• ID-GC-MS • ID-LC-MS	
	chrysene	1 µg/kg to 100 mg/kg	10 % to 5 % (relative)	• ID-GC-MS • ID-LC-MS	
	benzo[ <i>b</i> ]fluoranthene	1 µg/kg to 100 mg/kg	40 % to 10 % (relative)	• ID-GC-MS	
	benzo[ <i>j</i> ]fluoranthene	1 µg/kg to 100 mg/kg	40 % to 10 % (relative)	• ID-GC-MS • ID-LC-MS	
	benzo[ <i>k</i> ]fluoranthene	1 µg/kg to 100 mg/kg	30 % to 10 % (relative)	• ID-GC-MS • ID-LC-MS	
	benzo[ <i>a</i> ]fluoranthene	1 µg/kg to 100 mg/kg	50 % to 10 % (relative)	• ID-GC-MS • ID-LC-MS	
	benzo[ <i>e</i> ]pyrene	1 µg/kg to 100 mg/kg	30 % to 10 % (relative)	• ID-GC-MS • ID-LC-MS	
	benzo[ <i>a</i> ]pyrene	1 µg/kg to 100 mg/kg	20 % to 5 % (relative)	• ID-GC-MS • ID-LC-MS	
	perylene	100 µg/kg to 100 mg/kg	30 % to 10 % (relative)	• ID-GC-MS	
	indeno[1,2,3- <i>cd</i> ]pyrene	1 µg/kg to 100 mg/kg	40 % to 10 % (relative)	• ID-GC-MS • ID-LC-MS	
	benzo[ <i>ghi</i> ]perylene	1 µg/kg to 100 mg/kg	30 % to 10 % (relative)	• ID-GC-MS • ID-LC-MS	
	dibenz[ <i>a,h</i> ]anthracene	1 µg/kg to 100 mg/kg	50 % to 10 % (relative)	• ID-GC-MS • ID-LC-MS	
Fuel (components in bioethanol fuel)	water	100 mg/kg to 5000 mg/kg	2 % to 0.2 % (relative)	• Coulometric titration and • Volumetric titration	2019-11-01
	methanol	0.2 g/kg to 1 g/kg	10 % to 2 % (relative)	• ID-GC-MS and • GC-FID	
	S	1 mg/kg to 5 mg/kg	3 % (relative)	• Combustion-ultraviolet fluorescence method and • Combustion-ion chromatography	
	Cu	0.0001 mg/kg to 500 mg/kg	10 % to 1 % (relative)	• ICP-MS • ID-ICP-MS • GFAAS	

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Fuel (components in biodiesel fuel)	water	300 mg/kg to 1000 mg/kg	10 % to 5 % (relative)	<ul style="list-style-type: none"> <li>• Coulometric titration and</li> <li>• Volumetric titration</li> </ul>	2019-11-01
	Na	0.5 mg/kg to 20 mg/kg	20 % to 5 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS/MS</li> <li>• HR-ICP-MS</li> <li>• FAAS</li> </ul>	
	Mg	0.5 mg/kg to 20 mg/kg	20 % to 5 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS/MS</li> <li>• ICP-MS/MS</li> </ul>	
	K	0.5 mg/kg to 20 mg/kg	20 % to 5 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS/MS</li> <li>• ICP-MS/MS</li> </ul>	
	Ca	0.5 mg/kg to 20 mg/kg	20 % to 5 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS/MS</li> <li>• ICP-MS/MS</li> </ul>	
	P	0.5 mg/kg to 20 mg/kg	20 % to 5 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS/MS</li> <li>• FI-ICP-MS</li> <li>• ICP-OES</li> </ul>	
	S	2 mg/kg to 50 mg/kg	10 % to 5 % (relative)	<ul style="list-style-type: none"> <li>• Standard addition method (Combustion-ion chromatograph)</li> </ul>	
Environmental matrix (river water and drinking water)	Al	1 µg/kg to 100 µg/kg	8 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> <li>• GFAAS</li> </ul>	2019-11-01
	Sb	0.001 µg/kg to 10 µg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• HR-ICP-MS</li> <li>• ICP-MS/MS</li> </ul>	
	As	0.05 µg/kg to 50 µg/kg	15 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> <li>• GFAAS</li> </ul>	
	Ba	0.5 µg/kg to 50 µg/kg	2 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> </ul>	
	B	1 µg/kg to 100 µg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> </ul>	
	Cd	0.001 µg/kg to 10 µg/kg	15 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> </ul>	
	Cr	0.05 µg/kg to 50 µg/kg	8 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> </ul>	
	Cu	0.05 µg/kg to 50 µg/kg	15 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> </ul>	
	Fe	0.1 µg/kg to 100 µg/kg	10 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> </ul>	
	Pb	0.001 µg/kg to 10 µg/kg	15 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> </ul>	
