

Synthesis and Characteristics of Sol-Gel Inorganic-Organic Hybrid Materials(HYBRIMER)

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The characteristics of the sol-gel process allow the introduction of 'fragile' organic molecules inside an inorganic network. Inorganic and organic components can be mixed at the molecular scale, leading to the formation of the so-called inorganic-organic hybrid materials (HYBRIMER). The HYBRIMERS are extremely versatile in their composition, processing, and characteristics. In the siloxane based HYBRIMER synthesized by sol-gel process of organoalkoxysilanes, network modifiers organic functionalities can be used to target many other specific properties. Molecular design of HYBRIMER of inorganic and organic species gives the improved characteristics tunable between glasses and polymers. Also, the process of the HYBRIMER is very flexible and versatile, making easy and cheap fabrication of devices. Recently, the siloxane based HYBRIMERS have been fabricated by simple chemical reactions of silicon salts, organosilanediosl, and organoalkoxysilanes without adding water. This non-hydrolytic processed HYBRIMERS are solventless resin type materials that can solve the problems of common sol-gel processed HYBRIMERS. Thus, the HYBRIMER will be very potential materials for application of optical waveguides and dielectrics of displays.