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## Certificate of Accreditation

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

Accreditation Identification: ASNITE 0001 Calibration-Chem

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/IEC 17025:2017\*

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

Effective Date of Accreditation: 2019-11-01

Expiry Date of Accreditation: 2024-10-31

Date of Initial Accreditation: 2003-10-09

SAITO Kazunori

Chief Executive, International Accreditation Japan (IAJapan)

National Institute of Technology and Evaluation

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- International Accreditation Japan (IAJapan) is a laboratory 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 for the traceability of measurement for MRA purpose.
  - This laboratory fulfills ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation means this laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).
  - The latest accreditation information is publicly available on IAJapan Website as an accreditation certificate.

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurement Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
Standard gases	high purity nitrogen monoxide (NO)		•Subtraction method	0.99 mol/mol to 1 mol/mol	1.0 % to 0.01 % (relative)
	impurities in NO	NO <sub>2</sub>	•FT-IR	10 µmol/mol to 10000 µmol/mol	10 % to 2.5 % (relative)
		N <sub>2</sub>	•GC-TCD	11 µmol/mol to 5000 µmol/mol	100 % to 2.5 % (relative)
		O <sub>2</sub>	•GC-TCD	11 µmol/mol to 5000 µmol/mol	100 % to 2.5 % (relative)
		N <sub>2</sub> O	•FT-IR •GC-TCD	7.5 µmol/mol to 11000 µmol/mol	10 % to 0.5 % (relative)
		CH <sub>4</sub>	•FT-IR •GC-FID	2 µmol/mol to 11000 µmol/mol	100 % to 0.5 % (relative)
		C <sub>3</sub> H <sub>8</sub>	•GC-FID	2 µmol/mol to 11000 µmol/mol	100 % to 0.5 % (relative)
		H <sub>2</sub> O*	•FT-IR	21 µmol/mol to 100 µmol/mol	100 % to 0.5% (relative)
		CO <sub>2</sub> *	•FT-IR	10 µmol/mol to 100 µmol/mol	100 % to 0.5% (relative)
	high purity sulfur dioxide (SO <sub>2</sub> )		•Subtraction method	0.99 mol/mol to 1 mol/mol	1.0 % to 0.01 % (relative)
	impurities in SO <sub>2</sub>	CO <sub>2</sub>	•GC-TCD •FT-IR	1 µmol/mol to 15000 µmol/mol	100 % to 0.5 % (relative)
		N <sub>2</sub>	•GC-TCD	1 µmol/mol to 15000 µmol/mol	100 % to 0.5 % (relative)
		O <sub>2</sub>	•GC-TCD	1 µmol/mol to 15000 µmol/mol	100 % to 0.5 % (relative)
		CH <sub>4</sub>	•GC-FID	0.09 µmol/mol to 11000 µmol/mol	100 % to 0.5 % (relative)
		C <sub>3</sub> H <sub>8</sub>	•GC-FID	0.04 µmol/mol to 11000 µmol/mol	100 % to 0.5 % (relative)
		H <sub>2</sub> O*	•FT-IR	24 µmol/mol to 100 µmol/mol	100 % to 0.5 % (relative)
	high purity methane (CH <sub>4</sub> )		•Subtracting method	0.99 mol/mol to 1 mol/mol	1 mmol/mol to 0.0005 mmol/mol
	impurities in CH <sub>4</sub>	N <sub>2</sub>	•GC-PID •GC-TCD	0.1 µmol/mol to 100 µmol/mol	80 % to 2 % (relative)
		O <sub>2</sub>	•GC-PID •GC-TCD	0.1 µmol/mol to 100 µmol/mol	60 % to 2 % (relative)
		Ar	•GC-PID •GC-TCD	0.1 µmol/mol to 100 µmol/mol	40 % to 2 % (relative)
CO		•GC-PID •GC-TCD	0.04 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)	
CO <sub>2</sub>		•GC-PID •GC-TCD	0.04 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)	
C <sub>2</sub> H <sub>6</sub>		•GC-FID	0.02 µmol/mol to 100 µmol/mol	100 % to 2 % (relative)	
H <sub>2</sub>		•GC-PID •GC-TCD	0.07 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)	
hexane		•GC-FID	0.02 µmol/mol to 20 µmol/mol	100 % to 0.6 % (relative)	
H <sub>2</sub> O		•Dew point measuring method	0.1 µmol/mol to 130 µmol/mol	70 % to 5 % (relative)	

2019-11-01  
\*2021-09-29

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurement Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
Standard gases	high purity propane (C <sub>3</sub> H <sub>8</sub> )		•Subtracting method	0.99 mol/mol to 1 mol/mol	1 mmol/mol to 0.001 mmol/mol
	impurities in C <sub>3</sub> H <sub>8</sub>	N <sub>2</sub>	•GC-TCD	3 µmol/mol to 100 µmol/mol	80 % to 2 % (relative)
		O <sub>2</sub>	•GC-TCD	0.1 µmol/mol to 100 µmol/mol	60 % to 2 % (relative)
		Ar	•GC-TCD	0.1 µmol/mol to 100 µmol/mol	40 % to 2 % (relative)
		CO <sub>2</sub>	•GC-TCD	0.1 µmol/mol to 100 µmol/mol	50 % to 2 % (relative)
		CH <sub>4</sub>	•GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		C <sub>2</sub> H <sub>6</sub>	•GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		propylene	•GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		butane	•GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		isobutane	•GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		H <sub>2</sub> O	•Dew point measuring method	10 µmol/mol to 1000 µmol/mol	70 % to 20 % (relative)
	high purity carbon dioxide (CO <sub>2</sub> )		•Subtracting method	0.99 mol/mol to 1 mol/mol	1 mmol/mol to 0.002 mmol/mol
	impurities in CO <sub>2</sub>	N <sub>2</sub>	•GC-TCD	0.1 µmol/mol to 100 µmol/mol	100 % to 0.5 % (relative)
		O <sub>2</sub>	•GC-TCD	0.1 µmol/mol to 100 µmol/mol	100 % to 0.5 % (relative)
		H <sub>2</sub>	•GC-TCD	0.8 µmol/mol to 100 µmol/mol	100 % to 0.5 % (relative)
		He	•GC-TCD	0.8 µmol/mol to 100 µmol/mol	100 % to 0.5 % (relative)
		CH <sub>4</sub>	•GC-FID	0.004 µmol/mol to 1 µmol/mol	100 % to 1 % (relative)
		C <sub>3</sub> H <sub>8</sub>	•GC-FID	0.004 µmol/mol to 1 µmol/mol	100 % to 1 % (relative)
		CO	•GC-FID	0.05 µmol/mol to 1 µmol/mol	100 % to 0.5 % (relative)
		H <sub>2</sub> O	• Capacitance-type moisture analyzer	0.9 µmol/mol to 130 µmol/mol	100 % to 30 % (relative)
	high purity carbon monoxide (CO)		•Subtracting method	0.99 mol/mol to 1 mol/mol	1 mmol/mol to 0.02 mmol/mol
	impurities in CO	N <sub>2</sub>	•GC-TCD	1.5 µmol/mol to 100 µmol/mol	100 % to 0.5 % (relative)
		O <sub>2</sub>	•GC-TCD	2.1 µmol/mol to 100 µmol/mol	100 % to 0.5 % (relative)
		H <sub>2</sub>	•GC-TCD	0.9 µmol/mol to 100 µmol/mol	100 % to 0.5 % (relative)
		He	•GC-TCD	0.4 µmol/mol to 100 µmol/mol	100 % to 0.5 % (relative)
		CH <sub>4</sub>	•GC-TCD	1.5 µmol/mol to 100 µmol/mol	100 % to 0.5 % (relative)
		CO <sub>2</sub>	•GC-TCD	0.3 µmol/mol to 100 µmol/mol	100 % to 0.5 % (relative)
H <sub>2</sub> O		•Quartz-crystal oscillator sample cell	0.36 µmol/mol to 100 µmol/mol	100 % to 0.5 % (relative)	

