Australian Government
Department of Industry, Science and Resources
National Measurement Institute
NATA WORLD RECOGNISED ACCREDITATION

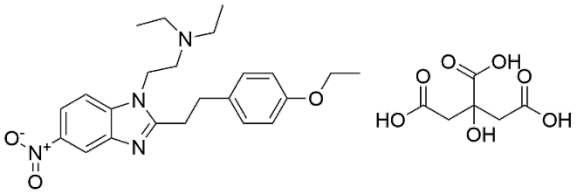
REFERENCE MATERIAL PRODUCT INFORMATION SHEET

NMIA D1092: Ethylene Etonitazene Citrate

Report ID: D1092.2026.01 (Ampouled 260521)

Chemical Formula: $C_{23}H_{30}N_4O_3 \cdot C_6H_8O_7$

Molecular Weight: 602.6 g/mol (citrate), 410.5 g/mol (base)



Property value

Batch №	CAS №	Purity by GC-FID
25-D-05	**805984-43-4 (base)**	**98.9 ± 0.5%**

The uncertainty has been calculated according to ISO 33405 and is based on the standard deviation of 10 samples analysed in duplicate stated at the 95 % confidence limit (k = 2).

IUPAC name: 2-(2-(4-Ethoxyphenethyl)-5-nitro-1H-benzo[*d*]imidazol-1-yl)-*N*,*N*-diethylethan-1-amine 2-hydroxypropane-1,2,3-tricarboxylate.

Expiration of certification: The property values are valid till 25 May 2029, three years from the date of certification provided the **unopened** material is handled and stored in accordance with the recommendations below. The material as issued in the unopened container and stored as recommended below should be suitable for use beyond this date, subject to confirmation of batch stability from the issuing body. The expiry date/shelf life does not apply to sample bottles that have been opened. In such cases it is recommended that the end-user conduct their own in-house stability trials. The material will be re-tested periodically to ensure that the property values are still valid. In the event a product fails the stability trial, notification will be sent to all impacted customers.

Description: Yellow solid prepared by synthesis and certified for identity and purity by NMI Australia. The analyte is supplied as a dried aliquot (~1 mg) in a sealed ampoule under an atmosphere of argon, intended for single use to prepare a standard solution containing D1092.

Intended use: This reference material is recommended for qualitative analysis only and is not intended for use as a calibrator. The material does not have certified reference material status as metrological traceability of the stated purity value to the SI unit for mass (kg) has not been established.

Instructions for use: Equilibrate the ampouled material to room temperature before opening. Open the ampoule and carefully rinse the interior at least three times, each time with a minimum of 0.5 mL of a suitable organic solvent (e.g., acetone or methanol). This process will ensure the transfer of the stated mass per ampoule of ethylene etonitazene citrate.

Recommended storage: When not in use, this material should be stored at or below 4 ºC in a closed container in a dry, dark area.

Stability: In the absence of long-term stability data, the measurement uncertainty at the 95 % coverage interval has been expanded to accommodate any potential change in the property value. The stability component has been estimated from stability trials conducted on similar materials by NMI Australia over the last ten years. The measurement uncertainty at the 95 % confidence interval also includes a stability component determined from accelerated stability trials conducted at 40 ºC and 75 % humidity for 7 days. The measurement uncertainty includes components for long term stability at the recommended storage conditions, and accelerated stability trials conducted at 40 ºC and 75 % humidity for 7 days.

The long-term stability of the compound in solution has not been examined.

Homogeneity assessment: The homogeneity of the material was assessed using purity assay by GC-FID on ten randomly selected ampoules of the material. The material was judged to be sufficiently homogeneous at this level of sampling as the variation in analysis results between samples was not significantly different at a 95 % confidence level from that observed on repeat analysis of the same sample.

Safety: Treat as a hazardous substance. Use appropriate work practices when handling to avoid skin or eye contact, ingestion or inhalation of dust. Refer to the provided safety data sheet.

S. R. Davies

Dr Stephen R. Davies,
Team Leader,
Chemical Reference Materials, NMI.
14 July 2026

NATA Accreditation No. 198 / Corporate Site No. 14214.

Characterisation Report:

The identity was confirmed by a range of spectroscopic techniques including NMR and MS. The indicative purity value was obtained by GC-FID. Supporting evidence is provided by NMR.

