

# Certificate of Analysis

Dr. Ehrenstorfer



## Product Identification

14634100 (R)-(+)-Limonene

CA (R)-(+)-4-Isopropenyl-1-methyl-1-cyclohexene

IUPAC (R)-(+)-Limonene/(R)-(+)-4-Isopropenyl-1-methylcyclohexene/(+)-p-Mentha-1,8-diene

Formula C<sub>10</sub>H<sub>16</sub>

Mol.Weight 136.24

CAS No. 5989-27-5

## Reference Materials for Residue Analysis

Expiry Date 14.04.2017

Lot Number 40130

Store at 20 °C ± 4 °C

Please note: The expiry date is valid under recommended storage conditions only.

## Toxicological Data



R Code 10-20/21/22-36/37/38

S Code 16-26-36

LD50 (Rats female/male in mg/kg) N/A

## Physical Data

Phase liquid

Color colourless

Melt.Range

Vapour pressure N/A at °C

Solubility in water N/A g/l at °C

Boiling Range (lit.)

## Analytical Data

Detection: GC/FID

Column: DB-5, 30 m, ID 0.25 mm

Inj.-Vol.: 1.00 µl

Flow: 1.0 ml/min

Ret.-Time: 10.15 min.

Method Details:

Injector: 280° C

Start Temperature: 60° C for 5 min

End Temperature: 280° C for 1 min

Gradient: 15° C/min

Identity: RT

Comment Purity was confirmed by external standard method.

Water Content 0.0 %

Determined by Karl-Fischer Titration

Det. Purity 99.7 %

Tolerance/Uncertainty +/- 0.5 %

The uncertainty/tolerance of this standard is calculated in accordance with the EURACHEM/CITAC Guide - Quantifying Uncertainty in Analytical Measurement - Second Edition. The uncertainty given is the expanded combined uncertainty and represents an estimated standard deviation equal to the positive square root of the total variance of the uncertainty of components. The expanded uncertainty is U which is  $U_c(y) \cdot K$ , where K is the coverage factor at the 95% confidence level (K=2). The expanded uncertainty is based on the combination of uncertainties associated with each individual operation involved in the preparation of this product.

Certified on 14.04.2014

by Dipl. chem. S. Fischer

The Laboratory Labor Dr. Ehrenstorfer-Schäfers is accredited by DAkkS as indicated by the Accreditation Number D-RM-14174-01 has shown competence based on ISO Guide 34:2009 with relevant parts of DIN EN ISO/IEC 17025:2005 for production of certified reference materials in form of organic pure substances and in form of single and multi-component solutions organic pure substances.

Labor Dr. Ehrenstorfer-Schäfers · Bgm.-Schlosser-Str. 6 A · 86199 Augsburg · Germany

