Certificate of measurement

4005

Aqueous Ethanol – 80 mg/100 mL

Certified Reference Material LGC5401

Certified Value

Parameter	Certified value[1,2] (mg/100 mL)	Uncertainty[3] (mg/100 mL)
Ethanol content	80.1	0.6

Notes:

1. The certified value was determined by chemical oxidation of the ethanol with excess potassium dichromate followed by titration with acidified iron (II) ammonium sulfate.
2. The certified value is traceable to the SI. See section entitled "Analytical Method Used for Certification" on page 2 of this certificate for details of reference materials used.
3. The quoted uncertainty is the half-width of the expanded uncertainty interval calculated using a coverage factor of $k = 2$, which gives a level of confidence of approximately 95 %. The expanded uncertainty is based on the combination of uncertainties associated with each individual operation involved in the preparation and characterisation of the reference material.

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Latest certificate revision June 2022

Signed:_____
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Material Preparation

The purity of a suitable supply of ethanol was determined following estimation of organic impurities by gas chromatography and the water content by Karl Fischer titration. The ethanol was then diluted gravimetrically with ultrapure water to produce a solution with a nominal ethanol concentration of 80 mg/100 mL. Mercury (II) chloride (nominal 0.1 g/L) was added as a preservative. The solution was thoroughly mixed and sub-sampled as 25 mL portions into amber glass bottles fitted with tamper-evident screw caps.

Homogeneity

The material was tested for homogeneity by analysing randomly selected samples using dichromate titration (see below). The material was judged to be homogenous as the variation between the samples tested was not significantly greater than the method variation. The level of homogeneity proved satisfactory for a sample volume of 20 mL.

Analytical Method Used

The ethanol content was determined by chemical oxidation of the ethanol with excess potassium dichromate (NIST SRM 136f) followed by titration with acidified iron (II) sulfate. Characterisation involved the determination of the ethanol concentration of 16 samples selected at random from across the fill run. The certified value is the overall mean of the 16 results obtained. The uncertainty incorporates contributions from the characterisation uncertainty, and from any possible inhomogeneity.

Stability

Deterioration is not anticipated over the lifetime of the material when stored under the recommended conditions; however LGC5401 will be subjected to testing under the LGC stability monitoring programme. Purchasers will be informed of any changes affecting the certified value.

Storage Conditions

The material should be stored at a temperature of (5 ± 4) °C in the original, closed container.

Shelf Life

This certificate is valid for 12 months from the date of shipment provided the sample is stored under the recommended conditions.

Intended Use

This material is intended for use as a reference material for the calibration and validation of methods for the determination of ethanol in biological fluids.

Safety Information

Care should be taken as the material contains mercury (II) chloride (nominally 0.1 g/L) as a preservative. Refer to the safety data sheet for further information.

Instructions for Use

Prior to use, the solution should be allowed to equilibrate to ambient temperature (20 ± 5) °C and thoroughly mixed by inversion. Due care should be exercised when handling once the bottle has been opened, to prevent evaporation causing changes in composition. The minimum amount of sample to be used is 20 mL.

Opened units must be recapped as soon as possible after use, stored at (5 ± 4) °C, and used within one week.

Metrological Traceability

The certified value is traceable to the SI. See section entitled “Analytical Method Used” on page 2 of this certificate for details of reference materials used.

Certificate Revision

In April 2020, the Instructions for Use section was updated to give additional guidance regarding the use of opened units.

The certificate was revised in June 2022 to reflect an update to the UKAS symbol.

Unit Number	Date of Shipment

Legal Notice

The values quoted in this certificate are the best estimate of the true values within the stated uncertainties and based on the techniques described herein. No warranty or representation, express or implied, is made that the use of the product or any information, material, apparatus, method or process which is the subject of or referred to in this certificate does not infringe any third party rights. Further, save to the extent: (a) prohibited by law; or (b) caused by a party's negligence; no party shall be liable for the use made of the product, any information, material, apparatus, method or process which is the subject of or referred to in this document. In no event shall the liability of any party exceed whichever is the lower of: (i) the value of the product; or (ii) £500,000; and any liability for loss of profit, loss of business or revenue, loss of anticipated savings, depletion of goodwill, any third-party claims or any indirect or consequential loss or damage in connection herewith is expressly excluded.

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