

**DIETHYLENETRIAMINE**  
**See ETHYLENEDIAMINE, Method 2540, for Procedure**

$\text{HN}_2(\text{CH}_2)_2\text{NH}(\text{CH}_2)_2\text{NH}_2$

MW: 103.2

CAS: 111-40-0

RTECS: IE1225000

**METHOD:** 2540, Issue 2

**EVALUATION:** UNRATED

**Issue 1:** 15 May 1989

**Issue 2:** 15 August 1994

**OSHA :** no PEL  
**NIOSH:** 1 ppm (skin)  
**ACGIH:** 1 ppm (skin)  
 (1 ppm = 4.21 mg/m<sup>3</sup>)

**PROPERTIES:** liquid; d 0.96 g/mL @ 20 °C;  
 BP 206.7 °C; VP 0.5 kPa (0.37 mm Hg);  
 flash point 98 °C

**SYNONYMS:** diethylenetriamine; DETA; aminoethylethandiamine; 3-azapentane-1,5-diamine; bis(2-aminoethyl)amine

SAMPLING		MEASUREMENT	
<b>SAMPLER:</b>	SOLID SORBENT TUBE (1-naphthylisothiocyanate-coated XAD-2, 80 mg/40 mg)	<b>TECHNIQUE:</b>	HPLC, UV DETECTION
<b>FLOW RATE:</b>	0.01 to 0.1 L/min [1]	<b>ANALYTE:</b>	naphthylisothiourea derivative of analytes
<b>VOL-MIN:</b>	1 L @ 10 ppm	<b>DESOPTION:</b>	2 mL dimethylformamide (DMF), ultrasonic 30 min
<b>-MAX:</b>	20 L	<b>INJECTION VOLUME:</b>	10 µL
<b>SHIPMENT:</b>	routine	<b>COLUMN:</b>	10-µm radial cyano, 10 cm x 8-mm ID in Waters RCM-100 radial compression mode
<b>SAMPLE STABILITY:</b>	>30 days @ 20 °C [2]	<b>MOBILE PHASE:</b>	50/50 isotane/ isopropanol at 3 mL/min
<b>BLANKS:</b>	2 to 10 field blanks per set	<b>CALIBRATION:</b>	standard solutions of derivatives in DMF
<b>ACCURACY</b>		<b>RANGE:</b>	1 to 80 µg per sample
<b>RANGE STUDIED:</b>	0.016 to 8 mg/m <sup>3</sup> ; (10-L sample)	<b>ESTIMATED LOD:</b>	0.16 µg per sample
<b>OVERALL PRECISION (<math>\hat{S}_{r,t}</math>):</b>	0.06 [1]	<b>PRECISION (<math>\hat{S}_t</math>):</b>	0.007
<b>BIAS:</b>	- 1.9 %		
<b>ACCURACY:</b>	± 13.5%		

**APPLICABILITY:** The working range for DETA is 0.05 to 150 mg/m<sup>3</sup> for a 10-L air sample. This method is the result of evaluation [2] of OSHA Method #60 for DETA, EDA, TETA [1]. The theoretical capacity of each front section is 1.5 mg of DETA.

**INTERFERENCES:** Other primary or secondary amines may react with the sampler coating reagent, and thereby reduce the sampler capacity.

**OTHER METHODS:** This replaces NIOSH Method P&CAM 276 [3]. The method of Anderson, et al., for EDA [4] is an alternate method using thiourea derivatization and HPLC analysis.