2019-11-01

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurement Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
Standard gases	high purity oxygen (O <sub>2</sub> )		• Subtracting method • Magnetopneumatic oxygen analyzer	0.99 mol/mol to 1 mol/mol	1 mmol/mol to 0.0005 mmol/mol
	impurities in O <sub>2</sub>	Ar	• GC-TCD	1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		N <sub>2</sub>	• GC-TCD	1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		CH <sub>4</sub>	• FT-IR	0.05 µmol/mol to 1 µmol/mol	30 % to 5 % (relative)
		CO	• FT-IR	0.06 µmol/mol to 1 µmol/mol	30 % to 5 % (relative)
		CO <sub>2</sub>	• FT-IR	0.05 µmol/mol to 1 µmol/mol	30 % to 5 % (relative)
		N <sub>2</sub> O	• FT-IR	0.05 µmol/mol to 1 µmol/mol	30 % to 5 % (relative)
		H <sub>2</sub> O	• Dew point measuring method	0.5 µmol/mol to 130 µmol/mol	70 % to 30 % (relative)
	high purity vinyl chloride		• Subtracting method	0.99 mol/mol to 1 mol/mol	5 mmol/mol to 0.01 mmol/mol
	impurities in vinyl chloride	N <sub>2</sub>	• GC-TCD	1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		O <sub>2</sub>	• GC-TCD	1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		Ar	• GC-TCD	1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		CO <sub>2</sub>	• GC-TCD	1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		methyl chloride	• GC-FID	1 µmol/mol to 200 µmol/mol	30 % to 2 % (relative)
		ethyl chloride	• GC-FID	1 µmol/mol to 100 µmol/mol	20 % to 2 % (relative)
		H <sub>2</sub> O	• Dew point measuring method	10 µmol/mol to 1000 µmol/mol	70 % to 20 % (relative)
	high purity 1,3-butadiene		• Subtracting method	0.98 mol/mol to 1 mol/mol	20 mmol/mol to 1 mmol/mol
	impurities in 1,3-butadiene	N <sub>2</sub>	• GC-TCD	5 µmol/mol to 1000 µmol/mol	30 % to 2 % (relative)
		O <sub>2</sub>	• GC-TCD	5 µmol/mol to 1000 µmol/mol	30 % to 2 % (relative)
		Ar	• GC-TCD	5 µmol/mol to 1000 µmol/mol	30 % to 2 % (relative)
		CO <sub>2</sub>	• GC-TCD	5 µmol/mol to 1000 µmol/mol	30 % to 2 % (relative)
butane		• GC-FID	1 µmol/mol to 500 µmol/mol	20 % to 2 % (relative)	
isobutane		• GC-FID	1 µmol/mol to 500 µmol/mol	20 % to 2 % (relative)	
1-butene		• GC-FID	1 µmol/mol to 1000 µmol/mol	20 % to 2 % (relative)	
<i>trans</i> -2-butene		• GC-FID	1 µmol/mol to 7000 µmol/mol	20 % to 2 % (relative)	
<i>cis</i> -2-butene		• GC-FID	1 µmol/mol to 8000 µmol/mol	20 % to 2 % (relative)	
isobutylene		• GC-FID	1 µmol/mol to 1000 µmol/mol	20 % to 2 % (relative)	
4-vinyl-1-cyclohexene (1,3-butadiene dimer)		• GC-FID	1 µmol/mol to 2150 µmol/mol	60 % to 30 % (relative)	
H <sub>2</sub> O		• Dew point measuring method	10 µmol/mol to 1000 µmol/mol	70 % to 20 % (relative)	

2019-11-01

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurement Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
Standard gases	high purity ethane*		• Subtracting method	0.99 mol/mol to 1 mol/mol	1 mmol/mol to 0.001 mmol/mol
	impurities in ethane*	N <sub>2</sub>	• GC-TCD	0.1 µmol/mol to 100 µmol/mol	80 % to 2 % (relative)
		O <sub>2</sub>	• GC-TCD	0.1 µmol/mol to 100 µmol/mol	60 % to 2 % (relative)
		CO <sub>2</sub>	• GC-TCD	0.1 µmol/mol to 100 µmol/mol	50 % to 2 % (relative)
		methane	• GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		ethylene	• GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		propane	• GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		propylene	• GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		butane	• GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		H <sub>2</sub> O	• Dew point measuring method	10 µmol/mol to 1000 µmol/mol	70 % to 20 % (relative)
	high purity isobutane*		• Subtracting method	0.99 mol/mol to 1 mol/mol	2 mmol/mol to 0.005 mmol/mol
	impurities in isobutane*	N <sub>2</sub>	• GC-TCD	1.76 µmol/mol to 100 µmol/mol	100 % to 2 % (relative)
		O <sub>2</sub>	• GC-TCD	5 µmol/mol to 100 µmol/mol	100 % to 2 % (relative)
		CO <sub>2</sub>	• GC-TCD	11 µmol/mol to 100 µmol/mol	100 % to 2 % (relative)
		propane	• GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		butane	• GC-FID	0.1 µmol/mol to 200 µmol/mol	30 % to 2 % (relative)
		isobutene	• GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		<i>cis</i> -2-butene	• GC-FID	0.1 µmol/mol to 500 µmol/mol	30 % to 2 % (relative)
		<i>trans</i> -2-butene	• GC-FID	0.1 µmol/mol to 500 µmol/mol	30 % to 2 % (relative)
		pentane	• GC-FID	3 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		H <sub>2</sub> O	• Dew point measuring method	50 µmol/mol to 3000 µmol/mol	70 % to 10 % (relative)
	high purity butane*		• Subtracting method	0.99 mol/mol to 1 mol/mol	2 mmol/mol to 0.005 mmol/mol
	impurities in butane*	N <sub>2</sub>	• GC-TCD	1.76 µmol/mol to 100 µmol/mol	100 % to 2 % (relative)
		O <sub>2</sub>	• GC-TCD	1.7 µmol/mol to 100 µmol/mol	100 % to 2 % (relative)
		CO <sub>2</sub>	• GC-TCD	11 µmol/mol to 100 µmol/mol	100 % to 2 % (relative)
		propane	• GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)
		isobutane	• GC-FID	1 µmol/mol to 200 µmol/mol	30 % to 2 % (relative)
isobutene		• GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)	
<i>cis</i> -2-butene		• GC-FID	0.1 µmol/mol to 500 µmol/mol	30 % to 2 % (relative)	
<i>trans</i> -2-butene		• GC-FID	0.1 µmol/mol to 500 µmol/mol	30 % to 2 % (relative)	
pentane		• GC-FID	0.1 µmol/mol to 100 µmol/mol	30 % to 2 % (relative)	
H <sub>2</sub> O		• Dew point measuring method	50 µmol/mol to 3000 µmol/mol	70 % to 10 % (relative)	

