

**Redox Initiated Cationic Polymerization: Reduction of Dialkylphenacylsulfonium Salts by  
Silanes**

by

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## **ABSTRACT**

Silanes bearing Si-H groups reduce S,S-Dialkyl-S-phenacylsulfonium salts while in the presence of a noble metal catalyst. The resulting redox couple may be used as an initiator for the cationic polymerizations of epoxides, oxetanes, and vinyl ethers. The polymerizations of these monomers can be carried out in a conventional manner with neat monomer or under solution conditions. These polymerizations are normally rapid and exothermic. An original two-component redox system in which vaporized silane is delivered to a thin film of monomer, sulfonium salt, and noble metal catalyst is studied. Optical pyrometry (infrared thermography) is used to examine and optimize the kinetics of the abovementioned cationic polymerizations. The structural variations of sulfonium salts, silanes, and noble metal catalysts on the polymerizations of various vinyl and heterocyclic monomers were studied.