THE POLYMERIZATION OF MONOVINYLALKYL(PHENYL) DERIVATIVES OF SILICON IN THE PRESENCE OF LITHIUM ETHYL

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Translated from Izvestiya Akademii Nauk SSSR, Otdelenie Khimicheskikh Nauk, No. 8, pp. 1497-1498, August, 1962
Original article submitted June 29, 1962

It is known that the polymerization of monovinylalkyl(phenyl) derivatives of silicon in the presence of peroxide initiators (even with the use of pressures up to 6000 atm), and even in the presence of ionic catalysts, does not result in the formation of products of high molecular weight [1, 2]. By using the Tsigler catalyst system, high molecular weight products were obtained from trimethylvinylsilane, but with a low degree of conversion: 2-3% [3].

Monomer	Catalyst, % of monomer	Time	Yield of solid polymer %	Time, yield of solid polymer, %	Mol. wt. *	M.p. °C	Silicon content of polymer, %	
							found	calculated
$(CH_3)_3SiCH = CH_2$	8	26	8	90	$2 \cdot 10^4$	280-300	27.0 26.8	28.03
$(CH_3)_2C_6H_5SiCH = CH_2$	8	25	8	85	$2 \cdot 10^4$	130	17.06 17.09	17.29

*The molecular weight was determined by the light dispersion method.

We studied the catalytic polymerization of trimethylvinylsilane and dimethylphenylvinylsilane in the presence of lithium ethyl. The polymerization was carried out at temperatures of from 0 to 50° at a lithium ethyl concentration of from 2 to 10%, based on the monomer. The lithium ethyl was used in a solution of n-heptane. The polymer obtained were white powdery substances. The results of some experiments are given in the table.

By polymerizing trimethylvinylsilane and dimethylphenylvinylsilane in the presence of lithium ethyl it was possible for the first time to obtain high molecular silico-organic compounds from these monomers in high yields (80-90%).

LITERATURE CITED

1. A. M. Polyakova, V. V. Korshak, A. A. Sakharova, A. D. Petrov, V. F. Mironov, and G. I. Nikishin, Izv. AN SSSR, Otd. Khim., 979 (1956).
2. M. Kanazashi, Bull. Chem. Soc., Japan, 28, 44 (1955).
3. S. Murahashi, S. Nozakura, and M. Jumi, Bull. Chem. Soc., Japan, 32, 670 (1959).