\*2021-09-29

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation	
	Instrument or Artefact	Calibration Methods *1	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)		
Standard gases	high purity isopentane*	• Post-column reaction gas chromatography	0.99 mol/mol to 1 mol/mol	5 mmol/mol to 0.01 mmol/mol	2019-11-01 *2021-09-29	
	high purity pentane*	• Post-column reaction gas chromatography	0.99 mol/mol to 1 mol/mol	5 mmol/mol to 0.01 mmol/mol		
	nitrogen*	• Subtracting method	0.999 mol/mol to 1 mol/mol	1 mmol/mol to 0.004 mmol/mol		
	impurities in nitrogen*	O <sub>2</sub> + Ar	• GC-TCD	1 µmol/mol to 10 µmol/mol		100 % to 30 % (relative)
		carbon dioxide	• GC-FID	0.1 µmol/mol to 10 µmol/mol		100 % to 30 % (relative)
		total hydrocarbons	• Total hydrocarbon analyzer	0.005 µmol/mol to 10 µmol/mol		100 % to 30 % (relative)
		H <sub>2</sub> O	• Dew point measuring method	1.4 µmol/mol to 10 µmol/mol		100 % to 30 % (relative)
	O <sub>2</sub> /N <sub>2</sub>	• GC-TCD	5 µmol/mol to 5 mmol/mol	1 % to 0.1 % (relative)		
	N <sub>2</sub> O/N <sub>2</sub> or N <sub>2</sub> O/air	• GC-TCD • GC-ECD	0.2 µmol/mol to 0.02 mol/mol	0.2 % to 0.1 % (relative)		
	CH <sub>4</sub> /air	• CRDS	1600 nmol/mol to 2600 nmol/mol	1.3 nmol/mol		
	hexane/N <sub>2</sub>	• GC-FID	20 µmol/mol to 600 µmol/mol	2 % to 0.3 % (relative)		
	hexane/CH <sub>4</sub>	• GC-FID	20 µmol/mol to 600 µmol/mol	2 % to 0.3 % (relative)		
	N <sub>2</sub> +CO <sub>2</sub> +C <sub>3</sub> H <sub>8</sub> /CH <sub>4</sub>	N <sub>2</sub> : • GC-TCD CO <sub>2</sub> : • GC-TCD C <sub>3</sub> H <sub>8</sub> : • GC-TCD • GC-FID	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		
	synthetic natural gas	N <sub>2</sub> : • GC-TCD CO <sub>2</sub> : • GC-TCD C <sub>2</sub> H <sub>6</sub> : • GC-FID • GC-TCD C <sub>3</sub> H <sub>8</sub> : • GC-FID • GC-TCD <i>n</i> -C <sub>4</sub> H <sub>10</sub> : • GC-FID • GC-TCD <i>iso</i> -C <sub>4</sub> H <sub>10</sub> : • GC-FID • GC-TCD CH <sub>4</sub> : • GC-TCD • subtracting method	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)		
	HCHO/N <sub>2</sub>	• FT-IR	1 µmol/mol to 8 µmol/mol	2.5 % to 1 % (relative)		
	N <sub>2</sub> /Ar*	• GC-MS	1 µmol/mol to 200 µmol/mol	10 % to 0.5 % (relative)		
	CO <sub>2</sub> /air*	• CRDS	150 µmol/mol to 800 µmol/mol	0.02 µmol/mol to 0.1 µmol/mol		

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
Inorganic standard solution	Mg	• Chelatometric titration	0.8 g/kg to 1.2 g/kg	0.16 % (relative)	2019-11-01 *2021-09-29
	Al	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Cu	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Zn	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Fe	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Ni	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Sr	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.08 % (relative)	
	V	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.08 % (relative)	
	Mn	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Mo	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Co	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Cd	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Ga	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	In	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Pb	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Bi	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Ba	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.16 % (relative)	
	Cr	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.06 % (relative)	
	Tl	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.28 % (relative)	
	Sn	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.14 % (relative)	
	Na	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	K	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Li	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Rb	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Cs	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	As	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Sb	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Be	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.18 % (relative)	
	Zr	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Ag	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
	Ca	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.10 % (relative)	
	Hg	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.10 % (relative)	
	Se	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.12 % (relative)	
	B	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.12 % (relative)	
	Te	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.13 % (relative)	
	Si	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.28 % (relative)	
	La*	• Chelatometric titration	0.8 g/kg to 1.2 g/kg	0.13 % (relative)	
	Ti*	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.19 % (relative)	
	Y*	• Chelatometric titration	0.8 g/kg to 1.2 g/kg	0.13 % (relative)	
	chloride ion	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)	
nitrite ion	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.18 % (relative)		
nitrate ion	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.15 % (relative)		
phosphate ion	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.18 % (relative)		
bromide ion	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)		
iodide ion	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.04 % (relative)		
sulfate ion	• IC	0.8 g/kg to 1.2 g/kg	0.12 % (relative)		
cyanide ion	• Complexometric titration	0.8 g/kg to 1.2 g/kg	1.1 % (relative)		

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
Inorganic standard solution	chlorate ion	• Gravimetric titration	0.8 g/kg to 1.2 g/kg	0.15 % (relative)	2019-11-01 *2021-09-29
	bromate ion	• Gravimetric titration	1.6 g/kg to 2.4 g/kg	0.14 % (relative)	
	ammonium ion*	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.13 % (relative)	
	total organic carbon	• Gravimetric preparation	0.8 g/kg to 1.2 g/kg	0.16 % (relative)	
Inorganic standard solution (Isotopic standard)	<sup>206</sup> Pb/ <sup>204</sup> Pb (Isotopic ratio)	• MC-ICP-MS	14 mol/mol to 22 mol/mol	0.025 % (relative)	
	<sup>207</sup> Pb/ <sup>204</sup> Pb (Isotopic ratio)	• MC-ICP-MS	13 mol/mol to 17 mol/mol	0.023 % (relative)	
	<sup>208</sup> Pb/ <sup>204</sup> Pb (Isotopic ratio)	• MC-ICP-MS	36 mol/mol to 40 mol/mol	0.023 % (relative)	
	<sup>208</sup> Pb/ <sup>206</sup> Pb (Isotopic ratio)	• MC-ICP-MS	1.8 mol/mol to 2.2 mol/mol	0.0062 % (relative)	
	<sup>207</sup> Pb/ <sup>206</sup> Pb (Isotopic ratio)	• MC-ICP-MS	0.8 mol/mol to 1.0 mol/mol	0.0042 % (relative)	
	<sup>204</sup> Pb (Isotopic abundance)	• MC-ICP-MS	0.012 mol/mol to 0.015 mol/mol	0.029 % (relative)	
	<sup>206</sup> Pb (Isotopic abundance)	• MC-ICP-MS	0.24 mol/mol to 0.28 mol/mol	0.0036 % (relative)	
	<sup>207</sup> Pb (Isotopic abundance)	• MC-ICP-MS	0.20 mol/mol to 0.23 mol/mol	0.0047 % (relative)	
	<sup>208</sup> Pb (Isotopic abundance)	• MC-ICP-MS	0.51 mol/mol to 0.53 mol/mol	0.0031 % (relative)	
Pb (Molar mass)	• MC-ICP-MS	207.1 g/mol to 207.3 g/mol	0.000014 % (relative)		
Inorganic standard solution (Isotopic standard)*	<sup>56</sup> Fe/ <sup>54</sup> Fe (Isotopic ratio)	• MC-ICP-MS	11 mol/mol to 20 mol/mol	0.041 % (relative)	
	<sup>57</sup> Fe/ <sup>54</sup> Fe (Isotopic ratio)	• MC-ICP-MS	0.25 mol/mol to 0.47 mol/mol	0.063 % (relative)	
	<sup>58</sup> Fe/ <sup>54</sup> Fe (Isotopic ratio)	• MC-ICP-MS	0.034 mol/mol to 0.063 mol/mol	0.11 % (relative)	
	<sup>54</sup> Fe (Isotopic abundance)	• MC-ICP-MS	0.041 mol/mol to 0.076 mol/mol	0.038 % (relative)	
	<sup>56</sup> Fe (Isotopic abundance)	• MC-ICP-MS	0.064 mol/mol to 1.2 mol/mol	0.0037 % (relative)	
	<sup>57</sup> Fe (Isotopic abundance)	• MC-ICP-MS	0.015 mol/mol to 0.028 mol/mol	0.071 % (relative)	
	<sup>58</sup> Fe (Isotopic abundance)	• MC-ICP-MS	0.0020 mol/mol to 0.0037 mol/mol	0.11 % (relative)	
	Fe (Molar mass)	• MC-ICP-MS	55.29 g/mol to 56.4 g/mol	0.000068 % (relative)	



Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
pH standard solution	pH	• Harned cell method	1.18 to 10.51	0.003	2019-11-01 *2021-09-29
Electrolytic conductivity standard solution	Electrolytic conductivity	• Impedance measurement	0.05 S/m to 15 S/m	0.15 % to 0.48 % (relative)	
		• Impedance measurement	0.005 S/m to 0.05 S/m*	0.61 % (relative)	
High purity inorganic material (Potassium hydrogen phthalate)	acid	• Coulometric titration	99.9 % to 100.1 % (mass fraction as potassium hydrogen phthalate)	0.012 % to 0.015 %	
High purity inorganic material (Potassium dichromate)	oxidant	• Coulometric titration	99.9 % to 100.1 % (mass fraction as potassium dichromate)	0.010 % to 0.012 %	
High purity inorganic material (Arsenic(III) trioxide)	reductant	• Coulometric titration	99.9 % to 100.1 % (mass fraction as arsenic(III) trioxide)	0.014 % to 0.020 %	
High purity inorganic material (Sodium carbonate)	base	• Coulometric titration • Gravimetric titration	99.9 % to 100.1 % (mass fraction as sodium carbonate)	0.01 % to 0.02 %	
High purity inorganic material (Potassium iodate)	oxidant	• Coulometric titration • Gravimetric titration	99.9 % to 100.1 % (mass fraction as potassium iodate)	0.014 % to 0.020 %	
High purity inorganic material (Sodium oxalate)	reductant	• Coulometric titration • Gravimetric titration	99.9 % to 100.1 % (mass fraction as sodium oxalate)	0.023 % to 0.025 %	
Heavy metals in polymer	Cd	• ICP-OES • ICP-MS • ID-ICP-MS	5 mg/kg to 10000 mg/kg	0.5 % to 2.0 % (relative)	
	Cr	• ICP-OES • ICP-MS • ID-ICP-MS	10 mg/kg to 10000 mg/kg	0.5 % to 2.0 % (relative)	
	Hg	• ICP-OES • ICP-MS • ID-ICP-MS	10 mg/kg to 10000 mg/kg	0.5 % to 2.0 % (relative)	
	Pb	• ICP-OES • ICP-MS • ID-ICP-MS	10 mg/kg to 10000 mg/kg	0.5 % to 2.0 % (relative)	
	Br	• Instrumental Neutron Activation Analysis • ID-ICP-MS	50 mg/kg to 10000 mg/kg	2.0 % to 5.0 % (relative)	
Minor elements in metals and alloys (lead-free solder)	Pb	• ID-ICP-MS	100 mg/kg to 2000 mg/kg	0.8 % to 1.6 % (relative)	
	Ag	• ID-ICP-MS	2.8 % to 3.2 % (mass fraction)	0.8 % to 1.6 % (relative)	
	Cu	• ID-ICP-MS	0.3 % to 0.7 % (mass fraction)	0.5 % to 1.0 % (relative)	
High purity inorganic material (Sodium chloride)	Cl	• Coulometric titration	99.9 % to 100.1 % (mass fraction as sodium chloride)	0.03 % to 0.05 %	
High purity inorganic material (Ammonium chloride)	ammonium ion	• Coulometric titration	99.9 % to 100.1 % (mass fraction as ammonium chloride)	0.034 % to 0.070 %	
	Cl	• Gravimetric titration	99.9 % to 100.1 % (mass fraction as ammonium chloride)	0.054 % to 0.080 %	
High purity inorganic material (Amidosulfuric acid)	acid	• Coulometric titration	99.9 % to 100.1 % (mass fraction as amidosulfuric acid)	0.008 % to 0.012 %	
	N	• Coulometric titration	99.9 % to 100.1 % (mass fraction as amidosulfuric acid)	0.025 % to 0.040 %	
Hydrochloric acid	acid	• Coulometric titration	0.05 mol/kg to 2 mol/kg	0.016 % to 0.027 % (relative)	
High purity inorganic material (Tris(hydroxymethyl) aminomethane)	base	• Coulometric titration	99.8 % to 100.2 % (mass fraction as tris(hydroxymethyl)aminomethane)	0.026 %	
High purity inorganic material (Calcium carbonate)	Ca	• Chelatometric titration	99.5 % to 100.5 % (mass fraction as calcium carbonate)	0.030 %	
High purity inorganic material (Zinc)	Zn	• Subtracting method with impurity analysis	99.5 % to 100.0 % (mass fraction as zinc)	0.008 %	
	Zn (molar mass)	• ICP-MS	65.36 g/mol to 65.40 g/mol	0.0018 % (relative)	

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
High purity organic materials	ethanol	• Freezing point depression method	0.998 mol/mol to 1 mol/mol	0.002 mol/mol to 0.0004 mol/mol	2019-11-01
	toluene	• Freezing point depression method	0.998 mol/mol to 1 mol/mol	0.003 mol/mol to 0.00006 mol/mol	
	1,2-dichloroethane	• Freezing point depression method	0.998 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0001 mol/mol	
	benzene	• Freezing point depression method	0.998 mol/mol to 1 mol/mol	0.001 mol/mol to 0.00002 mol/mol	
	<i>o</i> -xylene	• Freezing point depression method	0.998 mol/mol to 1 mol/mol	0.001 mol/mol to 0.00002 mol/mol	
	ethylbenzene	• Freezing point depression method	0.998 mol/mol to 1 mol/mol	0.0002 mol/mol to 0.002 mol/mol	
	cholesterol	• Freezing point depression method	0.995 kg/kg to 1 kg/kg	0.001 kg/kg	
	<i>m</i> -xylene	• Freezing point depression method	0.997 mol/mol to 1 mol/mol	0.001 mol/mol to 0.00015 mol/mol	
	diethyl phthalate	• Freezing point depression method	0.997 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0002 mol/mol	
	chloroform	• Freezing point depression method	0.995 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0002 mol/mol	
	<i>p</i> -xylene	• Freezing point depression method	0.995 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0001 mol/mol	
	bromoform	• Freezing point depression method	0.995 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0002 mol/mol	
	bromodichloromethane	• Freezing point depression method	0.995 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0002 mol/mol	
	bisphenol A	• Freezing point depression method	0.995 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0006 mol/mol	
	dibromochloromethane	• Freezing point depression method	0.995 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0002 mol/mol	
	<i>trans</i> -1,2-dichloroethylene	• Freezing point depression method	0.995 mol/mol to 1 mol/mol	0.001 mol/mol to 0.0002 mol/mol	
	trichloroethylene	• Freezing point depression method	0.995 mol/mol to 1 mol/mol	0.002 mol/mol	
	tetrachloroethylene	• Freezing point depression method	0.995 mol/mol to 1 mol/mol	0.005 mol/mol to 0.0001 mol/mol	
	1,1,1-trichloroethane	• Freezing point depression method	0.995 mol/mol to 1 mol/mol	0.005 mol/mol to 0.0004 mol/mol	
	<i>cis</i> -1,2-dichloroethylene	• Freezing point depression method	0.99 mol/mol to 1 mol/mol	0.005 mol/mol to 0.0007 mol/mol	
<i>cis</i> -1,3-dichloropropene	• Freezing point depression method	0.995 mol/mol to 1 mol/mol	0.005 mol/mol to 0.003 mol/mol		
1,4-dichlorobenzene	• Freezing point depression method	0.995 mol/mol to 1 mol/mol	0.005 mol/mol to 0.0003 mol/mol		
styrene	• Freezing point depression method • Subtracting method	0.99 kg/kg to 1.00 kg/kg	0.01 kg/kg to 0.0005 kg/kg		

