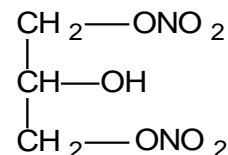


# Certificate of Analysis

## 1,3-Dinitrolycerin

Cerilliant Quality
ISO GUIDE 34 CERTIFICATE AR1353
ISO/IEC 17025 CERTIFICATE AT1352
ISO 9001:2008 CERTIFICATE 3854

**Catalog Number:** D-003  
**Solution Lot:** FN011311-04  
**Expiration Date:** January 2016  
**Solvent:** Acetonitrile  
**Volume per Ampule:** Not less than 1 mL  
**Storage:** Store in freezer.  
**Intended Use:** For laboratory use only. Not suitable for human or animal consumption.  
**Safety:** Flammable, Poison



- Expiration Date has been established through real time stability studies.
- Ampules are overfilled to ensure a minimum 1 mL volume fill. We advise laboratories to use measured volumes of this standard solution before diluting to the desired concentration.

Component	Chromatographic Purity	Certified Concentration
1,3-Dinitrolycerin	99.3%	100.0 ± 0.6 µg/mL
<ul style="list-style-type: none"> <li>• Uncertainty of the concentration is expressed as an expanded uncertainty in accordance with ISO 17025 and Guide 34 at the approximate 95% confidence interval using a coverage factor of k = 2 and has been calculated by statistical analysis of our production system and incorporates uncertainty of the purity factor, material density, and balance and weighing technique.</li> <li>• Concentration is corrected for chromatographic purity, residual water, residual solvents and residual inorganics.</li> </ul>		

### Solution Standard Verification and Homogeneity

Standard Solution	Lot Number	Verified Concentration (µg/mL)		%RSD - Homogeneity	
		Actual Results	Acceptance Criteria	Actual Results	Acceptance Criteria
New Lot	FN011311-04	100.0	± 3%	1.2	≤ 3%
Previous Lot	29875-230	103.0	± 3%		
<ul style="list-style-type: none"> <li>• Concentration is verified through multiple analyses and is calculated as the average of multiple analyses compared to an independently prepared calibration solution.</li> <li>• Homogeneity of the New Lot is ensured through rigorous production process controls statistically analyzed to evaluate risk and verified by analysis. The % RSD of samples pulled from across the lot demonstrate homogeneity of the New Lot.</li> </ul>					

### Traceability

- Gravimetrically prepared using qualified balances calibrated semi-annually by Mettler Toledo using NIST traceable weights. Calibration verification performed weekly and prior to each use utilizing NIST traceable weights. Each balance has been assigned a minimum weighing by Mettler Toledo taking into consideration the balance and installed environmental conditions to ensure weighing complies with USP tolerances of no more than 0.1% relative error.
- Concentration is verified against an independently prepared calibration solution gravimetrically prepared using balances calibrated to NIST.
- In addition, each neat material utilized has been identified and thoroughly characterized through the use of multiple analytical techniques. Spectral data is provided on subsequent pages of the COA.

Cerilliant certifies that this standard meets the specifications stated in this certificate and warrants this product to meet the stated acceptance criteria through the expiration/retest date when stored unopened as recommended. Product should be used shortly after opening to avoid concentration changes due to evaporation. Warranty does not apply to ampoules stored after opening.



  
 Lara Sparks, Quality Assurance Director

May 9, 2012  
 Date

### Standard Solution Assay Parameters

**Analysis Method:** UV/Vis  
**Wavelength:** 214 nm  
**Slit Width:** 1.0 nm  
**Response:** 0.5 s

### Calibration Curve

**Calibration Curve:** Linear Regression  
**Number of Points:** 4  
**Linearity (r):** 0.999

### Neat Material Data

**Compound Name:** 1,3-Dinitroglycerin      **Chemical Formula:** C<sub>3</sub>H<sub>6</sub>N<sub>2</sub>O<sub>7</sub>  
**Compound Lot:** 29875-23      **CAS Number:** 623-87-0  
**Chromatographic Purity:** 99%      **Molecular Weight:** 182.09