	Mn	0.01 µg/kg to 50 µg/kg	15 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> <li>• GFAAS</li> </ul>	
	Mo	0.05 µg/kg to 10 µg/kg	2 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• HR-ICP-MS</li> <li>• ICP-MS/MS</li> </ul>	
	Ni	0.01 µg/kg to 50 µg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> </ul>	
	Se	0.1 µg/kg to 50 µg/kg	10 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> </ul>	
	Zn	0.05 µg/kg to 50 µg/kg	10 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> </ul>	
	Na	1 mg/kg to 50 mg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• MP-AES</li> </ul>	
	K	0.2 mg/kg to 50 mg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• MP-AES</li> </ul>	
	Mg	0.2 mg/kg to 50 mg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• MP-AES</li> </ul>	
	Ca	1 mg/kg to 50 mg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• MP-AES</li> </ul>	

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Environmental matrix (river water and drinking water)	Rb	0.05 µg/kg to 100 µg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> </ul>	2019-11-01 *2021-09-29
	Sr	0.05 µg/kg to 200 µg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-MS/MS</li> </ul>	
	P	1 µg/kg to 100 µg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> </ul>	
Environmental matrix (sea water) *	Cr	1 µg/kg to 20000 µg/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> </ul>	
	Mn	1 µg/kg to 20000 µg/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• GFAAS</li> </ul>	
	Fe	1 µg/kg to 20000 µg/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> </ul>	
	Ni	1 µg/kg to 20000 µg/kg	15 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> </ul>	
	Cu	1 µg/kg to 20000 µg/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> </ul>	
	Zn	1 µg/kg to 20000 µg/kg	20 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> </ul>	
	As	1 µg/kg to 20000 µg/kg	15 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• GFAAS</li> </ul>	
	Se	1 µg/kg to 20000 µg/kg	15 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> </ul>	
	Cd	0.3 µg/kg to 20000 µg/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> </ul>	
	Pb	1 µg/kg to 20000 µg/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> </ul>	
	dissolved silica	0.03 mg/kg ~ 5 mg/kg	12 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• Colorimetry</li> <li>• IC</li> <li>• IC-ID-ICP-MS</li> </ul>	
	nitrate ion	0.8 mg/kg ~ 3 mg/kg	3 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• Colorimetry</li> <li>• IC</li> </ul>	
nitrite ion	0.01 mg/kg ~ 0.3 mg/kg	20 % to 5 % (relative)	<ul style="list-style-type: none"> <li>• Colorimetry</li> <li>• IC</li> </ul>		
phosphate ion	0.1 mg/kg ~ 0.3 mg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• Colorimetry</li> </ul>		
Standard solution for chemical speciation	arsenobetaine	1 mg/kg to 1000 mg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• HPLC-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	arsenate (As(V))	1 mg/kg to 1000 mg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• HPLC-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	dimethylarsenic acid	1 mg/kg to 1000 mg/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• HPLC-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Food (trace elements and arsenic compounds in grains and beans)	Cr	0.01 mg/kg to 10 mg/kg	15 % to 2 % (relative)	• ID-HR-ICP-MS • ICP-MS	2019-11-01
	Mn	0.1 mg/kg to 50 mg/kg	10 % to 1.5 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES • GFAAS • MP-AES	
