

# Deutsche Akkreditierungsstelle

## Annex to the Accreditation Certificate D-K-15185-01-00 according to DIN EN ISO/IEC 17025:2018

**Valid from:** 07.02.2023

**Date of issue:** 07.02.2023

Holder of accreditation certificate:

**Merck KGaA**  
**Kalibrierlaboratorium für chemische Messgrößen**  
**Frankfurter Straße 250, 64293 Darmstadt**

The calibration laboratory meets the minimal requirements of DIN EN ISO/IEC 17025:2018 and, if applicable, additional legal and normative requirements, including those in relevant sectoral schemes, in order to carry out the conformity assessment activities listed below.

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of calibration laboratories and confirm generally with the principles of DIN EN ISO 9001.

Calibration in the fields:

### **Chemical and medical quantities**

#### **Chemical analysis and reference materials**

- **pH value**
- **Electrolytic conductivity**
- **Mass fraction of elements in standard solutions**
- **Mass concentration of elements in standard solutions**
- **Mass fraction of elements in multi standard solutions**
- **Mass concentration of elements in multi standard solutions**
- **Mass fraction of titrimetric standards**
- **Mass fraction of water in water standards and titrimetric standards**
- **Amount-of-substance concentration in volumetric solutions**
- **Mass fraction in ion chromatography standard solutions**
- **Mass concentration in ion chromatography standard solutions**

*This certificate annex is only valid together with the written accreditation certificate and reflects the status as indicated by the date of issue. The current status of any given scope of accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH at <https://www.dakks.de>.*

**Annex to the Accreditation Certificate D-K-15185-01-00**

**Permanentes Laboratory**

**Calibration and Measurement Capabilities (CMC)**

Measured quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
pH value pH reference substances	1 to 11	differential potentiometry Inhouse procedure according SOP 20120940, Version 3/2020	0.003	Specified are the absolute measurement uncertainties. These depend on the deployed primary reference material.
pH value pH reference buffer solutions	1 to 11	differential potentiometry Inhouse procedure according SOP 20120940, Version 3/2020	0.003	
pH value pH buffer solutions	0 to < 10	multipoint calibration by means of glass electrode Inhouse procedure according SOP 20404229, Version 2/2020	0.01	
pH value pH buffer solutions	10 to 14	multipoint calibration by means of glass electrode Inhouse procedure according SOP 20404229, Version 2/2020	0.02	
Electrolytic conductivity Reference material	0.5 $\mu\text{S cm}^{-1}$ to < 15 $\mu\text{S cm}^{-1}$	conductivity measuring Inhouse procedure according SOP 20120941, Version 5/2020	25 %	Specified are the relative measurement uncertainties. These depend on the deployed primary reference material.
	15 $\mu\text{S cm}^{-1}$ to < 1000 $\mu\text{S cm}^{-1}$		0.4 %	
	0.1 $\text{Sm}^{-1}$ to 12 $\text{Sm}^{-1}$		0.24 %	
Mass fraction of titrimetric standards	$\geq 95.00 \%$	Titrimetry Inhouse procedure according SOP 20404230, Version 2/2020		Specified are the absolute measurement uncertainties. These depend on the deployed primary reference material.
Tris(hydroxymethyl)-aminomethane			0.04 %	
Sodium carbonate			0.05 %	
Potassium hydrogen phthalate			0.02 %	
Benzoic acid			0.05 %	
Sodium chloride			0.02 %	
Zinc			0.02 %	
Calcium carbonate			0.03 %	
Potassium dichromate			0.04 %	
Disodium oxalate			0.05 %	
Iron(II)ethylene diammonium sulfate			0.05 %	
Potassium iodate	0.02 %			

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Measured quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Amount-of-substance concentration in volumetric solutions	0.003 mol/L to 10 mol/L	Titrimetric Inhouse procedure according SOP 20404235, Version 2/2020  Measurement method via metrological traceability to primary standards  Measurement method via metrological traceability to primary solutions  Measurement method via metrological traceability to volumetric solutions	0.1 % to 0.3 %	Specified are the relative measurement uncertainties. These depend on the deployed primary reference material.
Mass fraction of ion chromatography standard solutions	900 mg/kg to 1100 mg/kg	Titrimetric Inhouse procedure according SOP 20689669, Version 1/2022	0.1 % to 0.5 %	Specified are the relative measurement uncertainties. These depend on the deployed primary reference material.
Mass concentration of ion chromatography standard solutions	900 mg/L to 1100 mg/L	Measurement method via metrological traceability to volumetric solutions	0.1 % to 0.5 %	
Mass fraction of water in water standards and titrimetric standards	15 mg/kg to < 0.1 g/kg	KF coulometry direct measurement KF oven technology  Inhouse procedure according SOP 20404233, Version 2/2020	0.95 mg/kg to 3.2 mg/kg	Specified are the absolute measurement uncertainties.
	0.1 g/kg to < 1.0 g/kg		3.2 mg/kg to 6.3 mg/kg	
	1,0 g/kg to < 10 g/kg		6.3 mg/kg to 33 mg/kg	
	10 g/kg to 52 g/kg	33 mg/kg to 0,25 g/kg		
	1.0 g/kg to 160 g/kg	KF volumetry Inhouse procedure according SOP 20404233, Version 2/2020	12 mg/kg to 2.0 g/kg	
	5 % to 16 %	Loss on drying (temperature: 150°C)  Inhouse procedure according SOP 20404233, Version 2/2020	0.01 % to 0.05 %	
Mass fraction of elements in standard solutions	9 mg/kg to 10500 mg/kg	inductively coupled plasma optical emission spectrometry ICP-OES	0.3 % to 0.8 %	Specified are the relative measurement uncertainties. These depend on the deployed primary Reference material.
Mass fraction of elements in standard solutions	9 mg/L to 10500 mg/L	Inhouse procedure according SOP 20120939, Version 3/2020	0.3 % to 0.8 %	

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**Calibration and Measurement Capabilities (CMC)**

Measured quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Mass concentration of elements in multi standard solutions	0.9 µg/kg to 10500 µg/kg	inductively coupled plasma optical emission spectrometry ICP-OES	0.1 % to 32 %	Specified are the relative measurement uncertainties These depend on the deployed primary Reference material.
Mass concentration of elements in multi standard solutions	0.9 µg/L to 10500 µg/L	Inhouse procedure according SOP 20689681, Version 1/2022	0.1 % to 32 %	

**Abbreviations used:**

CMC            Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten)  
SOP            Standard Operating Procedure