



# SHIMADZU

Rev 0

## Certificate of Analysis

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Catalog No.	Lot No.	Storage	Solvent	Date Received	Exp. Date
220-94697-01	324983	≤ -10 °C	Isooctane	_____	20-Nov-2019

**Description:**

Octafluoronaphthalene Solution, 1 ug/L, 1 mL  
With Sample Vial

**Container:**

1 ml Ampule, Amber Glass

### Certified Values:

The certified value is based on gravimetric and volumetric preparation of this Certified Reference Material (CRM). This CRM has been confirmed by GC/MS, GC, HPLC, UPLC/HRAM-MS, UV/VIS, Enzymatic, and/or wet chemistry techniques using internally developed method(s) against independent source(s). The uncertainty value is calculated for a 95% confidence interval with a *k* value of 2. The purity of neat materials not traceable to an ISO Guide 34:2009 accredited Reference Material Provider is traceable to internal analysis by GC, GC/MS, HPLC, Enzymatic, or wet chemistry techniques and compared to a National Metrological Institute such as NIST where feasible.

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration, ug/L
octafluoronaphthalene	313-72-4	97	2734.226.1P	1.002 +/-1.8

### Intended Uses:

This CRM is intended for use as a calibration standard or a quality control standard for chromatography equipment such as GC, GC/MS, HPLC, and HPLC/MS. It may also be used for various USEPA, NIOSH and ASTM methods.

*Recommended storage container for ampuled products after opening is a 12mmx32mm amber vial with screw cap Teflon lined silicon septum. The modeled % change per day can be calculated using the following:*

$$\% \text{ Change} = 116192x^{-2.578} + 40.383e^{-0.03y}$$

*where x = boiling point of the most volatile analyte in the mix  
y = boiling point of the solvent*

*This model assumes the container is stored at -10 °C and is unopened during storage. The user should determine what the*

### Method of Preparation:

This standard was prepared gravimetrically using balances calibrated with National Institute of Standards and Technology (NIST) traceable weights (NIST Test Numbers 822/273070-06, 822/275141-07, 822/278993-10). Only calibrated Class A volumetric glassware and/or calibrated syringes were used to prepare this standard. Raw materials may have been checked

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for stoichiometry and purity prior to use. This standard has been analyzed against an independent source.

## Packaging and Storage:

The solution should be stored according to the following storage requirements:  $\leq -10^{\circ}\text{C}$

Once the product is opened, it should be transferred to a vial with minimum head space if the product was received in a sealed ampule.

## Glassware Calibration:

Only Class A glassware and/or calibrated syringes are used in the manufacture and quality control of standards. All glassware is calibrated using NIST traceable weights.

## Weights and Balance Calibration:

Weights used to perform daily checks on balances are calibrated annually by the State of South Carolina Department of Agriculture Metrology Laboratory and are traceable to NIST. Balances are checked daily in accordance to procedure O2-LB-004. Balances are calibrated annually by an ISO/IEC 17025:2005 accredited metrology service.

## Homogeneity:

Homogeneity has been established in accordance with internal procedure O2-QS-10 and has a maximum uncertainty of 0.1%. This is consistent with the intended use of this CRM. The homogeneity of this product has been confirmed by procedures consistent with ISO/IEC 17025:2005 and ISO 17034:2016. The homogeneity of this CRM is valid for sample sub-sizes that the end user can quantitatively reproduce.

## Hazardous Information:

Refer to MSDS.

## Calculation of Uncertainty:

The following equations are used to calculate the value of the expanded uncertainty:

$U = k u_c$   $U$ =Expanded Uncertainty,  $k$ = the coverage factor at the 95% confidence level,  $k=2$ ,  $u_c$  = the combined uncertainty

$u_c = (u_{\text{Char}}^2 + u_{\text{Trans}}^2 + u_{\text{Homo}}^2 + u_{\text{LTS}}^2)^{1/2}$  where  $u_i$  are the individual uncertainty components for manufacturing, transportation, homogeneity, and shelf life. While no significant uncertainty was detected in the replicates, a minimum contribution to uncertainty was added for homogeneity and long term stability as described in ISO Guide 35:2006.

## Expiration Information:

The stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. These tests include the effect of temperature and packaging on the product. Studies on the short term instability have determined no contribution to instability as observed on the concentration under controlled transportation conditions. This standard is guaranteed until 20-Nov-2019

## Quality Standard Documentation:

Manufacturer has the following accreditations:

Manufactured By:



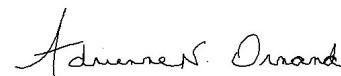
Shane Overcash  
20 -Nov-2017  
Chemist I

Certified By:



Andrea Tunnard  
21 -Nov-2017  
Chemist I

Released By:



Adrienne Ormand  
21 -Nov-2017  
Chemist I

Shimadzu Scientific Instruments, 7102 Riverwood Drive, Columbia, MD 21046

Tel: 800.477.1227/410.381.1227, Fax: 410.381.1222

www.ssi.shimadzu.com

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- ISO 9001:2008 Quality Management System Registration - NSF-ISR Certificate Number 1Z391-IS1
- ISO/IEC 17025:2005 "General Requirements for the Competence of Testing and Calibration" - Chemical Testing - Accredited A2LA Certificate Number 3031.01
- ISO 17034:2016 "General Requirements for the Competence of Reference Material Producers" - Reference Material Production - Accredited A2LA Certificate Number 3031.02

**Manufactured By:**



Shane Overcash

20 -Nov-2017

**Chemist I**

**Certified By:**

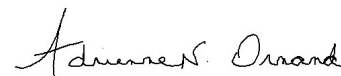


Andrea Tunnard

21 -Nov-2017

**Chemist I**

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