



>>Entry Name: Azidotrimethylsilane, 9CI

Synonym(s): Trimethylsilyl azide

CAS Registry Number: 4648-54-8

Me₃SiN₃

Molecular Formula: C₃H₉N₃Si

Molecular Weight: 115.21

Accurate Mass: 115.056574

Percentage Composition: C 31.28%; H 7.87%; N 36.47%; Si 24.38%

Source/Synthesis: Synth. from Me₃SiCl + NaN₃ in DMF

Use/Importance: Commercially available alternative reagent to HN₃. In presence of *N*-bromosuccinimide causes azidobromination of alkenes. With acetylenes → 1,2,3-triazoles. Used in synth. of 3-subst. uracils. Cleaves epoxides → *trans*-siloxy azides; substitutes benzyl, acyl, allyl, aliphatic halides → azides; reacts with acyl halides, catalysed by KN₃, 18-crown-6 → isocyanate which reacts with HCl → amine; adds to aldehydes, ketones in presence of ZnCl₂ or SnCl₂ → *gem*-diazides and with NaN₃ or 15-crown-5 → α-siloxy azides; with Et₂AlF, cleaves 2,3-epoxyalcohols regio- and stereoselectively → *anti*-3-azido-1,2-diols; with PhI(OAc)₂, reacts with simple acyclic and cyclic alkenes → α-azido ketones

Physical Description: Liq.

Melting Point: Mp -95°

Boiling Point: Bp₇₂₀ 95°. Bp₁₇₅ 52-53°

Density: d₄²⁰ 0.87

Refractive Index: n_D²⁰ 1.4140

Hazard & Toxicity: Flammable. Toxic by inhalation, liberating hydrazoic acid which is a potent vasodilator. Explosion possible during prep.

Aldrich: 15507-1

Fluka: 92753

Sigma: T7385

References:

- Aldrich Library of FT-IR Spectra, 1st edn.*, 1985, **2**, 1112C, (*ir*)
Aldrich Library of FT-IR Spectra: Vapor Phase, 1989, **3**, 1651D, (*ir*)
Aldrich Library of NMR Spectra, 2nd edn., 1983, **2**, 1001B, (*nmr*)
Thayer, J.S. *et al.*, *Inorg. Chem.*, 1964, **3**, 889, (*synth, ir, uv*)
Birkofer, L. *et al.*, *Angew. Chem., Int. Ed.*, 1965, **4**, 417, (*use*)
Wiberg, N. *et al.*, *Chem. Ber.*, 1966, **99**, 740; 1967, **100**, 748, (*synth, ir, pmr*)
Fieser and Fieser's Reagents for Organic Synthesis, Wiley, 1967, **1**, 1236; 1972, **3**, 316; 1975, **5**, 719; 1977, **6**, 632; 1979, **7**, 394; 1981, **9**, 21; 1982, **10**, 14; 1984, **11**, 32; 1986, **12**, 37; 1988, **13**, 24; 1989, **14**, 25; 1990, **15**, 342, (*uses*)
Washburne, S.S. *et al.*, *J. Organomet. Chem.*, 1971, **33**, 153, (*synth, ir*)
Washburne, S.S. *et al.*, *J.O.C.*, 1972, **37**, 1738, (*use*)
Ehrenfreund, J. *et al.*, *Tetrahedron*, 1972, **28**, 1697, (*use, reaction with alkenes*)
Dakkouri, M. *et al.*, *Z. Naturforsch., A*, 1972, **27**, 1335, (*struct*)
Ehrenfreund, J. *et al.*, *Annalen*, 1973, 290, (*use, reaction with alkenes*)
MacMillan, J.H. *et al.*, *J.O.C.*, 1973, **38**, 2982, (*use, subst of acyl halides*)
Vorbrüggen, H. *et al.*, *Synthesis*, 1979, 35, (*use, reaction with C=O*)
Warren, J.D. *et al.*, *Synth. Commun.*, 1980, **10**, 107, (*use, reaction with acyl halides*)
Nishiyama, K. *et al.*, *Chem. Lett.*, 1982, 1477, (*use, subst of halides*)
Surya Prakash, G.K. *et al.*, *J.O.C.*, 1983, **48**, 3358, (*use, subst of acyl halides*)
Weber, W.P., *Silicon Reagents in Org. Synth.*, Springer-Verlag, Chapt. 4, 1983
West, R. *et al.*, *Chem. Eng. News*, June 11, 1984, 4, (*haz*)
Maruoka, K. *et al.*, *Chem. Lett.*, 1985, 599, (*use, epoxyalcohol cleavage*)
Kabalka, G.W. *et al.*, *Synth. Commun.*, 1988, **18**, 1363, (*use, hydroamination of alkenes*)
Nishiyama, K. *et al.*, *Synthesis*, 1988, 106, (*use, addn to aldehydes, ketones*)
Emziane, M. *et al.*, *Synthesis*, 1988, 541, (*use, epoxide cleavage*)
Sutowardoyo, K. *et al.*, *Tet. Lett.*, 1989, **30**, 4673, (*use*)
Olah, G.A. *et al.*, *Synlett*, 1990, 487, (*use*)
Bretherick, L., *Handbook of Reactive Chemical Hazards, 4th edn.*, Butterworths, 1990, 1237