

# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

 <p><b>UKAS</b> CALIBRATION</p> <p><b>0423</b></p> <p>Accredited to <b>ISO/IEC 17025:2017</b></p>	<p><b>LGC Limited</b></p> <p><b>Issue No: 038 Issue date: 25 March 2024</b></p>	
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<p><b>Calibration performed at the above address only</b></p>		

### Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ( $k = 2$ )	Remarks
CHEMICAL			
Forensic Alcohol Standards	20 mg/100 ml solution to 600 mg/100 ml solution	0.60 mg alcohol/100 ml solution	SOP FFF/B1-1025 using chemical oxidation with excess dichromate determined by titration
Purity of Ethanol and ethanol/water mixtures	20 mg/100 ml solution to 600 mg/100 ml solution to absolute ethanol	100% relative to total organic impurities present (typically < 0.02% wt/ wt)	SOP FFF/B1-1027 using Gas Chromatography
Purity of organic materials (molecular weight up to 1000)	Purity of 90% to 100% (wt/wt)	Minimum expanded uncertainty 0.20% (wt/wt)	SOP INS/B1 041 using quantitative <sup>1</sup> H Nuclear Magnetic resonance (NMR) using a Bruker 600MHz spectrometer
Purity of organic materials (molecular weight up to 1000)	Purity of 1% to 90% (wt/wt)	Minimum expanded uncertainty 0.04 to 0.23 % (wt/wt)	SOP INS/B1 0417 using quantitative <sup>1</sup> H Nuclear Magnetic resonance (NMR) using a Bruker 600MHz spectrometer
Concentration of calibration solutions	Concentration of 0.01% to 1.0% (wt/wt)	Minimum expanded uncertainty 0.0005 to 0.03 % (wt/wt)	SOP INS/B1 0419 using quantitative <sup>1</sup> H Nuclear Magnetic resonance (NMR) using a Bruker 600MHz spectrometer
Purity of organic materials	Purity of 98.5 % to 100% (wt/wt)	0.40 % (wt/wt)	SOP INS/B1-0303 using Gas Chromatography
	Purity of 98.5 % to 100% (wt/wt)	0.40 % (wt/wt)	SOP INS/B1-0302 using High Performance Liquid Chromatography
	97 % to 100 % (wt/wt)	0.30 % (wt/wt)	SOP INS/B1-0405 using Differential Scanning Calorimetry
Volatiles and non-volatiles in organic materials	% wt/wt Water	0.12% (wt/wt)	SOP INS/B1 -0415 using Thermogravimetric Analyser (TGA)
	% wt/wt Volatile Organics	0.28% (wt/wt)	
	% wt/wt Inorganic Residue residue (heating to 800°C)	0.22% (wt/wt)	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ( $k = 2$ )	Remarks
CHEMICAL (cont'd)			
Determination of water content	0.03 mg H <sub>2</sub> O to 0.14 mg H <sub>2</sub> O 0.14 mg H <sub>2</sub> O to 11.0 mg H <sub>2</sub> O	1.22 relative 0.08 relative	SOP INS/B1-0411 using coulometric Karl-Fischer titration. Note that the technique is sample size dependent.
Peptide mass fraction	Synthetic unmodified peptide of known sequence with less than 10% peptidic impurities, containing at least three of amino acids alanine, glycine, valine, leucine, isoleucine, proline, phenylalanine, lysine, arginine	3.2 to 4.6%	SOP INS B1-0418 using microwave digestion and GC-MS
DENSITY			
Apparent density in air at 20 °C of alcohol/water mixtures	788.16 kg/m <sup>3</sup> to 997.15 kg/m <sup>3</sup>  Corresponding to 100 % to 0 % alcohol by volume	0.060 kg/m <sup>3</sup>	SOP FFF/B1-1026, Density measurements by pycnometry  Relating to density in air at 20 °C to % abv using HM Customs and Excise official laboratory alcohol table RDC 80/267/04 which is based upon the OIML value of ethanol density of 789.24 kg/m <sup>3</sup> published in support of OIML IR22, leading to an apparent density in air of pure ethanol at 20 °C of 788.16 kg/m <sup>3</sup>
END			



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**Appendix - Calibration and Measurement Capabilities**

**Introduction**

The definitive statement of the accreditation status of a calibration laboratory is the Accreditation Certificate and the associated Schedule of Accreditation. This Schedule of Accreditation is a critical document, as it defines the measurement capabilities, ranges and boundaries of the calibration activities for which the organisation holds accreditation.

**Calibration and Measurement Capabilities (CMCs)**

The capabilities provided by accredited calibration laboratories are described by the Calibration and Measurement Capability (CMC), which expresses the lowest measurement uncertainty that can be achieved during a calibration. If a particular device under calibration itself contributes significantly to the uncertainty (for example, if it has limited resolution or exhibits significant non-repeatability) then the uncertainty quoted on a calibration certificate will be increased to account for such factors.

The CMC is normally used to describe the uncertainty that appears in an accredited calibration laboratory's schedule of accreditation and is the uncertainty for which the laboratory has been accredited using the procedure that was the subject of assessment. The measurement uncertainty is calculated according to the procedures given in the GUM and is normally stated as an expanded uncertainty at a coverage probability of 95 %, which usually requires the use of a coverage factor of  $k = 2$ . An accredited laboratory is not permitted to quote an uncertainty that is smaller than the published measurement uncertainty in certificates issued under its accreditation.

**Expression of CMCs - symbols and units**

It should be noted that the percentage symbol (%) represents the number 0.01. In cases where the measurement uncertainty is stated as a percentage, this is to be interpreted as meaning percentage of the measurand. Thus, for example, a measurement uncertainty of 1.5 % means  $1.5 \times 0.01 \times q$ , where  $q$  is the quantity value.

The notation  $Q[a, b]$  stands for the root-sum-square of the terms between brackets:  $Q[a, b] = [a^2 + b^2]^{1/2}$