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

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

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
Organic standard solution	<i>p,p'</i> -DDT/2,2,4-trimethylpentane	<ul style="list-style-type: none"> <li>Freezing point depression method</li> <li>HPLC-UV</li> <li>Gravimetric preparation</li> </ul>	0.05 mg/kg to 20 mg/kg	7 % (relative)	2019-11-01 *2021-09-29
	<i>p,p'</i> -DDE/2,2,4-trimethylpentane	<ul style="list-style-type: none"> <li>Freezing point depression method</li> <li>GC-FID</li> <li>Gravimetric preparation</li> </ul>	0.5 mg/kg to 20 mg/kg	2 % (relative)	
	$\gamma$ -HCH/2,2,4-trimethylpentane	<ul style="list-style-type: none"> <li>Subtracting method (GC-FID)</li> <li>Gravimetric preparation</li> </ul>	0.03 mg/kg to 20 mg/kg	1 % (relative)	
	<i>p,p'</i> -DDT + <i>p,p'</i> -DDE + <i>p,p'</i> -DDD + $\gamma$ -HCH /2,2,4-trimethylpentane	<ul style="list-style-type: none"> <li>Freezing point depression method</li> <li>HPLC-UV</li> <li>GC-FID</li> <li>Gravimetric preparation</li> </ul>	<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)	
	PCB28/2,2,4-trimethylpentane	<ul style="list-style-type: none"> <li>Freezing point depression method</li> <li>GC-FID</li> <li>Gravimetric preparation</li> </ul>	2 mg/kg to 50 mg/kg	1.7 % (relative)	
	PCB70/2,2,4-trimethylpentane	<ul style="list-style-type: none"> <li>Freezing point depression method</li> <li>GC-FID</li> <li>Gravimetric preparation</li> </ul>	2 mg/kg to 50 mg/kg	1.8 % (relative)	
	PCB105/2,2,4-trimethylpentane	<ul style="list-style-type: none"> <li>Freezing point depression method</li> <li>GC-FID</li> <li>Gravimetric preparation</li> </ul>	2 mg/kg to 50 mg/kg	2.4 % (relative)	
	PCB153/2,2,4-trimethylpentane	<ul style="list-style-type: none"> <li>Freezing point depression method</li> <li>GC-FID</li> <li>Gravimetric preparation</li> </ul>	2 mg/kg to 50 mg/kg	1.7 % (relative)	
	PCB170/2,2,4-trimethylpentane	<ul style="list-style-type: none"> <li>Freezing point depression method</li> <li>GC-FID</li> <li>Gravimetric preparation</li> </ul>	2 mg/kg to 50 mg/kg	2.0 % (relative)	
	PCB194/2,2,4-trimethylpentane	<ul style="list-style-type: none"> <li>Freezing point depression method</li> <li>GC-FID</li> <li>Gravimetric preparation</li> </ul>	2 mg/kg to 50 mg/kg	1.6 % (relative)	
	PCB28+PCB70+PCB105 +PCB153+PCB170+PCB194 /2,2,4 -trimethylpentane	<ul style="list-style-type: none"> <li>Freezing point depression method</li> <li>GC-FID</li> <li>Gravimetric preparation</li> </ul>	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)	
	4-hydroxy-clomifene*	<ul style="list-style-type: none"> <li>qNMR</li> <li>qNMR/HPLC-UV</li> <li>Gravimetric preparation</li> </ul>	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)	
	3 $\beta$ ,4 $\alpha$ -dihydroxy-5 $\alpha$ -androstane-17-one*	<ul style="list-style-type: none"> <li>qNMR</li> <li>qNMR/HPLC-UV</li> <li>Gravimetric preparation</li> </ul>	100 $\mu$ g/g to 170 $\mu$ g/g	1.4 % (relative)	
	sulfur in toluene (as sulfur)	<ul style="list-style-type: none"> <li>Freezing point depression method</li> <li>Subtracting method (GC-FID, GC-FPD, Coulometric Karl-Fischer titration)</li> <li>Gravimetric preparation</li> </ul>	0.5 mg/kg to 10000 mg/kg	0.02 mg/kg to 10 mg/kg	
		<ul style="list-style-type: none"> <li>Combustion-ultraviolet fluorescence method</li> </ul>	10 $\mu$ g/kg to 500 $\mu$ g/kg	5 $\mu$ g/kg to 20 $\mu$ g/kg	
CRMs for thermal properties	cyclohexane (thermal analysis with thermal analyzer such as DSC)	<ul style="list-style-type: none"> <li>Adiabatic calorimetry</li> </ul>	phase transition temperature 186 K to 280 K	0.04 K to 0.1 K	
		<ul style="list-style-type: none"> <li>Adiabatic calorimetry</li> </ul>	phase transition enthalpy 30 J g <sup>-1</sup> to 90 J g <sup>-1</sup>	0.7 J g <sup>-1</sup> to 3 J g <sup>-1</sup>	
High purity organic materials	perfluorooctanoic acid	<ul style="list-style-type: none"> <li>Titration and</li> <li>Subtracting method (LC-MS, Karl Fischer titration, TG)</li> </ul>	0.95 kg/kg to 1 kg/kg	0.006 kg/kg to 0.002 kg/kg	
	chloroalkanes*	<ul style="list-style-type: none"> <li>Subtracting method (GC-FID, HS-GC-MS, Karl Fischer titration, TG)</li> </ul>	0.98 kg/kg to 1 kg/kg	0.005 kg/kg to 0.001 kg/kg	

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

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
Environmental matrix (trace elements in sediment)	Sb	• ICP-MS • ID-ICP-MS	0.1 mg/kg to 3 mg/kg	10 % to 2 % (relative)	2019-11-01
	Cd	• ID-ICP-MS • ICP-MS • GFAAS	0.1 mg/kg to 3 mg/kg	10 % to 2 % (relative)	
	Cu	• ID-ICP-MS • ICP-MS • ICP-OES • GFAAS	5 mg/kg to 500 mg/kg	5 % to 1 % (relative)	
	Pb	• ID-ICP-MS • ICP-MS • ICP-OES • GFAAS	2 mg/kg to 250 mg/kg	5 % to 1 % (relative)	
	Ni	• ID-ICP-MS • ICP-MS • ICP-OES • GFAAS	5 mg/kg to 50 mg/kg	5 % to 2 % (relative)	
	Zn	• ID-ICP-MS • ICP-MS • ICP-OES	20 mg/kg to 1000 mg/kg	5 % to 1 % (relative)	
	As	• ICP-MS • ICP-OES • GFAAS • HR-ICP-MS	1 mg/kg to 50 mg/kg	20 % to 2 % (relative)	
	Co	• ICP-MS • ICP-OES • GFAAS	1 mg/kg to 50 mg/kg	15 % to 2 % (relative)	
	Se	• ID-ICP-MS • ICP-MS • HR-ICP-MS	0.1 mg/kg to 5 mg/kg	20 % to 1 % (relative)	
	Cr	• ID-ICP-MS • ICP-MS • ICP-OES • GFAAS	10 mg/kg to 500 mg/kg	10 % to 1 % (relative)	
	Hg	• ID-ICP-MS • ICP-MS • Heating evaporation-Gold amalgamation AAS	0.02 mg/kg to 5 mg/kg	15 % to 1 % (relative)	
	Ag	• ID-ICP-MS • ICP-MS	0.05 mg/kg to 2 mg/kg	4 % to 3 % (relative)	
	Mo	• ID-ICP-MS • ICP-MS	0.5 mg/kg to 20 mg/kg	7 % to 3 % (relative)	
	Sn	• ID-ICP-MS • ICP-MS	1 mg/kg to 50 mg/kg	5 % to 2 % (relative)	
Environmental (polychlorinated biphenyls in mineral oil)	PCB3	• ID-GC-MS	0.2 µg/kg to 10 mg/kg	50 % to 3 % (relative)	
	PCB8	• ID-GC-MS	0.2 µg/kg to 10 mg/kg	50 % to 3 % (relative)	
	PCB28	• ID-GC-MS	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	
	PCB52	• ID-GC-MS	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	
	PCB101	• ID-GC-MS	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	
	PCB118	• ID-GC-MS	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	
	PCB138	• ID-GC-MS	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	
	PCB153	• ID-GC-MS	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	
	PCB180	• ID-GC-MS	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	
	PCB194	• ID-GC-MS	0.1 µg/kg to 10 mg/kg	50 % to 3 % (relative)	
PCB206	• ID-GC-MS	0.09 µg/kg to 10 mg/kg	50 % to 3 % (relative)		

