

(16) **Methyldiethanolamine, C₅H₁₃NO₂**
CAS 105-59-9
HS No. 29.22.19.00
NIOSH/RTECS No. KL 7525000

Synonyms: MDEA; 2,2'-methyliminodiethanol

Physical properties: MW: 119.2; mp: -21°C; bp: 247°C, d.1.028; n_d²⁰1.4694; liquid with an amine-like odour that discolours on storage unless additives present; readily soluble in water, alcohol and acetone.

Synthesis: N-alkylated ethanolamines are produced by the reaction of amines, RNH₂, with ethylene oxide with the latter being added to the amine. The reaction temperature is in the range of 50-170°C, under pressure (0.3 to 4 MPa) with water used to accelerate the reaction. Reaction with primary amines leads to two products, the N-alkylethanolamine and the N-alkyldiethanolamine; the former are best prepared by a continuous process. N-alkylethanolamines can also be prepared by the N-alkylation of ethanolamines. Methylamine is the amine used to prepare this ethanolamine.

Reactivity: Chemical properties correspond to those of the unsubstituted ethanolamines. They react with acid derivatives to form esters. They are converted to N-substituted morpholines by reaction with H₂SO₄ at high temperatures. Thermal decomposition leads to CO, CO₂ and NO_x.

Toxicity: Harmful if inhaled or swallowed, irritating to skin, eyes and mucous membranes. LD₅₀ (oral) is 4780 mg/kg (rat).

Uses: Mainly used in the production of pharmaceuticals, flocculents, crop protection chemicals, paper and leather chemicals and in plastics. It is the precursor of bis (2-chloroethyl) methylamine which is used in the treatment of Hodgkins disease and leukemias as chlormethine (caryolysine) as well as the chemical warfare agent HN2.

Suppliers: There are six producers listed in four countries; USA (2), Japan (1), Germany (2) and Netherlands (1).