Warning: **This material is sensitive to the quality of the silanised glass liner when injected into a GC instrument at elevated temperatures above 210 ºC.**

GC-FID:	Instrument:	Agilent 8890
	Column:	HP-1MS, 29.9 m × 0.32 mm I.D. × 0.25 µm
	Program:	180 °C (1 min), 30 °C/min to 280 °C (20 min), and 30 °C/min to 300 °C (5 min)
	Injector:	210 °C
	Detector Temp:	320 °C
	Carrier:	Helium, 2 mL/min
	Split ratio:	20/1
	Relative peak area of the main component as the free base:	
	Initial analysis:	Mean = 98.8 %, s = 0.03 % (10 sub-samples in duplicate, May 2026)
GC-FID:	Instrument:	Agilent 8890
	Column:	HP-5, 30 m × 0.32 mm I.D. × 0.25 µm
	Program:	180 °C (1 min), 30 °C/min to 280 °C (20 min), and 30 °C/min to 300 °C (5 min)
	Injector:	210 °C
	Detector Temp:	320 °C
	Carrier:	Helium, 2 mL/min
	Split ratio:	20/1
	Relative peak area of the main component as the free base:	
	Initial analysis:	Mean = 98.9 %, s = 0.02 % (10 sub-samples in duplicate, May 2026)

Spectroscopic and other characterisation data

GC-MS:	Instrument:	Agilent 6890/5973
	Column:	HP-5MS, 30 m × 0.25 mm I.D. × 0.25 μm
	Program:	55 °C (3 min), 30 °C/min to 300 °C, 20 °C/min to 320 °C (3 min)
	Injector:	240 °C
	Split ratio:	20/1
	Transfer line temp:	300 °C
	Carrier:	Helium, 1.2 mL/min
	Scan range:	40–500 *m/z*
	The retention time of ethylene etonitazene (free base) is reported with the major peaks in the mass spectra. The latter are reported as mass/charge ratios and (in brackets) as a percentage relative to the base peak.	
	Parent (15.9 min):	135 (1), 107 (10), 87 (6), 86 (100), 77 (2), 58 (4), 44 (1) *m/z*
ESI-MS:	Instrument:	Shimadzu LC-TQ-MS 8045
	Operation:	Negative ion mode, direct infusion at 10 μL/min
	Ionisation:	ESI spray voltage at −3 kV negative ion
	Scan range:	150–550 *m/z*
	Peak:	409.2 $[M-H]^-$ *m/z*
^{1}H-NMR (citrate salt):	Instrument:	Bruker Avance III-500
	Field strength:	500 MHz
	Solvent:	DMSO-d_6 (2.50 ppm)
	Spectral data:	δ 0.83 (6H, t, *J* = 7.1 Hz), 1.30 (3H, t, *J* = 7.0 Hz), 2.61 (2H, d, *J* = 15.2 Hz), 2.63 (4H, q, *J* = 7.1 Hz), 2.70 (2H, d, *J* = 15.2 Hz), 2.80 (2H, t, *J* = 6.5 Hz), 3.12 (2H, m), 3.22 (2H, m), 3.97 (2H, q, *J* = 7.0 Hz), 4.35 (2H, t, *J* = 6.5 Hz), 6.84 (2H, d, *J* = 8.6 Hz), 7.20 (2H, d, *J* = 8.6 Hz), 7.75 (1H, d, *J* = 9.0 Hz), 8.15 (1H, dd, *J* = 2.2, 8.9 Hz), 8.47 (1H, d, *J* = 2.2 Hz) ppm
	Diethyl ether and acetic acid estimated at 0.13% and 0.03% relative mass fraction, respectively, was observed by ^{1}H NMR.	
^{13}C NMR (citrate salt):	Instrument:	Bruker Avance III-500
	Field strength:	126 MHz
	Solvent:	DMSO-d_6 (39.52 ppm)
	Spectral data:	δ 10.9, 14.7, 28.8, 31.5, 41.4, 43.2, 46.7, 51.2, 62.9, 72.1, 110.7, 114.3, 114.5, 117.4, 129.4, 132.7, 139.7, 141.5, 142.5, 157.0, 159.3, 171.3, 175.3 ppm
^{1}H NMR (free base):	Instrument:	Bruker Avance III-500
	Field strength:	500 MHz
	Solvent:	DMSO-d_6 (2.50 ppm)
	Spectral data:	δ 0.70 (6H, t, *J* = 7.1 Hz), 1.30 (3H, t, *J* = 7.0 Hz), 2.39 (4H, q, *J* = 7.0 Hz), 2.60 (2H, t, *J* = 6.0 Hz), 3.11 (2H, m), 3.22 (2H, m), 3.97 (2H, q, *J* = 7.0 Hz), 4.24 (2H, t, *J* = 6 Hz), 6.83 (2H, d, *J* = 8.6 Hz), 7.19 (2H, d, *J* = 8.6 Hz), 7.72 (1H, d, *J* = 9.0 Hz), 8.12 (1H, dd, *J* = 2.2, 9.0 Hz), 8.45 (1H, d, *J* = 2.2 Hz) ppm
^{13}C-NMR (free base):	Instrument:	Bruker Avance III-500
	Field strength:	126 MHz
	Solvent:	DMSO-d_6 (39.52 ppm)
	Spectral data:	δ 11.7, 14.7, 28.9, 31.6, 42.6, 46.8, 52.0, 62.8, 110.6, 114.3, 114.4, 117.2, 129.3, 132.7, 139.8, 141.4, 142.4, 156.9, 159.4 ppm
Melting point (hot stage):		129–134 °C