TRIETHYLENETETRAMINE
See ETHYLENEDIAMINE, Method 2540, for Procedure

$(NH_2CH_2CH_2NHCH_2)_2$ MW: 146.2 CAS: 112-24-3 RTECS: YE6650000

METHOD: 2540, Issue 2 **EVALUATION: UNRATED** **Issue 1: 15 May 1989**
Issue 2: 15 August 1994

OSHA : no PEL
NIOSH: no REL
ACGIH: no TLV
(1 ppm = 5.98 mg/m^3)

PROPERTIES: liquid; d 0.98 g/mL @ 20 °C; BP 277.4 °C; VP unknown; flash point 118 °C

SYNONYMS: triethylenetetramine: TETA; trientine; N,N-bis(2-aminoethyl)-1,2-diaminoethane; 3,6-diazaoctane-1,8-diamine

SAMPLING

SAMPLER: SOLID SORBENT TUBE (1-naphthylisothiocyanate-coated XAD-2, 80 mg/40 mg)

FLOW RATE: 0.01 to 0.1 L/min [1]

VOL-MIN: 1 L @ 10 ppm
-MAX: 20 L

SHIPMENT: routine

SAMPLE STABILITY: >30 days @ 20 °C [2]

BLANKS: 2 to 10 field blanks per set

ACCURACY

RANGE STUDIED: 0.016 to 8 mg/m^3; (10-L samples)

OVERALL PRECISION ($\hat{S}_{rT}$): 0.06 [1]

BIAS: -1.9%

ACCURACY: ±13.7%

MEASUREMENT

TECHNIQUE: HPLC, UV DETECTION

ANALYTE: naphthylisothiourea derivative of analytes

DESORPTION: 2 mL dimethylformamide (DMF), ultrasonic 30 min

INJECTION VOLUME: 10 µL

COLUMN: 10-µm radial cyano, 10 cm x 8-mm ID in Waters RCM-100 radial compression mode

MOBILE PHASE: 50/50 isoctane/isopropanol at 3 mL/min

CALIBRATION: standard solutions of derivatives in DMF

RANGE: 1 to 119 µg per sample

ESTIMATED LOD: 0.3 µg per sample

PRECISION ($\hat{S}_r$): 0.018

APPLICABILITY: The working range for TETA is 0.08 to 160 mg/m^3 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 1.6 mg of TETA.

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.