114 Methyl Isocyanate

Synonyms: isocyanic acid methyl ester, isocyanatomethane, MIC; formula: CH₃N=C=O; MW 57.05; CAS [624-83-9]; used in the manufacture of carbamate pesticides; colorless liquid with an unpleasant odor; boils at 39°C; freezes at −80°C; vapor pressure 400 torr at 20°C; density 0.96 g/mL at 20°C; vapor density 1.97 (air = 1); decomposes in water; soluble in most organic solvents; highly toxic and flammable.

AIR ANALYSIS

- Air drawn through a glass tube containing ion exchange resin XAD-2; MIC desorbed from the resin into a solution of fluorescamine (Fluram) in tetrahydrofuran; an intense fluorescent derivative formed; derivative analyzed by HPLC using a multiwavelength fluorescent detector (Vincent and Ketcham, 1980); recommended air flow rate 200 mL/min; sample volume 15 L.
  - The detection limit is 0.02 ppm.
  - Chemical name for fluorescamine is 4-phenylspiro[furan-2(3 H),1-phthalan]3,3′-dione.
  - Silica gel may be alternatively used as an adsorbent; the method sensitivity, however, is greater with Amberlite XAD-2.
  - Monomethylamine interferes in the test; interference is removed by passing air through an impinger containing 0.5% CuCl₂ solution before drawing the air through the solid adsorbent.
  - A reverse phase column, such as Varian CH-10 or equivalent, is suitable for separation.

(1 ppm MIC in air = 2.33 mg/m³ at NTP)

REFERENCE
