(PREVIEW)

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Indian Standard

WORKPLACE AIR — DETERMINATION OF ORGANONITROGEN COMPOUNDS IN AIR USING LIQUID CHROMATOGRAPHY AND MASS SPECTROMETRY

PART 1 ISOCYANATES USING DIBUTYLAMINE DERIVATIVES

1 Scope

This part of ISO 17734 gives general guidance for the sampling and analysis of airborne isocyanates in workplace air. When amines and aminoisocyanates are suspected to be emitted (e.g. from thermal degradation of PUR), it is recommended that in addition to isocyanates the amines and aminoisocyanates in air are determined, using DBA and ethyl chloroformate as reagents (ISO 17734-2).

The method is suitable for the determination of a wide range of different isocyanates in both the gas and particle phases. Typical monofunctional isocyanates that can be determined are isocyanic acid (ICA), methyl isocyanate (MIC), ethyl isocyanate (EIC), propyl isocyanate (PIC), butyl isocyanate (BIC), and phenyl isocyanate (PhI). Typical monomeric diisocyanates include 1,6-hexamethylene- (HDI), 2,4- and 2,6-toluene- (TDI), 4,4'-diphenylmethane- (MDI), 1,5-naphthyl- (NDI), isophorone- (IPDI), and 4,4'-dicyclohexylmethane diisocyanate (HMDI). Multifunctional isocyanates that can be determined are typically oligomers in polymeric MDI, biuret-, isocyanurate-, and allophanate-adducts and prepolymeric forms of isocyanates.

The instrumental detection limit for aliphatic isocyanates is about 50 fmol and for aromatic isocyanates, it is 2 fmol. For a 15-l air sample, this corresponds to 0,6 ng·m^{-3} for HDI and 0,02 ng·m^{-3} for TDI.

The useful range, for a 5-l air sample, of the method is approximately 0,001 µg·m^{-3} to 200 mg·m^{-3} for TDI.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 16200-1:2001, *Workplace air quality — Sampling and analysis of volatile organic compounds by solvent desorption/gas chromatography — Part 1: Pumped sampling method*

ISO 5725-2:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method* (including Technical Corrigendum 1:2002)