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



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

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
Fuel (components in biodiesel fuel)	water	• Coulometric titration • Volumetric titration	300 mg/kg to 1000 mg/kg	10 % to 5 % (relative)	2019-11-01
	Na	• ICP-MS/MS • HR-ICP-MS • FAAS	0.5 mg/kg to 20 mg/kg	20 % to 5 % (relative)	
	Mg	• ID-ICP-MS/MS • ICP-MS/MS	0.5 mg/kg to 20 mg/kg	20 % to 5 % (relative)	
	K	• ID-ICP-MS/MS • ICP-MS/MS	0.5 mg/kg to 20 mg/kg	20 % to 5 % (relative)	
	Ca	• ID-ICP-MS/MS • ICP-MS/MS	0.5 mg/kg to 20 mg/kg	20 % to 5 % (relative)	
	P	• ICP-MS/MS • FI-ICP-MS • ICP-OES	0.5 mg/kg to 20 mg/kg	20 % to 5 % (relative)	
	S	• ID-ICP-MS/MS • ICP-MS/MS • Combustion-IC	2 mg/kg to 50 mg/kg	10 % to 5 % (relative)	
Environmental matrix (river water and drinking water)	Al	• ICP-MS • ICP-MS/MS • GFAAS	1 µg/kg to 100 µg/kg	8 % to 1 % (relative)	
	Sb	• ID-ICP-MS • ICP-MS • HR-ICP-MS • ICP-MS/MS	0.001 µg/kg to 10 µg/kg	5 % to 1 % (relative)	
	As	• ICP-MS • ICP-MS/MS • GFAAS	0.05 µg/kg to 50 µg/kg	15 % to 1 % (relative)	
	Ba	• ID-ICP-MS • ICP-MS • ICP-MS/MS	0.5 µg/kg to 50 µg/kg	2 % to 1 % (relative)	
	B	• ID-ICP-MS • ICP-MS • ICP-MS/MS	1 µg/kg to 100 µg/kg	5 % to 1 % (relative)	
	Cd	• ID-ICP-MS • ICP-MS • ICP-MS/MS	0.001 µg/kg to 10 µg/kg	15 % to 2 % (relative)	
	Cr	• ID-ICP-MS • ICP-MS • ICP-MS/MS	0.05 µg/kg to 50 µg/kg	8 % to 1 % (relative)	
	Cu	• ID-ICP-MS • ICP-MS • ICP-MS/MS	0.05 µg/kg to 50 µg/kg	15 % to 1 % (relative)	
	Fe	• ID-ICP-MS • ICP-MS • ICP-MS/MS	0.1 µg/kg to 100 µg/kg	10 % to 1 % (relative)	
	Pb	• ID-ICP-MS • ICP-MS • ICP-MS/MS	0.001 µg/kg to 10 µg/kg	15 % to 1 % (relative)	
	Mn	• ICP-MS • ICP-MS/MS • GFAAS	0.01 µg/kg to 50 µg/kg	15 % to 1 % (relative)	
	Mo	• ID-ICP-MS • ICP-MS • HR-ICP-MS • ICP-MS/MS	0.05 µg/kg to 10 µg/kg	2 % to 1 % (relative)	
	Ni	• ID-ICP-MS • ICP-MS • ICP-MS/MS	0.01 µg/kg to 50 µg/kg	5 % to 1 % (relative)	
	Se	• ID-ICP-MS • ICP-MS • ICP-MS/MS	0.1 µg/kg to 50 µg/kg	10 % to 1 % (relative)	
	Zn	• ID-ICP-MS • ICP-MS • ICP-MS/MS	0.05 µg/kg to 50 µg/kg	10 % to 1 % (relative)	
	Na	• ICP-MS • ICP-OES • MP-AES	1 mg/kg to 50 mg/kg	5 % to 1 % (relative)	
	K	• ICP-MS • ICP-OES • MP-AES	0.2 mg/kg to 50 mg/kg	5 % to 1 % (relative)	
	Mg	• ICP-MS • ICP-OES • MP-AES	0.2 mg/kg to 50 mg/kg	5 % to 1 % (relative)	
	Ca	• ICP-MS • ICP-OES • MP-AES	1 mg/kg to 50 mg/kg	5 % to 1 % (relative)	
	Rb	• ID-ICP-MS • ICP-MS • ICP-MS/MS	0.05 µg/kg to 100 µg/kg	5 % to 1 % (relative)	
Sr	• ID-ICP-MS • ICP-MS • ICP-MS/MS	0.05 µg/kg to 200 µg/kg	5 % to 1 % (relative)		
P	• ICP-MS	1 µg/kg to 100 µg/kg	5 % to 1 % (relative)		

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
Environmental matrix* (sea water)	Cr	• ID-ICP-MS • ICP-MS	1 µg/kg to 20000 µg/kg	10 % to 2 % (relative)	2019-11-01 *2021-09-29
	Mn	• ICP-MS • GFAAS	1 µg/kg to 20000 µg/kg	10 % to 2 % (relative)	
	Fe	• ID-ICP-MS • ICP-MS	1 µg/kg to 20000 µg/kg	10 % to 2 % (relative)	
	Ni	• ID-ICP-MS • ICP-MS	1 µg/kg to 20000 µg/kg	15 % to 2 % (relative)	
	Cu	• ID-ICP-MS • ICP-MS	1 µg/kg to 20000 µg/kg	10 % to 2 % (relative)	
	Zn	• ID-ICP-MS • ICP-MS	1 µg/kg to 20000 µg/kg	20 % to 2 % (relative)	
	As	• ICP-MS • GFAAS	1 µg/kg to 20000 µg/kg	15 % to 2 % (relative)	
	Se	• ID-ICP-MS • ICP-MS	1 µg/kg to 20000 µg/kg	15 % to 2 % (relative)	
	Cd	• ID-ICP-MS • ICP-MS	0.3 µg/kg to 20000 µg/kg	10 % to 2 % (relative)	
	Pb	• ID-ICP-MS • ICP-MS	1 µg/kg to 20000 µg/kg	10 % to 2 % (relative)	
	dissolved silica	• Colorimetry • IC • IC-ID-ICP-MS	0.03 mg/kg to 5 mg/kg	12 % to 1 % (relative)	
	nitrate ion	• Colorimetry • IC	0.8 mg/kg to 3 mg/kg	3 % to 1 % (relative)	
	nitrite ion	• Colorimetry • IC	0.01 mg/kg to 0.3 mg/kg	20 % to 5 % (relative)	
phosphate ion	• Colorimetry	0.1 mg/kg to 0.3 mg/kg	5 % to 1 % (relative)		
Standard solution for chemical speciation	arsenobetaine	• HPLC-ICP-MS • ICP-MS • ICP-OES • GFAAS	1 mg/kg to 1000 mg/kg	5 % to 1 % (relative)	
	arsenate(As(V))	• HPLC-ICP-MS • ICP-MS • ICP-OES • GFAAS	1 mg/kg to 1000 mg/kg	5 % to 1 % (relative)	
	dimethylarsenic acid	• HPLC-ICP-MS • ICP-MS • ICP-OES • GFAAS	1 mg/kg to 1000 mg/kg	5 % to 1 % (relative)	

