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**The XPS Characteristics for Luminescent Silica (SiO<sub>2</sub>) Systems**

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The aim of this study is to determine changes in chemical state and structure of the blue emission SiO<sub>2</sub> nano spheres and thick films caused by annealing conditions for the better understanding of origin for the luminescent properties. The series of monodispersed silica systems were synthesized in a procedure similar to that of A. M. Jakob et al. and spinning. The silica systems were annealed in a tube furnace at T = 200-700°C for 2-50 hr with different atmosphere ( air, argon, nitrogen, hydrogen and argon+hydrogen mixed gas). The X-ray photoelectron spectroscopy was used to verify the functional groups present on the surface of blue emission SiO<sub>2</sub> nano spheres at different annealing conditions. Fluorescence spectra of SiO<sub>2</sub> samples recorded and displayed different emission maxima depending on the annealing temperature, holding time, and annealing atmosphere. Silica systems annealed at 400 and 500°C in air atmosphere for 2 hours display maximum fluorescence at room temperature. The change of crystal and microstructures were characterized by TEM and XRD.

**Key Words:** Luminescent, Silica, X-ray Photoelectron Spectroscopy