	Fe	0.1 mg/kg to 100 mg/kg	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS • ICP-OES • GFAAS	
	Ni	0.01 mg/kg to 10 mg/kg	15 % to 2 % (relative)	• ID-ICP-MS • ICP-MS	
	Cu	0.1 mg/kg to 50 mg/kg	10 % to 1.5 % (relative)	• ID-ICP-MS • ICP-MS • ICP-OES • GFAAS	
	Zn	0.1 mg/kg to 100 mg/kg	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS • ICP-OES • GFAAS	
	As	0.005 mg/kg to 50 mg/kg	10 % to 2 % (relative)	• ICP-MS • HR-ICP-MS • GFAAS	
	Rb	0.1 mg/kg to 50 mg/kg	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS	
	Sr	0.02 mg/kg to 10 mg/kg	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS	
	Cd	0.005 mg/kg to 5 mg/kg	7 % to 2 % (relative)	• ID-ICP-MS • ICP-MS • ICP-OES • GFAAS	
	Mo	0.02 mg/kg to 10 mg/kg	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS	
	Ba	0.02 mg/kg to 10 mg/kg	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS	
	Pb	0.001 mg/kg to 10 mg/kg	15 % to 2 % (relative)	• ID-HR-ICP-MS • ICP-MS	
	Na	0.1 mg/kg to 50 mg/kg	15 % to 2 % (relative)	• ICP-OES • FAAS • Flame photometry	
	Mg	10 mg/kg to 5000 mg/kg	5 % to 1.2 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES • FAAS • MP-AES	
	K	100 mg/kg to 50000 mg/kg	5 % to 2 % (relative)	• ICP-OES • FAAS • Flame photometry	
	Ca	5 mg/kg to 5000 mg/kg	5 % to 1.5 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES • MP-AES • Flame photometry	
	P	100 mg/kg to 9000 mg/kg	10 % to 2 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES	
	arsenite (As(III))	0.005 mg/kg to 50 mg/kg (as As)	8 % to 2 % (relative)	• HPLC-ICP-MS	
	arsenate (As(V))	0.005 mg/kg to 50 mg/kg (as As)	8 % to 2 % (relative)	• HPLC-ICP-MS	
dimethylarsenic acid	0.005 mg/kg to 50 mg/kg (as As)	8 % to 2 % (relative)	• HPLC-ICP-MS		
Food (trace elements, arsenobetaine and methylmercury in fish, shellfish, and cephalopoda tissues)	Cr	0.2 mg/kg to 5 mg/kg	15 % to 3 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS • GFAAS	
	Mn	0.1 mg/kg to 5 mg/kg	10 % to 1.5 % (relative)	• ICP-MS • HR-ICP-MS • GFAAS	
	Fe	1 mg/kg to 100 mg/kg	10 % to 3 % (relative)	• ID-ICP-MS • ICP-MS • GFAAS	
	Ni	0.2 mg/kg to 20 mg/kg	15 % to 3 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS • GFAAS	
	Cu	0.2 mg/kg to 100 mg/kg	10 % to 1.5 % (relative)	• ID-ICP-MS • ICP-MS • GFAAS	
	Zn	1 mg/kg to 100 mg/kg	10 % to 1.5 % (relative)	• ID-ICP-MS • ICP-MS • ICP-OES	
	As	1 mg/kg to 100 mg/kg	10 % to 2 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES • GFAAS	

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Food (trace elements, arsenobetaine and methylmercury in fish, shellfish, and cephalopoda tissues)	Se	0.1 mg/kg to 10 mg/kg	15 % to 3 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• GFAAS</li> </ul>	2019-11-01
	Hg	0.1 mg/kg to 10 mg/kg	10 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• Heating evaporation Gold amalgamation AAS</li> </ul>	
	Na	1 mg/kg to 100 g/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-OES</li> <li>• FAAS</li> <li>• Flame photometry</li> </ul>	
	Mg	0.5 mg/kg to 100 g/kg	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• Flame photometry</li> </ul>	
	K	1 mg/kg to 100 g/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-OES</li> <li>• FAAS</li> <li>• Flame photometry</li> </ul>	
	Ca	0.1 mg/kg to 100 g/kg	15 % to 3 % (relative)	<ul style="list-style-type: none"> <li>• ICP-OES</li> <li>• FAAS</li> <li>• Flame photometry</li> </ul>	
	arsenobetaine	1 mg/kg to 100 mg/kg (as As)	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• HPLC-ICP-MS</li> <li>• ID-HPLC-ICP-MS</li> </ul>	
	methylmercury	0.1 mg/kg to 10 mg/kg (as Hg)	5 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ID-GC-ICP-MS</li> </ul>	