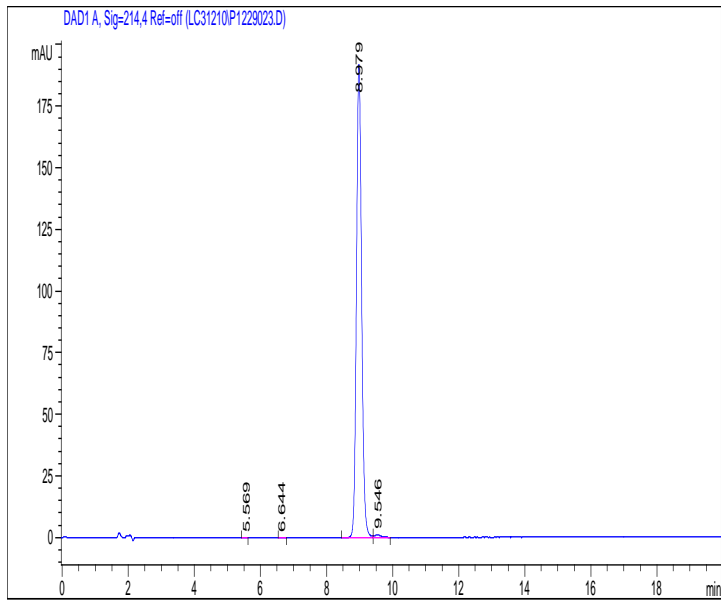
#### Neat Material Characterization Summary

Analytical Test	Method	Results
Primary Chromatographic Purity by HPLC/PDA Analysis	SP10-0102	99.3%
Secondary Chromatographic Purity by TLC Analysis	SP10-0106	Single Spot, R <sub>f</sub> = 0.41
Identity by LC/MS Analysis	SP10-0107	Consistent with Structure
Identity by <sup>1</sup> H-NMR Analysis	USP <761>, SP10-0116	Consistent with Structure
Residual Solvent Analysis by <sup>1</sup> H-NMR	USP <761>, SP10-0116	None Detected
Residual Water Analysis by Karl Fischer Coulometry	USP <921>, SP10-0103	0.33%
Purity Factor		99.00%

- ♦ Primary purity is calculated as the average of two independently performed analyses utilizing two different methods. Acceptance criteria requires the purity values to be within 0.5% of each other.
- ♦ The primary chromatographic purity value is used to calculate the Purity Factor.
- ♦ A secondary chromatographic purity method is utilized as a control.
- ♦ Purity Factor = [(100 - wt% residual solvent - wt% residual water - wt% residual inorganics) x Chromatographic Purity/100].
- ♦ Purity factor does not include adjustment for chiral and/or isotopic purity.

