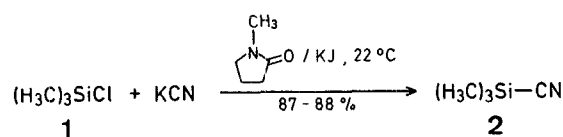


250% excess of potassium cyanide in boiling *N*-methylpyrrolidinone (16 h, yield: 71%)^{3,4}.

We report here that cyanotrimethylsilane (**2**) can be prepared in 87–88% yield by the reaction of equimolecular amounts of chlorotrimethylsilane (**1**) and potassium cyanide in the presence of 10 mol% of potassium iodide and 20 mol% of *N*-methylpyrrolidinone at room temperature for 12 h. Under these conditions, conversion is complete and the product can be distilled directly from the reaction flask. The reaction proceeds equally well if sodium cyanide and sodium iodide are used, the reaction conditions being the same. A third version using potassium or sodium cyanide and potassium or sodium iodide in the absence of *N*-methylpyrrolidinone is possible, but requires considerably longer reaction times (75 h).



The catalytic effect of potassium or sodium iodide in these reactions may be rationalized by assuming the intermediate formation of iodo-trimethylsilane which is known to be a highly reactive electrophile¹.

Cyanotrimethylsilane (**2**):

Performance of the reaction under an inert gas atmosphere is not necessary but exposure of the reaction mixture or the product to air should be avoided.

Method A, in *N*-Methylpyrrolidinone as Solvent: *N*-Methylpyrrolidinone (19.8 g, 0.2 mol) is gradually added to a stirred suspension of dry potassium cyanide (finely divided and having been kept in a drying pistol at 120°C under vacuum for 24 h before use; 65.1 g, 1 mol) and potassium iodide (16.6 g, 0.1 mol) in chlorotrimethylsilane (**1**; 108.2 g, 1 mol) in a dried round-bottom flask, and stirring is continued at room temperature for 12 h, after which time the ¹H-N.M.R. spectrum of the crude product indicates complete conversion. Product **2** is distilled directly from the reaction flask; yield: 86–87.2 g (87–88%); b.p. 112–117°C (Ref.³, b.p. 114–117°C); m.p. 7–10°C; purity: >96% (G.L.C. analysis, Chromosorb SE 30, 3% silicon, 70°C). The ¹H-N.M.R. (CCl₄/TMS) spectrum shows no impurities (singlet at δ=0.1 ppm).

The above reaction proceeds completely in the same manner when sodium cyanide and sodium iodide are used; yield: 87–88%.

Method B, without Solvent: A suspension of sodium cyanide (9.8 g, 0.2 mol) and sodium iodide (3.0 g, 0.02 mol) in chlorotrimethylsilane (**1**; 21.6 g, 0.2 mol) is vigorously stirred at room temperature for 75 h. Work-up as in Method A affords **2** having the same purity as in Method A; yield: 17 g (85%).

An Improved Synthesis of Cyanotrimethylsilane

M. T. REE* Z*, I. CHATZIOSIFIDIS

Fachbereich Chemie der Universität, Hans-Meerwein-Strasse, D-3550 Marburg, Federal Republic of Germany

Cyanotrimethylsilane (**2**) is an excellent reagent for a number of useful reactions such as the conversion of aldehydes and ketones into silylated cyanohydrins, which in turn are versatile synthetic intermediates¹. The currently best syntheses of **2** are the reaction of chlorotrimethylsilane (**1**) with a 22% excess of sodium cyanide in *N*-methylpyrrolidinone in the presence of a phase-transfer catalyst (30–36 h, 90–100°C; yield: 60–70%)² and the reaction of chlorotrimethylsilane (**1**) with a

Received: September 3, 1981
(Revised form: October 26, 1981)

* Address for correspondence.

¹ W. C. Groutas, D. Felker, *Synthesis* **1980**, 861.

² S. Hünig, G. Wehner, *Synthesis* **1979**, 522.

³ J. K. Rasmussen, S. M. Heilmann, *Synthesis* **1979**, 523.

⁴ Note added in proof: **2** can also be prepared in yields of 59–82% by the reaction of acetone cyanohydrin and lithium hydride followed by quenching the lithium cyanide with chlorotrimethylsilane; *Org. React.* **60**, 126 (1981).