	Sr	0.02 mg/kg to 10 mg/kg	10 % to 1.2 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	Cd	0.01 mg/kg to 5 mg/kg	10 % to 1.5 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
Food (trace elements and arsenic compounds in algae)	P	1 g/kg to 100 g/kg	5 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• HR-ICP-MS</li> <li>• ICP-OES</li> </ul>	
	Na	0.5 g/kg to 100 g/kg	10 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-OES</li> <li>• FAAS</li> <li>• Flame photometry</li> </ul>	
	K	1 g/kg to 100 g/kg	10 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-OES</li> <li>• FAAS</li> <li>• Flame photometry</li> </ul>	
	Mg	0.1 g/kg to 100 g/kg	10 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• FAAS</li> </ul>	
	Ca	0.5 g/kg to 100 g/kg	10 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• FAAS</li> <li>• Flame photometry</li> </ul>	
	Sr	0.1 g/kg to 50 g/kg	10 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ID-ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	P	0.01 g/kg to 50 g/kg	10 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• HR-ICP-MS</li> <li>• ICP-OES</li> </ul>	
	Al	10 mg/kg to 1000 mg/kg	10 % to 3 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	As	0.5 mg/kg to 100 mg/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• HR-ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	Ba	0.5 mg/kg to 100 mg/kg	10 % to 1 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ID-ICP-MS</li> </ul>	
	Cd	0.01 mg/kg to 10 mg/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ID-ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	Co	0.1 mg/kg to 10 mg/kg	10 % to 3 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• HR-ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	Cr	0.1 mg/kg to 50 mg/kg	15 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ID-ICP-MS</li> <li>• HR-ICP-MS</li> <li>• ICP-OES</li> </ul>	
	Cu	0.1 mg/kg to 50 mg/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ID-ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	Fe	10 mg/kg to 1000 mg/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ID-ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
	Mn	0.1 mg/kg to 50 mg/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• HR-ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>	
Ni	0.1 mg/kg to 10 mg/kg	15 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ID-ICP-MS</li> <li>• ICP-OES</li> </ul>		
Pb	0.01 mg/kg to 10 mg/kg	15 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ID-ICP-MS</li> <li>• ICP-OES</li> </ul>		
Zn	0.1 mg/kg to 100 mg/kg	10 % to 2 % (relative)	<ul style="list-style-type: none"> <li>• ICP-MS</li> <li>• ID-ICP-MS</li> <li>• ICP-OES</li> <li>• GFAAS</li> </ul>		

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Food (trace elements and arsenic compounds in algae)	arsenate (As(V))	0.5 mg/kg to 100 mg/kg (as As)	10 % to 2 % (relative)	• HPLC-ICP-MS	2019-11-01 *2021-09-29
	arsenosugar-408 * (arsenosugar-SO <sub>4</sub> )	0.1 mg/kg to 10 mg/kg (as As)	10 % to 2 % (relative)	• HPLC-ICP-MS	
	arsenosugar-328 * (arsenosugar-OH)	0.1 mg/kg to 10 mg/kg (as As)	10 % to 2 % (relative)	• HPLC-ICP-MS	
	Hg	0.01 mg/kg to 0.1 mg/kg	10 % to 2 % (relative)	• ID-ICP-MS	
Environmental matrix (trace elements in plant leaves)	Al	5 mg/kg to 5000 mg/kg	5 % to 1 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES • GFAAS	
	B	1 mg/kg to 500 mg/kg	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS	
	Ba	1 mg/kg to 500 mg/kg	10 % to 1 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS • ICP-OES	
