



演題: [RSiO_{1.5}]_{8/10/12} 3-D NANOBUILDING BLOCKS (NBS) FOR STRUCTURAL, PHOTONIC AND ELECTRONIC APPLICATIONS

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要旨: The title compounds offer very high symmetry, with diameters of 1-1.5 nm and with 8, 10 or 12 vertices arrayed in 3-D. They can be synthesized using mix and match assembly as shown in the following reaction.



The R groups can be varied infinitely depending on desired functionality, targeted assembly mechanism and target global properties. Thus structures ranging from relatively linear polymers to 3-D networks are accessible. These materials are typically very soluble and thus easy to modify, purify and characterize. They offer very high thermal stabilities compared to all carbon analogs because of the intrinsic heat capacity of the silica cores offering potential for space applications. Tailoring allows control of properties including densities, coefficients of thermal expansion, porosity for gas storage as well as for insulation. They also exhibit very novel photophysical properties including unusual two photon absorption cross-sections.

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