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

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
Food (trace elements, arsenobetaine and methylmercury in fish, shellfish, and cephalopoda tissues)	Se	• ID-ICP-MS • ICP-MS • GFAAS	0.1 mg/kg to 10 mg/kg	15 % to 3 % (relative)	2019-11-01
	Hg	• ID-ICP-MS • ICP-MS • Heating evaporation Gold amalgamation AAS	0.1 mg/kg to 10 mg/kg	10 % to 1 % (relative)	
	Na	• ICP-OES • FAAS • Flame photometry	1 mg/kg to 100 g/kg	10 % to 2 % (relative)	
	Mg	• ICP-MS • ICP-OES • FAAS	0.5 mg/kg to 100 g/kg	5 % to 1 % (relative)	
	K	• ICP-OES • FAAS • Flame photometry	1 mg/kg to 100 g/kg	10 % to 2 % (relative)	
	Ca	• ICP-MS • ICP-OES • FAAS • Flame photometry	0.1 mg/kg to 100 g/kg	15 % to 3 % (relative)	
	arsenobetaine	• HPLC-ICP-MS • ID-LC-MS	1 mg/kg to 100 mg/kg (as As)	10 % to 2 % (relative)	
	methylmercury	• ID-GC-ICP-MS	0.1 mg/kg to 10 mg/kg (as Hg)	5 % to 1 % (relative)	
	Sr	• ID-ICP-MS • ICP-MS • ICP-OES • GFAAS	0.02 mg/kg to 10 mg/kg	10 % to 1.2 % (relative)	
	Cd	• ID-ICP-MS • ID-HR-ICP-MS • ICP-MS • ICP-OES • GFAAS	0.01 mg/kg to 5 mg/kg	10 % to 1.5 % (relative)	
	P	• ICP-MS • HR-ICP-MS • ICP-OES	1 g/kg to 100 g/kg	5 % to 2 % (relative)	
Food (trace elements and arsenic compounds in algae)	Na	• ICP-OES • FAAS • Flame photometry	0.5 g/kg to 100 g/kg	10 % to 1 % (relative)	
	K	• ICP-OES • FAAS • Flame photometry	1 g/kg to 100 g/kg	10 % to 1 % (relative)	
	Mg	• ICP-MS • ICP-OES • FAAS	0.1 g/kg to 100 g/kg	10 % to 1 % (relative)	
	Ca	• ICP-MS • ICP-OES • FAAS • Flame photometry	0.5 g/kg to 100 g/kg	10 % to 1 % (relative)	
	Sr	• ICP-MS • ID-ICP-MS • ICP-OES • GFAAS	0.1 g/kg to 50 g/kg	10 % to 1 % (relative)	
	P	• ICP-MS • HR-ICP-MS • ICP-OES	0.01 g/kg to 50 g/kg	10 % to 1 % (relative)	
	Al	• ICP-MS • ICP-OES • GFAAS	10 mg/kg to 1000 mg/kg	10 % to 3 % (relative)	
	As	• ICP-MS • HR-ICP-MS • ICP-OES • GFAAS	0.5 mg/kg to 100 mg/kg	10 % to 2 % (relative)	
	Ba	• ICP-MS • ID-ICP-MS	0.5 mg/kg to 100 mg/kg	10 % to 1 % (relative)	
	Cd	• ICP-MS • ID-ICP-MS • ICP-OES • GFAAS	0.01 mg/kg to 10 mg/kg	10 % to 2 % (relative)	
	Co	• ICP-MS • HR-ICP-MS • ICP-OES • GFAAS	0.1 mg/kg to 10 mg/kg	10 % to 3 % (relative)	
	Cr	• ID-ICP-MS • HR-ICP-MS • ICP-OES	0.1 mg/kg to 50 mg/kg	15 % to 2 % (relative)	
	Cu	• ICP-MS • ID-ICP-MS • ICP-OES • GFAAS	0.1 mg/kg to 50 mg/kg	10 % to 2 % (relative)	
	Fe	• ICP-MS • ID-ICP-MS • ICP-OES • GFAAS	10 mg/kg to 1000 mg/kg	10 % to 2 % (relative)	
	Mn	• ICP-MS • HR-ICP-MS • ICP-OES • GFAAS	0.1 mg/kg to 50 mg/kg	10 % to 2 % (relative)	
	Ni	• ICP-MS • ID-ICP-MS • ICP-OES	0.1 mg/kg to 10 mg/kg	15 % to 2 % (relative)	
	Pb	• ICP-MS • ID-ICP-MS • ICP-OES	0.01 mg/kg to 10 mg/kg	15 % to 2 % (relative)	
Zn	• ICP-MS • ID-ICP-MS • ICP-OES • GFAAS	0.1 mg/kg to 100 mg/kg	10 % to 2 % (relative)		

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

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

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



Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
Molecular weight of polymer	poly (ethylene glycol) nonylphenyl ether (mass-average molecular mass, number-average molecular mass)	• SFC	600 to 700	3 % (relative)	
	poly (ethylene glycol) nonylphenyl ether (mass fraction and mole fraction of each degree of polymerization)	• SFC	$1 \times 10^{-4}$ to 1	5 % (relative)	
	polystyrene (mass-average molecular mass, number-average molecular mass, peak-average molecular mass)	• SFC	400 to 2600	0.5 % (relative)	
	polystyrene (polydispersity)	• SFC	1.05 to 1.20	1.5 % (relative)	
	polystyrene (mass fraction and mole fraction of each degree of polymerization)	• SFC	$2 \times 10^{-5}$ to 1	2 % (relative)	
	poly (ethylene glycol) (mass-average molecular mass, number-average molecular mass)	• SFC	350 to 1700	1 % (relative)	
	poly (ethylene glycol) (mass fraction and mole fraction of each degree of polymerization)	• SFC	$3 \times 10^{-5}$ to 1	1 % (relative)	
	monodisperse polystyrene (mass-average molar mass)	• Static light scattering (SLS)	$1 \times 10^5$ to $1 \times 10^6$	5 % (relative)	
poly (ethylene glycol) 23mer (mass fraction)	• SFC	0.99 to 1	0.1 % (relative)		
Particle reference material	polystyrene latex nanoparticle (light scattering intensity averaged diameter)	• Dynamic light scattering (DLS)	100 nm to 300 nm	1 % (relative)	
Polymer reference material (polymer: organic compounds)	polybrominated diphenyl ether in plastics (polystyrene, polyvinyl chloride)	• ID-GC-MS • HPLC	50 mg/kg to 1500 mg/kg	5 % to 2 % (relative)	
	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 (polystylen, polypropylene, polyvinyl chloride)	• ID-GC-MS • HPLC	50 mg/kg to 1500 mg/kg	3 % to 1.5 % (relative)	
Polymer reference material (Raman shift) *	Raman shift	• Raman spectroscopy	$300 \text{ cm}^{-1} \sim 3500 \text{ cm}^{-1}$	$0.28 \text{ cm}^{-1}$	
Polymer (perfluoroalkyl substances in polymer)	perfluorooctanesulfonic acid and its salts	• ID-LC-MS/MS	10 mg/kg to 100 mg/kg	20 % to 10 % (relative)	
Positron lifetime	positron lifetime in solids	• Positron annihilation lifetime spectroscopy	0.1 ns to 20 ns	2 % (relative)	
Steel	chromium	• Titration • EPMA	mass fraction 20 % to 40 %	0.1 % (relative)	
	nickel	• Titration • EPMA	mass fraction 15 % to 70 %	0.1 % (relative)	
	iron	• Titration • EPMA	mass fraction 5 % to 70 %	0.1 % (relative)	
	carbon	• Gravimetric analysis • EPMA	mass fraction 0.05 % to 1.0 %	10.0 % to 1.0 % (relative)	

