

Synthesis of Nano-silver Containing Silica Glass by Sol-gel

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Silicate glasses containing silver nano clusters have attracted considerable interest for their potential application as antibacterial materials, non-linear optical devices, electro-optic devices and catalyst. Silver containing silica glass film and powder are formed by the sol-gel process, using $\text{Si}(\text{OC}_2\text{H}_5)_4$, $\text{C}_2\text{H}_5\text{OH}$, H_2O , HNO_3 and AgNO_3 precursors. The glassy, highly transparent films are successfully prepared by the dip coating and spin coating methods. Optical measurement and physical/chemical characterization on the films are made by UV-VIS spectroscopy, X-ray photoelectron spectroscopy, and Transmission Electron Microscopy. Mechanisms of silver colloid formation with respect to the thermal treatment are discussed.