	Ca	200 mg/kg to 20000 mg/kg	5 % to 1 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES • FAAS	
	Cd	0.005 mg/kg to 50 mg/kg	10 % to 3 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS	
	Co	0.01 mg/kg to 5 mg/kg	10 % to 2 % (relative)	• ICP-MS • HR-ICP-MS	
	Cu	0.5 mg/kg to 500 mg/kg	5 % to 1 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS • ICP-OES • FAAS	
	Fe	0.5 mg/kg to 2000 mg/kg	10 % to 1 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS	
	K	100 mg/kg to 30000 mg/kg	5 % to 1 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES • FAAS	
	Li	0.02 mg/kg to 10 mg/kg	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS	
	Mg	20 mg/kg to 5000 mg/kg	5 % to 1 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES • FAAS	
	Mn	5 mg/kg to 10000 mg/kg	5 % to 1 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES • GFAAS	
	Na	0.5 mg/kg to 100 mg/kg	20 % to 1 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES • FAAS	
	Ni	0.3 mg/kg to 100 mg/kg	10 % to 1 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS • ICP-OES	
	P	150 mg/kg to 10000 mg/kg	10 % to 1 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES	
	Pb	0.01 mg/kg to 100 mg/kg	20 % to 3 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS	
	Rb	0.5 mg/kg to 200 mg/kg	10 % to 1 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS	
	Sr	0.5 mg/kg to 200 mg/kg	5 % to 1 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS • ICP-OES	
Zn	1 mg/kg to 500 mg/kg	10 % to 1 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS		

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Food (trace elements in milk and dairy products)	Ca	0.5 g/kg to 100 g/kg	10 % to 1 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES • FAAS • FAES	2019-11-01
	Fe	0.01 g/kg to 10 g/kg	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS • ICP-OES	
	K	0.1 g/kg to 100 g/kg	10 % to 1 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES • FAAS • FAES	
	Mg	0.1 g/kg to 100 g/kg	10 % to 1 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES • FAAS	
	Na	0.01 g/kg to 50 g/kg	10 % to 1 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES • FAAS • FAES	
	P	0.1 g/kg to 50 g/kg	10 % to 1 % (relative)	• ICP-MS • HR-ICP-MS • ICP-OES	
	Ba	0.05 mg/kg to 10 mg/kg	10 % to 1 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS	
	Cu	0.5 mg/kg to 100 mg/kg	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS • GFAAS	
	Mn	0.1 mg/kg to 50 mg/kg	10 % to 2 % (relative)	• ICP-MS • HR-ICP-MS • GFAAS	
	Mo	0.02 mg/kg to 10 mg/kg	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS	
	Rb	0.1 mg/kg to 500 mg/kg	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS	
	Sr	0.1 mg/kg to 50 mg/kg	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS	
	Zn	0.1 mg/kg to 1000 mg/kg	10 % to 2 % (relative)	• ID-ICP-MS • ICP-MS • HR-ICP-MS • ICP-OES	
High purity organic materials	creatinine	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	2019-11-01
	urea	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	hydrocortisone	0.990 kg/kg to 1 kg/kg	0.001 kg/kg	• Subtracting method	
	isoleucine	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	phenylalanine	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	valine	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	proline	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	alanine	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	leucine	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	lysine monohydrochloride	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	arginine	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	uric acid	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	triolin	0.990 kg/kg to 1 kg/kg	0.001 kg/kg	• qNMR • Subtraction method	
