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Date manufactured: 5 -Sep-2017
Original issue date: 5 -Sep-2017

Certificate of Analysis

Date Received: _____
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Catalog No.:	Lot No.:	Storage:	Solvent:	Expiration Date:	Description:
DRE- GS09000444 DI	321168	≤ -10 °C	Methylene Chloride	25-Sep-2018	8270 App. IX Solution 16, Minus Benzidine, 2,000 mg/L, 5 x 1 ml (RM, ISO GUIDE 34)

Certified Values:

The certified value is based on gravimetric and volumetric preparation of this CRM. This CRM has been confirmed by gas chromatography (GC), gas chromatography/mass spectrometry (GC/MS), or High Performance Liquid Chromatography (HPLC) using an internally developed method against an independent source. The uncertainty value is calculated for a 95% confidence interval with a *k* value of 2.

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration, mg/L
2-acetylaminofluorene	53-96-3	99.9	72.7.1.2P	2006 +/-100
4-aminobiphenyl	92-67-1	99.9	73.29.1P	2006 +/-100
p-(dimethylamino)azobenzene	60-11-7	99.9	75.249.1.1P	1998 +/-100
isosafole	120-58-1	99.4	91.3.4P	2013 +/-100
1-naphthylamine	134-32-7	99.1	79.8.1.1P	1999 +/-100
2-naphthylamine	91-59-8	98	80.2.2.1P	2000 +/-100
5-nitro-o-toluidine	99-55-8	99.7	81.7.1.1P	2000 +/-100
n-nitrosodiethylamine	55-18-5	99.9	56.7.1P	2000 +/-100
n-nitrosodi-n-butylamine	924-16-3	99.8	55.7.2.1P	1996 +/-100
N-nitrosomethylethylamine	10595-95-6	99.5	60.3.17P	1998 +/-100
N-nitrosomorpholine	59-89-2	99.9	61.7.3.1P	2005 +/-100
N-nitrosopiperidine	100-75-4	99.5	62.3.5P	1998 +/-100
N-nitrosopyrrolidine	930-55-2	100	63.18.1P	1995 +/-100
p-phenylenediamine	106-50-3	100	83.1.4P	2003 +/-100
2-picoline	109-06-8	99.5	100.1.1P	1998 +/-100
o-toluidine	95-53-4	99.9	84.7.1P	2000 +/-100

Intended Uses:

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Catalog No.: DRE-

Lot No.: 321168

Expiration Date: 25-Sep-2018

This Certified Reference material (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 EN, ISO, EPA, and ASTM methods.

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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:

$$\% \text{ Change} = (-0.018 \ln(x+31) + 0.1157) + 636.54y^{-3.202}$$

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 acceptable error for their process is and calculate the maximum number of days the opened ampoule should be stored.

Method of Preparation:

All weights are traceable through N. I. S. T. Test No. 822/264157-00. Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetrically.

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 in a sealed ampoule. Once opened, the expiration is determined by user specifications.

Glassware Calibration:

Only Class A glassware is 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 within a calibration laboratory recognized by NIST as Echelon I. Balances are checked daily in accordance to in house procedures. Balances are calibrated annually by an ISO/IEC 17025:2005 and ISO Guide 34:2009 accredited metrology service.

Homogeneity:

Random replicate samples of the final packaged CRM have been analyzed to prove homogeneity in accordance with internal procedures. This is consistent with the intended use of this CRM. The homogeneity of this product has been confirmed by procedures consistent with ISO/IEC guide 17025:2005 and ISO guide 34:2009.

Hazardous Information:

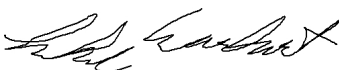
Refer to MSDS

Manufactured By:




Kayla Dennin
Chemist I

Certified By:



Lukas Earhart
Chemist I

Released By:



HuiChen Stavros, Ph.D.
Quality Control Manager

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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 $u_c = \sqrt{\sum u_i^2}$ where u_i are the individual uncertainty components for characterization, transportation, homogeneity, and shelf life.

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. This standard is guaranteed until 25-Sep-2018

Accreditation:

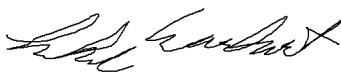
This standard was manufactured by an ISO 17025 Chemical Testing Lab (Certificate number 3031.01) and ISO Guide 34 Reference Material Producer (RMP) Certificate number 3031.02 accredited by The American Association of Laboratory Accreditation (A2LA). Manufacturer's Quality System audited and registered by NSF-ISR to ISO 9001:2008 (Certificate number IZ391-IS4).

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