

Er³⁺ loaded barium molybdate nanoparticles: IR to visible spectral upconversion

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Materials Letters. Vol. 142, 7-10

DOI: 10.1016/j.matlet.2014.11.109

Abstract

In this study, we report the infrared to visible upconversion luminescence behavior of Er³⁺ loaded barium molybdate nanoparticles synthesized by microwave induced sol-gel route. Structural and morphological properties were analyzed and the upconversion response of the Er³⁺ loaded samples (1 mol% and 5 mol%) was investigated by exciting the samples at 980 nm from a Continuous Wave Laser Diode (CWLD). Results showed that the green emissions around 528 and 546 and red emissions at 658 nm were observed, respectively, and the intensity of both emissions were found to be enhanced with increase in concentration from 1 mol% to 5 mol% of Er³⁺ ions. Upconversion mechanism is discussed and this study gives the way to convert infrared energy to visible light in other molybdate scheelite structures.