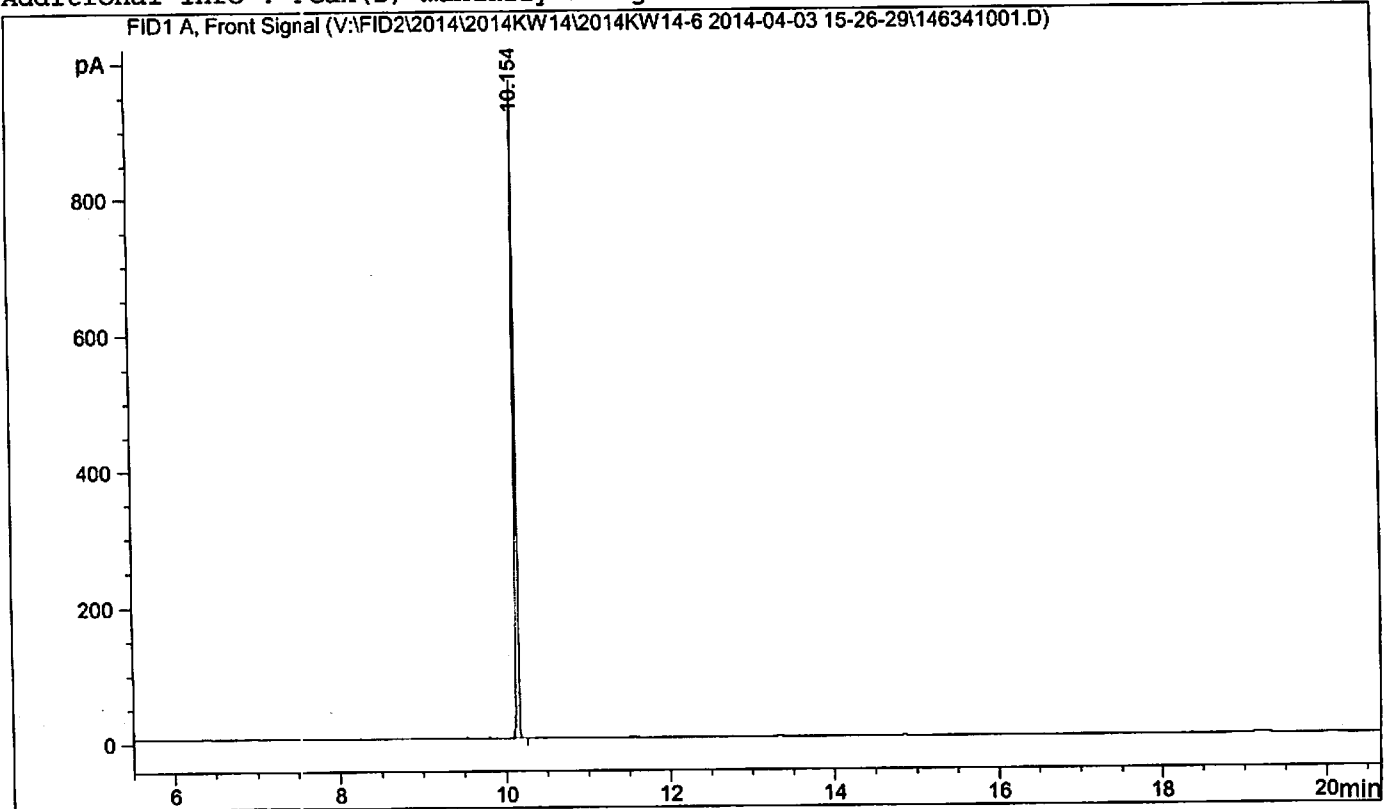
Phone +49 821 906080 · Fax +49 821 9060888 · info@analytical-standards.com

The warranty for this product is limited to the purchasing price of this product.

04.04.2014  
T926P

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=====  
Acq. Operator   : Dr. Heidrich              Seq. Line :    1  
Acq. Instrument : GCFID2                   Location  : Vial 81  
Injection Date  : 03.04.2014 15:32:08      Inj       :    1  
                                             Inj Volume: 1.000 µl  
Acq. Method     : C:\CHEM32\1\DATA\2014KW14\2014KW14-6 2014-04-03 15-26-29\PESK.M  
Last changed    : 28.11.2012 09:59:49 by Dr. Heidrich  
Analysis Method : V:\FID2\METHODS\PESK.M  
Last changed    : 28.11.2012 09:59:49 by Dr. Heidrich  
Method Info     : pesk  
  
Sample Info     : (R)-(+) -Limonene
```

Additional Info : Peak(s) manually integrated



=====  
Area Percent Report  
=====

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Sorted By      :      Signal  
Multiplier:    :      1.0000  
Dilution:      :      1.0000  
Do not use Multiplier & Dilution Factor with ISTDs
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Signal 1: FID1 A, Front Signal

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	10.154	BB	0.0237	1453.44080	958.85620	100.0000

Totals :                             1453.44080   958.85620

*SV*