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Unexpected water screening in gel-encapsulated terbium systems

TETYANA IGNATOVA, Lehigh University, JUAN G. DUQUE, STEPHEN K. DOORN, Los Alamos National Laboratory, SLAVA V. ROTKIN, Lehigh University — Terbium (Tb) salts and their compounds are used as bio-labels and dyes due to their unique photoluminescence (PL) properties. Our study focuses on PL of Tb ions in crowded surroundings, mimic to living cells. Silica gel with SWNT dispersed with sodium deoxycholate (DOC), silica gel only, and DOC water solution were chosen as prototypes for bio-environment. Time resolved and steady state spectroscopy was used to monitor the behavior of terbium in different enclosing. We observed significant increase of PL lifetime in the gel in comparison with aqua solution, which indicates the reduction of OH groups in the co-ordination shell of the Tb ion. PL spectra of Tb in water and in DOC micelles and gels confirmed structural changes during encapsulation process.

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