**Spectral and Physical Data**

**HPLC/PDA**

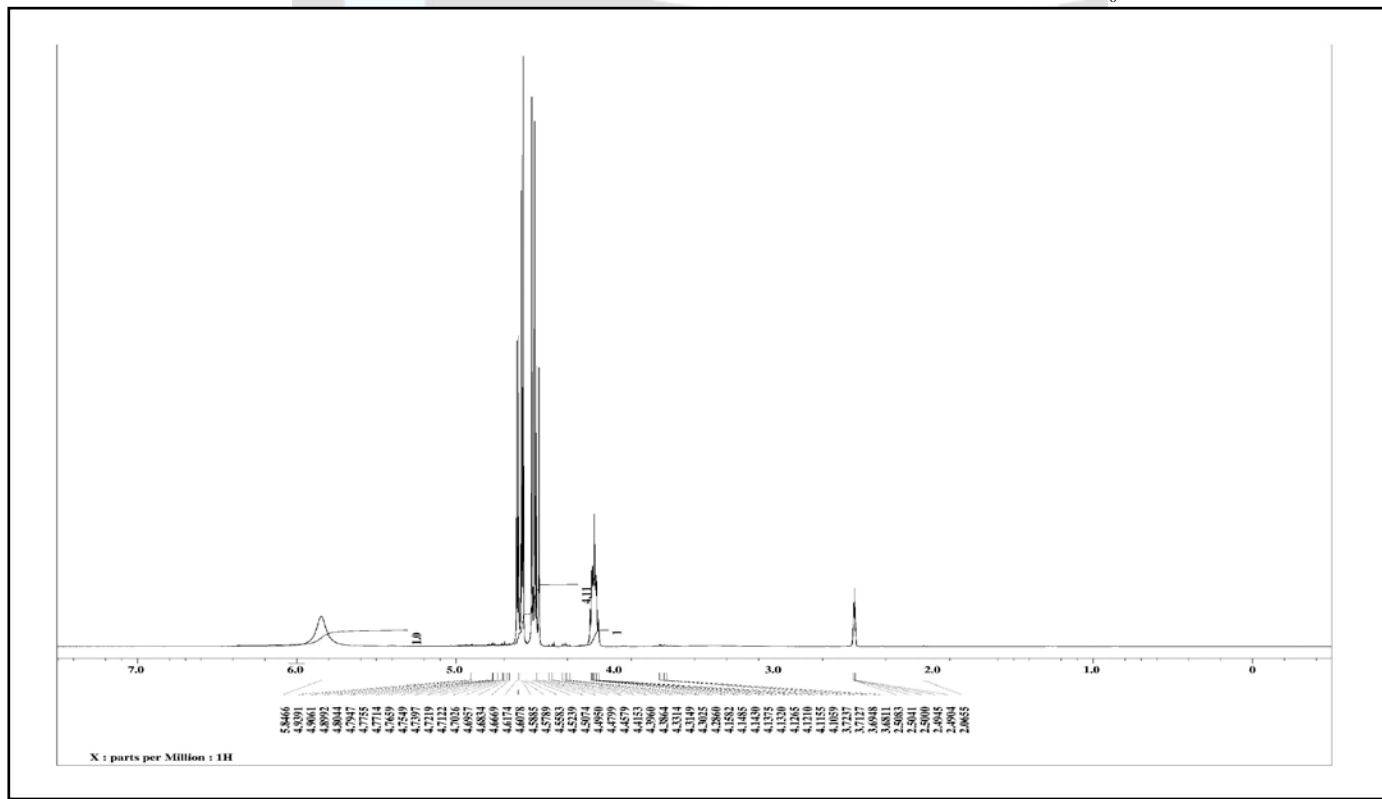


**Column:** Prodigy ODS 3 5μ, 4.6 x 250 mm  
**Mobile Phase:** Acetonitrile::0.02% H<sub>3</sub>PO<sub>4</sub> (25::75)  
**Flow Rate:** 1.5 mL/min  
**Wavelength:** 214 nm  
**Data File Name:** S:\HPLC\HPLC3\2010\LC31210\P1229023.D  
**Operator:** GLP  
**Instrument:** LC#3  
**Sample Name:** 29875-23  
**Method File:** RMD025-1.M  
**Acquired:** December 29, 2010 8:45 PM

Peak #	Ret Time	Area	Height	Area %
1	5.57	0.34	0.06	0.02
2	6.64	0.72	0.10	0.03
3	8.98	2096.74	192.04	99.30
4	9.55	13.81	1.09	0.65