	triglyceride	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• qNMR • Subtraction method	
	glycine	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	glutamic acid	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	aspartic acid	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	tyrosine	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	histidine	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
	serine	0.990 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination	
threonine	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination		
methionine	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination		
cystine	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	• Neutralization titration • Nitrogen determination		

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Organic standard solution	C-reactive protein	10 µmol/kg to 50 µmol/kg	2 % (relative)	• ID-LC-MS	2019-11-01 *2021-09-29
	total deoxyribonucleic acid (DNA) less than 650 bp	0.5 ng/µL to 200 ng/µL	5 % (relative)	• ID-LC-MS • ICP-MS	
	C-peptide	0.08 g/L to 1 g/L	3 % (relative)	• ID-LC-MS	
	total C-peptide (mixture of C-peptide, deamidated C-peptide, and pyroglutamylated C-peptide)	0.08 g/L to 1 g/L	3 % (relative)	• ID-LC-MS	
	total ribonucleic acid (RNA) less than 1100 bases	10 ng/µL to 200 ng/µL	4 % (relative)	• ID-LC-MS • ICP-MS	
	albumin	1 g/L to 100 g/L	1.6 % (relative)	• ID-LC-MS	
	okadaic acid	0.5 µg/mL to 10 µg/mL	4 % (relative)	• qNMR • Gravimetric preparation	
	dinophysistoxin-1	0.5 µg/mL to 10 µg/mL	1.6 % (relative)	• qNMR • Gravimetric preparation	
	monoclonal antibody *	0.5 g/L to 100 g/L	2.6 % (relative)	• ID-LC-MS	
Environmental matrix (food)	okadaic acid*	0.01 mg/kg to 10 mg/kg	10 % (relative)	• LC-MS	
	dinophysistoxin-1*	0.01 mg/kg to 10 mg/kg	10 % (relative)	• LC-MS	
Steroids in serum	cortisol (hydrocortisone)	15 µg/L to 250 µg/L	3 % to 2 % (relative)	• ID-LC-MS	
	aldosterone	100 pg/mL to 1000 pg/mL	5 % (relative)	• ID-LC-MS	



Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Molecular weight of polymer	polystyrene latex nanoparticle (light scattering intensity averaged diameter)	100 nm to 200 nm	1 % (relative)	• Dynamic light scattering (DLS)	2019-11-01 *2021-09-29
	low molar mass monodisperse polystyrene (number-average molecular mass)	8000 to 10000	1 % (relative)	• MALDI-TOFMS	
	poly (ethylene glycol) nonylphenyl ether (mass-average molecular mass, number-average molecular mass)	600 to 700	3 % (relative)	• Supercritical Fluid Chromatography (SFC)	
	poly (ethylene glycol) nonylphenyl ether (mass fraction and mole fraction of each degree of polymerization)	$1 \times 10^{-4}$ to 1	5 % (relative)	• Supercritical fluid chromatography (SFC)	
	polydisperse polystyrene (mass-average molar mass)	200,000 to 300,000	5 % (relative)	• Static light scattering (SLS) and SEC-MALS	
	polydisperse polystyrene (number-average molar mass)	60,000 to 150,000 (polydispersity range is priority to others.)	5 % (relative)	• SEC-MALS	
	polydisperse polystyrene (polydispersity)	2 to 3	5 % (relative)	• SEC-MALS	
	polystyrene (mass-average molecular mass, number-average molecular mass, peak-average molecular mass)	400 to 2600	0.5 % (relative)	• Supercritical fluid chromatography (SFC)	
	polystyrene (polydispersity)	1.05 to 1.20	1.5 % (relative)	• Supercritical fluid chromatography (SFC)	
