



NATIONAL PHYSICAL LABORATORY

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Certificate of Calibration



4002

NPL PRIMARY REFERENCE MATERIAL

Cylinder Number: D982573

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CUSTOMER: Goethe Universität Frankfurt
ADDRESS: Institut für Atmosphäre und Umwelt, Altenhöferallee 1, 60438 Frankfurt am Main, Germany
CALIBRATION DATE: 25 February 2022
AMOUNT FRACTIONS:

Component	Amount fraction / (nmol/mol)	Component	Amount fraction / (nmol/mol)
Ethane	1.03 ± 0.04	2-methylpentane	1.05 ± 0.03
Ethene	1.00 ± 0.02	<i>n</i> -hexane	1.05 ± 0.03
Propane	1.00 ± 0.03	Isoprene	1.05 ± 0.03
Propene	1.00 ± 0.02	<i>n</i> -heptane	1.06 ± 0.03
2-methylpropane	1.02 ± 0.03	Benzene	1.02 ± 0.03
<i>n</i> -butane	1.01 ± 0.03	2,2,4-trimethylpentane	0.99 ± 0.02
Ethyne	1.08 ± 0.06	<i>n</i> -octane	0.99 ± 0.02
<i>trans</i> -but-2-ene	1.02 ± 0.03	Toluene	0.99 ± 0.03
But-1-ene	1.01 ± 0.03	Ethylbenzene	1.07 ± 0.03
<i>cis</i> -but-2-ene	1.01 ± 0.03	<i>m</i> -xylene + <i>p</i> -xylene	2.08 ± 0.06
2-methylbutane	1.00 ± 0.03	<i>o</i> -xylene	1.02 ± 0.03
<i>n</i> -pentane	1.01 ± 0.03	1,3,5-trimethylbenzene	1.01 ± 0.03
1,3-butadiene	1.03 ± 0.03	1,2,4-trimethylbenzene	1.04 ± 0.03
<i>trans</i> -pent-2-ene	1.01 ± 0.03	1,2,3-trimethylbenzene	1.01 ± 0.03
Pent-1-ene	1.03 ± 0.03	Nitrogen	Balance

The reported expanded uncertainties are based on standard uncertainties multiplied by a coverage factor $k = 2$, providing a coverage probability of approximately 95 %. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

METHODS: Preparation: gravimetry; Analysis: gas chromatography (FID)
TRACEABILITY: The values on this certificate are traceable to NPL Primary Standards
EXPIRY: Certificate valid for 2 years from the date of issue
PRESSURE: Fill pressure: 107 bar; Minimum utilisation pressure: 10 bar
STORAGE: No special precautions are required
HANDLING: Refer to ISO 16664
OUTLET: DIN 477 No. 1 valve
INTENDED USE: Calibration standard

Reference: 2021070305

Date of issue: 02 March 2022

Signed:

(Authorised Signatory)

Name:

Dr D R Worton

(on behalf of NPLML)

Checked by:

Page 1 of 1