

Iodine molecules fluorescence in nanostructured photonic crystal

O.O. Perederiv, A.M. Negriyko

Laser Spectroscopy Department, Institute of Physics, Natl. Acad. of Sci. of Ukraine. Prospect Nauki, 46, Kiev-03039, Ukraine.

E-mail: negriyko@iop.kiev.ua

The secondary emission (fluorescence, Raman, spontaneous parametric light scattering) of nanocomposites based on 3D photon crystals (e.g. synthetic opals) filled by light emitting media (atoms or molecular vapors, dyes or fluorophores) is a subject of intensive study [1-3]. The light excited by external sources in material with a periodic modulation of the dielectric constant can be used for the demonstration of the influence of photonic crystal properties onto the propagation and confinement of photons.

We have used the iodine molecules excited by resonance laser radiation as sources of fluorescence light spanning the wide region of visible spectrum, including the photonic band gap. The iodine fluorescence light with its narrow lines spectrum is convenient for study both photonic gap and localization of molecular motion in nanosized pores influence onto the photons propagation in opal [4].

The estimations of iodine spectra modifications due to the iodine molecules confinement in opal nanopores and photon band gap influence are presented and compared with experimental study of iodine molecules fluorescence spectra.

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