	polystyrene (mass fraction and mole fraction of each degree of polymerization)	$2 \times 10^{-5}$ to 1	2 % (relative)	• Supercritical fluid chromatography (SFC)	
	poly (ethylene glycol) (mass-average molecular mass, number-average molecular mass)	350 to 1700	1 % (relative)	• Supercritical fluid chromatography (SFC)	
	poly (ethylene glycol) (mass fraction and mole fraction of each degree of polymerization)	$3 \times 10^{-5}$ to 1	1 % (relative)	• Supercritical fluid chromatography (SFC)	
	monodisperse polystyrene (mass-average molar mass)	$1 \times 10^5$ to $1 \times 10^6$	5 % (relative)	• Static light scattering (SLS)	
	poly (ethylene glycol) 23mer (mass fraction)	0.99 to 1	0.1 % (relative)	• Supercritical fluid chromatography (SFC)	
Polymer reference material (polymer: organic compounds)	polybrominated diphenyl ether in plastics (polystyrene, polyvinyl chloride)	50 mg/kg to 1500 mg/kg	5 % to 2 % (relative)	• ID-GC-MS and • Standard addition method (HPLC)	
	plasticizers ( dimethyl phthalate, diethyl phthalate, di- <i>n</i> -propyl phthalate, di- <i>i</i> -butyl phthalate, di- <i>n</i> -butyl phthalate, di- <i>n</i> -pentyl phthalate, di- <i>n</i> -hexyl phthalate, dicyclohexyl phthalate, di- <i>n</i> -heptyl phthalate, butyl benzyl phthalate, bis(2-ethylhexyl) phthalate, bis( <i>n</i> -octyl) phthalate) in plastics (polystyrene, polypropylene, polyvinyl chloride)	50 mg/kg to 1500 mg/kg	3 % to 1.5 % (relative)	• ID-GC-MS and • Standard addition method (HPLC)	
Polymer reference material (Raman shift) *	Raman shift	$300 \text{ cm}^{-1}$ ~ $3500 \text{ cm}^{-1}$	$0.28 \text{ cm}^{-1}$	• Raman spectroscopy	
Polymer (perfluoroalkyl substances in polymer)	perfluorooctanesulfonic acid and its salts	10 mg/kg to 100 mg/kg	20 % to 10 % (relative)	• ID-LC-MS/MS	
Positron lifetime	positron lifetime in solids	0.1 ns to 20 ns	2 % (relative)	• Positron annihilation lifetime spectroscopy	
Steel	chromium	mass fraction 20 % to 40 %	0.1 % (relative)	• Titration • EPMA	
	nickel	mass fraction 15 % to 70 %	0.1 % (relative)	• Titration • EPMA	
	iron	mass fraction 5 % to 70 %	0.1 % (relative)	• Titration • EPMA	
	carbon	mass fraction 0.05 % to 1.0 %	10.0 % to 1.0 % (relative)	• Gravimetric analysis • EPMA	

Subcategory	Measurand	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	Analytical Method	Date of Accreditation
Thin film	film thickness	each layer 1 nm to 200 nm (total film thickness 3 nm to 200 nm or less)	0.27 % to 0.06 % (relative)	X-ray reflectivity	2019-11-01
	arsenic	0.01 g/kg to 1.6 g/kg	2.4 % (relative)	<ul style="list-style-type: none"> <li>• Instrumental Neutron Activation Analysis</li> <li>• ICP-MS</li> </ul>	
Thick film	film thickness	70 nm to 6000 nm	1.2 % (relative)	<ul style="list-style-type: none"> <li>• SEM</li> </ul>	
	gold	area density 1.3 $\mu\text{g}/\text{mm}^2$ to 5.8 $\mu\text{g}/\text{mm}^2$	0.3 % (relative)	<ul style="list-style-type: none"> <li>• ICP-OES</li> <li>• ICP-MS</li> <li>• Length measurement with optical scanner</li> <li>• X-ray Fluorescence</li> </ul>	
	nickel	area density 4 $\mu\text{g}/\text{mm}^2$ to 52 $\mu\text{g}/\text{mm}^2$	0.3 % (relative)	<ul style="list-style-type: none"> <li>• ICP-OES</li> <li>• ICP-MS</li> <li>• ID-ICP-MS</li> <li>• Length measurement with optical scanner</li> <li>• X-ray Fluorescence</li> </ul>	
	copper	area density 4 $\mu\text{g}/\text{mm}^2$ to 52 $\mu\text{g}/\text{mm}^2$	0.4 % (relative)	<ul style="list-style-type: none"> <li>• ICP-OES</li> <li>• ICP-MS</li> <li>• ID-ICP-MS</li> <li>• Length measurement with optical scanner</li> <li>• X-ray Fluorescence</li> </ul>	

(End of Attachment)