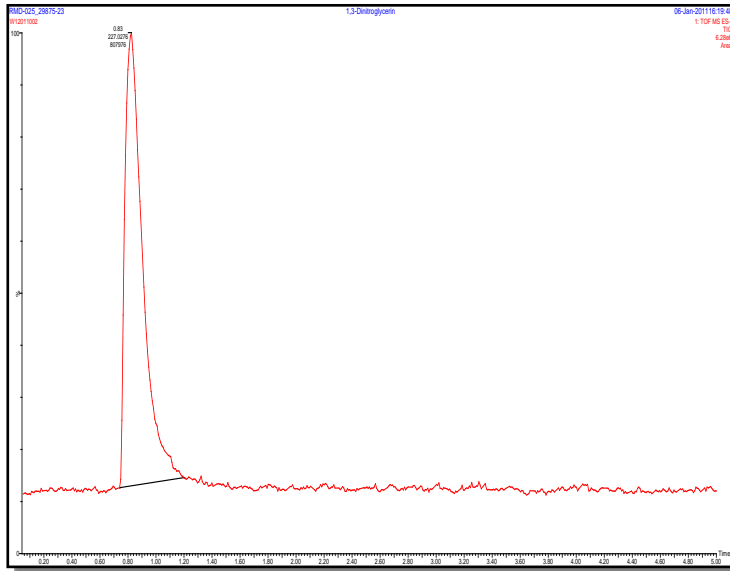
**<sup>1</sup>H NMR**

**Instrument:** JEOL ECS 400  
**Solvent:** DMSO-D<sub>6</sub>

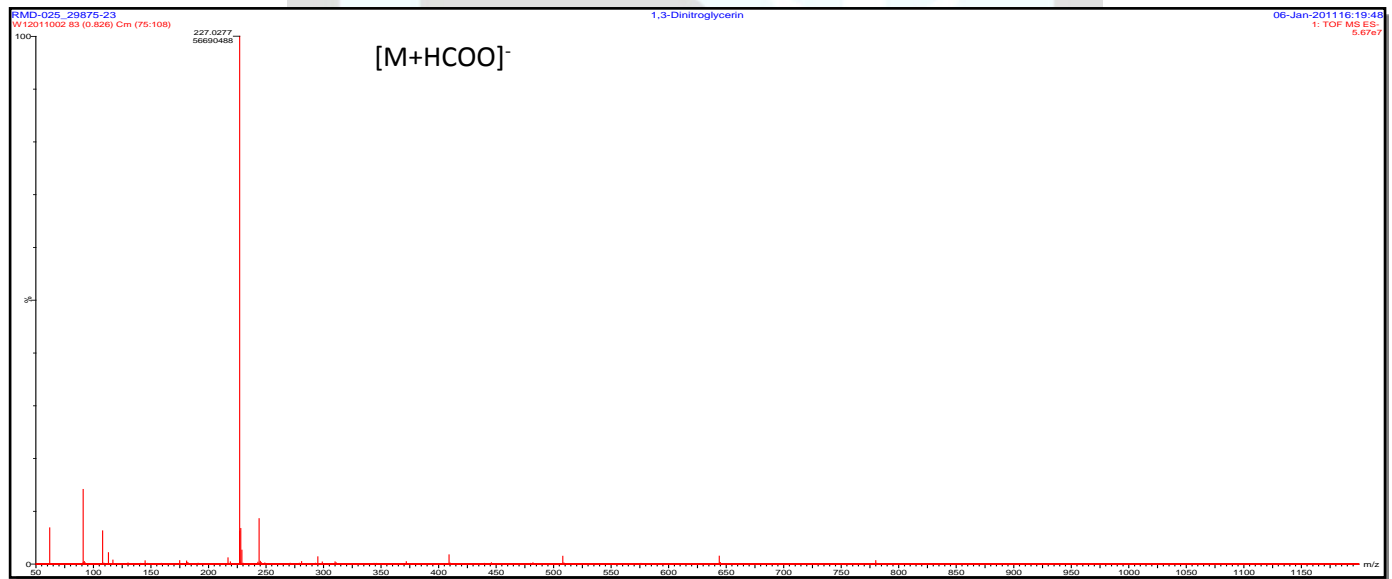


Spectral and Physical Data (cont.)

LC/MS



**Column:** Acquity UPLC BEH C18, 1.7µm. 2.1 x 50 mm  
**Mobile Phase:** 0.1% Formic acid in Acetonitrile::0.1% Formic acid in Water (25::75)  
**Flow Rate:** 0.5 mL/min  
**Scan Range:** 50-1200 amu  
**Ionization:** Electrospray, Negative Ion  
**Data File Name:** W12011002  
**Operator:** JDC  
**Instrument:** QTOF  
**Sample Name:** 29875-23  
**Method File:** ISO 5050C1  
**Acquired:** January 6, 2011 4:19 PM



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### *COA Revision History*

<b>Revision No.</b>	<b>Date</b>	<b>Reason for Revision</b>
00	2/11/2011	Initial version
01	5/9/2012	Corrected units for verified concentration from mg/mL to µg/mL

