

# Zur Darstellung von Organosiliciumpolymeren mit $(-\text{SiH}_2-)_n$ -Gruppen

Synthesis of Organosilicon Polymers Containing  $(-\text{SiH}_2-)_n$ -Units

Wolfram Uhlig

Laboratorium für Anorganische Chemie der Eidgenössischen Technischen Hochschule  
Zürich, ETH-Zentrum, CH-8092 Zürich

Z. Naturforsch. **54b**, 270–277 (1999); eingegangen am 5. November 1998

Poly(silylenemethylene)s, Poly(silyleneethyne)s, Poly(silylenephenylene)s, Silyltriflates

Organosilicon polymers containing  $(\text{SiH}_2)$  or  $(\text{SiH}_2)_2$  units have been prepared via silyltriflate intermediates. Two methods of the formation of silicon-hydrogen bonds are described. Polysilaethylene  $[\text{SiH}_2-\text{CH}_2-]_n$  has been prepared by ring-opening polymerization of tetraphenyl-1,3-disilacyclobutane followed by a protodesilylation reaction with triflic acid and reduction with  $\text{LiAlH}_4$ . The reaction of  $\text{H}_2\text{Si}(\text{OTf})_2$  or  $(\text{TfO})\text{H}_2\text{Si}-\text{SiH}_2(\text{OTf})$  with organolithium or organomagnesium compounds gave poly(silyleneethyne)s  $[(\text{SiH}_2)_n-\text{C}\equiv\text{C}]_n$  and poly(silylenephenylene)s  $[(\text{SiH}_2)_n-\text{C}_6\text{H}_4-]_n$ . These polymers may serve as suitable precursors for ceramic materials. The TGA studies gave remarkably high ceramic yields. NMR measurements ( $^{29}\text{Si}$ ,  $^{13}\text{C}$ ,  $^1\text{H}$ ) indicate a regular alternating arrangement of silicon atoms and organic groups in the polymer backbone.

\* Reprint requests to Dr. W. Uhlig.