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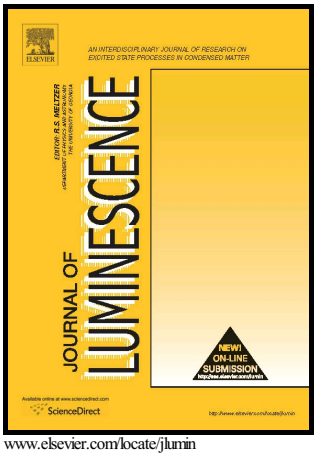

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Optical limiting property of gold nanorods/silicone hybrid materials to tunable laser

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Abstract

Optical limiting (OL) materials have attracted much attention for the increasing demand in laser protection field. Remarkably, gold nanorods (GNRs) can be employed as potential optical limiting material against tunable laser. In this work, three kinds of GNRs with different aspect ratios were prepared and doped into silicone prepolymers to obtain gold nanorods/silicone hybrid rubber materials. The hybrid materials were found to have certain OL property to femtosecond laser whose wavelength was near the longitudinal surface plasmon resonance (SPR) absorption peak. The OL effect was related with the SPR absorption strength, i.e., samples doped with more GNRs showed better OL performance. The OL property of the GNRs/silicone rubber samples to laser at other wavelengths was also pretty good only if the samples had enough absorption strength at that wavelength.

Keywords: Gold nanorods, Silicone rubber, optical limiting, tunable laser.

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