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

Chemistry

Design and Characterization of Amino and Chloro Functionalized Rhombohedral Silsesquioxanes

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**Abstract:** A more rapid and a versatile synthetic approach for the preparation of polyhedral silsesquioxanes (POSS) by hydrolytic condensation of organosilicon monomers in the presence of a Pt catalyst was studied. The structural properties of POSS molecules were determined by X-ray powder diffraction analysis, yielding a rhombohedral unit cell with  $a = 11,52796\text{Å}$  and  $\alpha = 94,9754^\circ$  for octaaminopropyl-POSS, and a rhombohedral unit cell with  $a = 11,51421\text{Å}$ ,  $\alpha = 96,7214^\circ$  for octachloropropyl-POSS. The activation energies were found to be 64.8, and 89.1 kJ/mol for octaaminopropyl-POSS and octachloropropyl-POSS, respectively. The products were also characterized by Fourier transform infrared spectroscopy,  $^1\text{H}$  and  $^{13}\text{C}$  nuclear magnetic resonance, differential thermal analysis, and thermogravimetric analysis.

**Key Words:** Ceramics, Sol-gel; POSS, activation energy, Kissinger Equation

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