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Synthesis and optical properties of silver nanoparticles in ORMOCER

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Abstract

Experimental results on synthesis of metal nanoparticles in ORMOCER by ion implantation are presented. Silver ions were implanted into organic/inorganic matrix at an accelerating energy of 30 keV and doses in the range of 0.25·10 17 to 0.75·10 17ion/cm 2. The silver ions form metal nanoparticles, which demonstrate surface plasmon absorption at the wavelength of 425-580 nm. The nonlinear absorption of new composite materials is measured by Z-scan technique using 150 fs laser pulses at 780 nm wavelength. ORMOCER matrix shows two-photon nonlinear absorption, whereas ORMOCER with silver nanoparticles demonstrates saturated absorption. Some optical applications of these composite materials are discussed. © Springer-Verlag 2012.

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