

### Certified Reference Material

This certificate is designed in accordance with ISO 17034 and ISO Guide 31. This certified reference material (CRM) was designed, produced and verified in accordance with ISO/IEC 17025, ISO 17034 and a registered quality management system ISO 9001.

#### Product Name

D5191 Vapor Pressure - 68.3kPa (9.91 psi)

#### Product Code

DRE-GS09010494

#### Lot Number

2-H393345NA

#### CAS No.

287-92-3

#### Format

Solution

#### Mol. Weight

70.14

#### Expiry

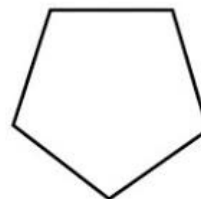
10 Nov 2021

#### Mol. Formula

C<sub>5</sub>H<sub>10</sub>

#### Storage

Ambient (15-25 °C)



**CERTIFIED**  
Concentration  
99.8 Wt %

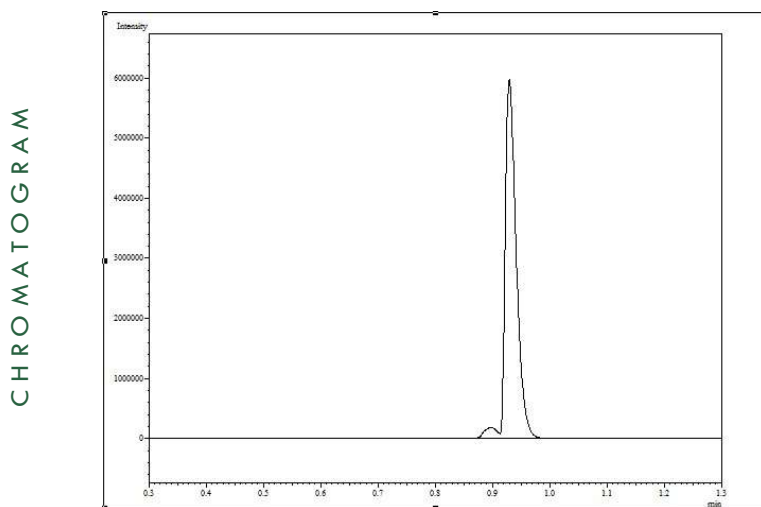
**CERTIFIED**  
Expanded Uncertainty (U)  
.45 Wt %

#### Uncertainty

The certified value(s) and uncertainty(ies) are determined in accordance with ISO 17034 with an 95% confidence level (k=2). Uncertainty is based on the Total Combined Uncertainty, including uncertainties of preparation, purity of neat materials, homogeneity, long-term stability testing, and transportation stability.

The producer certifies that this reference material meets the specification stated in this certificate until the expiry date, provided it is stored unopened at the recommended temperature herein. Product warranties for this reference material are set out in the terms and conditions of purchase.

| CERTIFIED BY           | CERTIFIED ON |  | RM Release |
|------------------------|--------------|--------------------------------------------------------------------------------------|------------|
| HuiChen Stavros, Ph.D. | 11 Nov 2019  |                                                                                      |            |



Instrument  
GC/FID

Detection  
FID

Column  
Phenomenex ZB-1HT 30m x 0.25  
mm, ID 0.25  $\mu$ m

Method Details  
Rate Temp.(C) Hold time (min)  
45.0 2.0  
10.0 150.0 0.0  
25.0 345.0 2.0

Inj.-Vol  
1  $\mu$ l

Flow  
1 ml/min

**Method of Preparation**

The certified value is based on gravimetric and volumetric preparation of this CRM. This CRM has been confirmed by the appropriate analytical techniques.

**Batch Information**

Solvent: Cyclopentane, Lot no. 2386.247.1P, 250 mL

**Gravimetric Data**

| Compound Name | Lot No.       | Weight (mg) | Chemical Purity |
|---------------|---------------|-------------|-----------------|
| Cyclopentane  | 2386.247.1.1P | 250000.00   | 99.8            |

**Intended Use**

This CRM is intended for use in a laboratory as a calibration and quality control standard or in method development for analytical techniques.

**Safety**

Proper precautions should be observed while handling. See Safety Data Sheet.

**Traceability**

The balances used for gravimetric measurements are calibrated with weights traceable to the national standards (NIST). The calibration of

the balances is verified daily internally and annually by an external accredited calibration service. Chromatographic methods are traceable to the International System of Units (SI).

**Homogeneity**

Random replicate samples of the final packaged CRM have been analysed to prove homogeneity compliant with ISO 17034.

**Storage**

The CRM should be stored in the original sealed container at the indicated temperature.

**Instructions for use**

The CRM should be used shortly after opening to avoid concentration changes due to evaporation. It is recommended to use 1  $\mu$ L as the minimum sample size. If storage after opening is necessary, it should be transferred to an amber vial with minimum head space and a Teflon-lined silicon septum. If handled as recommended, use period after opening is a maximum of 2000 days for an estimated 5% drift in concentration as a result of analyte and/or solvent transpiration. Visit the support section of our website [lgcstandards.com](http://lgcstandards.com) for a series of Dr. Ehrenstorfer Tech Tip videos and frequently asked questions.

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The producer of this reference material is registered to ISO 9001:2015 under IZ391-IS4 by NSF-ISR and accredited to ISO 17025:2005 and ISO 17034:2016 by A2LA with the accreditation numbers 3031.01 and 3031.02.



ISO 17034 Accredited  
Reference Material Producer  
Cert. No. 3031.02