2019-11-01  
\*2021-09-29

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods * <sup>1</sup>	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
Thin film	film thickness	• X-ray reflectivity	each layer 1 nm to 200 nm (total film thickness 3 nm to 200 nm or less)	0.27 % to 0.06 % (relative)	2019-11-01 *2023-12-26
	arsenic	• Instrumental Neutron Activation Analysis • ICP-MS	0.01 g/kg to 1.6 g/kg	2.4 % (relative)	
Image sharpness evaluation*	dot pitch	• SEM	70 nm to 6000 nm	1.2 % (relative)	
Thick film	film thickness	• SEM	70 nm to 6000 nm	1.2 % (relative)	

Subcategory	Calibration and Measurement Capabilities				Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurand Level or Range	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
Thermophysical reference materials	Thermal expansion	· Laser interferometric thermal expansion measurement method	$-0.5 \times 10^{-6} \text{ K}^{-1}$ to $20 \times 10^{-6} \text{ K}^{-1}$ (Temperature range: 15 K to 1100 K)	$0.005 \times 10^{-6} \text{ K}^{-1}$	2023-12-26
	Thermal diffusivity	· Laser flash method	$5 \times 10^{-7} \text{ m}^2 \text{ s}^{-1}$ to $2 \times 10^{-4} \text{ m}^2 \text{ s}^{-1}$ (Temperature range: 300 K to 1500 K)	3 % (relative)	
	Specific heat capacity	· Adiabatic calorimetry · Differential Scanning calorimetry	$0.07 \text{ J K}^{-1} \text{ g}^{-1}$ to $1.8 \text{ J K}^{-1} \text{ g}^{-1}$ (Temperature range: 50 K to 900 K)	1 % (relative)	
	Thermal conductivity	The product of thermal diffusivity, specific heat capacity and density (Thermal diffusivity: · laser flash method · pulse heating thermorefectance method Specific heat capacity : · Adiabatic calorimetry · Differential Scanning calorimetry Density: dimensions and weight)	$1 \text{ W}/(\text{m} \cdot \text{K})$ to $200 \text{ W}/(\text{m} \cdot \text{K})$ (Temperature range : 300 K to 900 K)	5 % (relative)	
	Thermal diffusivity	· Pulse heating thermorefectance method	$3 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$ to $4 \times 10^{-5} \text{ m}^2 \text{ s}^{-1}$ (Measurement environment temperature : 5 °C to 35 °C)	6 % (relative)	

Subcategory	Calibration and Measurement Capabilities					Date of Accreditation
	Instrument or Artefact	Calibration Methods *1	Measurand Level or Range	Measurement Conditions / Independent Variable (Optional)	Expanded Uncertainty (Level of Confidence Approximately 95 %)	
High-purity organic reference materials	Purity determination by nuclear magnetic resonance spectroscopy and freezing-point depression method	•qNMR •Freezing-point depression method	0.980 kg/kg to 1.000 kg/kg		0.002 kg/kg	2019-11-1
	Purity determination by nuclear magnetic resonance spectroscopy (including purity verification by gas chromatography)	•qNMR	0.900 kg/kg to 1.000 kg/kg		0.002 kg/kg	
	Purity determination by nuclear magnetic resonance spectroscopy (including purity verification by high-performance liquid chromatography)	•qNMR	0.900 kg/kg to 1.000 kg/kg		0.002 kg/kg	
	Purity determination by freezing-point depression method (including purity verification by gas chromatography)	•Freezing-point depression method	0.980 kg/kg to 1.000 kg/kg		0.002 kg/kg	
	Purity determination by freezing-point depression method (including purity verification by high-performance liquid chromatography)	•Freezing-point depression method	0.980 kg/kg to 1.000 kg/kg		0.002 kg/kg	
	Purity determination by nuclear magnetic resonance spectroscopy and titrimetry	•qNMR •Titrimetry	0.600 kg/kg to 1.000 kg/kg	Total content of organic compounds except analyte shall be 0.1 kg/kg or less	0.002 kg/kg	

\*1

CRDS :	Cavity ring down spectroscopy
EPMA :	Electron probe microanalysis
DLS :	Dynamic light scattering
FAAS :	Flame atomic absorption spectrometry
FAES :	Flame atomic emission spectrometry
FI-ICP-MS :	Flow injection-inductively coupled plasma mass spectrometry
FT-IR :	Fourier transform infrared spectrometry
GC :	Gas chromatography
GC-ECD :	Gas chromatography/Electron capture detector
GC-FID :	Gas chromatography/Flame Ionization detector
GC-FPD :	Gas chromatography/Flame photometric detector
GC-MS :	Gas chromatography/Mass spectrometry
GC-PID :	Gas chromatography/Photo ionization detector
GC-SCD :	Gas chromatography/Sulfur chemiluminescence detector
GC-TCD :	Gas chromatography/Thermal conductivity detector
GFAAS :	Graphite furnace atomic absorption spectrometry
HPLC :	High performance liquid chromatography
HPLC-CAD	High performance liquid chromatography/Charged aerosol detector
HPLC-ICP-MS :	High performance liquid chromatography/inductively coupled plasma mass spectrometry
HPLC-UV	High performance liquid chromatography/Ultraviolet-visible absorption detector
HS- :	Head space-
HR-ICP-MS :	High-resolution inductively coupled plasma mass spectrometry
IC :	Ion chromatography
ICP-MS :	Inductively coupled plasma mass spectrometry
ICP-MS/MS :	Inductively coupled plasma tandem mass spectrometry
ICP-OES :	Inductively coupled plasma optical emission spectrometry
ID-GC-MS :	Isotope dilution-gas chromatography/mass spectrometry
ID-GC-ICP-MS :	Isotope dilution-gas chromatography/Inductively coupled plasma mass spectrometry
ID-HR-ICP-MS :	Isotope dilution-high-resolution inductively coupled plasma mass spectrometry
ID-HPLC-ICP-MS :	Isotope dilution-liquid chromatography/Inductively coupled plasma mass spectrometry
ID-ICP-MS :	Isotope dilution-inductively coupled plasma mass spectrometry
ID-ICP-MS/MS :	Isotope dilution-inductively coupled plasma tandem mass spectrometry
ID-LC-MS :	Isotope dilution-liquid chromatography/mass spectrometry
ID-LC-MS/MS :	Isotope dilution-liquid chromatography/tandem mass spectrometry
LC-MS :	Liquid chromatography/mass spectrometry
MC-ICP-MS :	Multicollector inductively coupled plasma mass spectrometry
MP-AES :	Microwave plasma atomic emission spectrometry
qNMR :	Quantitative nuclear magnetic resonance spectroscopy
SEM :	Scanning electron microscopy
SFC :	Supercritical fluid chromatography
SLS :	Static light scattering
TG :	Thermogravimetry

(End of Attachment)