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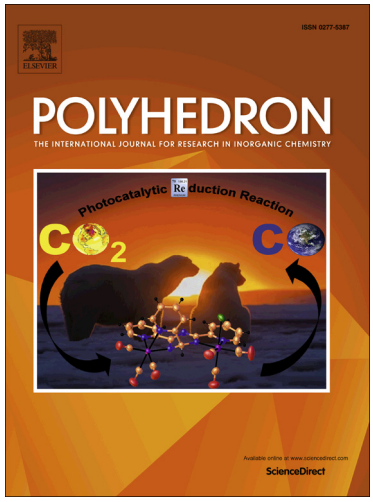

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Novel Route to Silanetriols and Silanediols based on Acetoxysilylalkoxides

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Silanols • Hydrolysis • Acetoxysilylalkoxides • Structural study • CO_2 Conversion.

Abstract

An easy and versatile method for the preparation of molecular alkoxysilanols as molecular organosilicates based on acetoxysilylalkoxides (ASA, $(RO)(t\text{BuO})_nSi(OAc)_{3-n}$ or $(AcO)_{3-n}(t\text{BuO})_nSi\text{-}O\text{-}R\text{-}O\text{-}Si(Ot\text{Bu})_n(OAc)_{3-n}$, R = organic group; n = 0 or 1) is presented. These ASA precursors are prepared from silicon tetraacetate and suitable alcohols and are cleanly hydrolyzed in water to the corresponding alkoxysilanols in the absence of a base or organic solvents. The compounds were characterized by common spectroscopic methods including X-Ray structural analysis. Alkoxysilanols were tested in the catalytic conversion of CO_2 to styrene carbonate and show quantitative conversion within 15 hours at 60 ^oC and 1 atm of CO_2.