ADVANCED LIGHT EMISSIVE DEVICE STRUCTURES

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In the present paper we discuss preparation and properties of the GaP nanoparticles and light emissive films on the base of some GaP/polymer nanocomposites. This work has been fulfilled in framework of the joint USA/Moldova, Italy, Romania STCU (www.stcu.int) 4610 Project "Advanced Light Emissive Device Structures", 2009-2012, sponsored by the US Department of States, and continues our efforts with the focus being to advance the quality and light emissive properties of GaP nanocomposites and using our new results in preparation of closed to ideal bulk GaP single crystals, different methods of GaP nanoparticles syntheses and the most optically and mechanically compatible polymers.

The main results of the next 5 stages described in the relevant technical reports, have been presented at prestigious international conferences, published in the conference proceedings, InTech open access book, Journals of Electronic Materials and Nanoparticle Research [1-12]: 1) Development of technology for growth of pure and doped GaP nanocrystals; 2) Comparison of the properties of nanocrystals and bulk single crystals; 3) Development of methods of incorporation of the GaP nanoparticles into polymers; 4) Fabrication and characterization of nanocomposite polymer light emissive device structures and 5) Comparison of the obtained and anticipated results. Generalization and dissemination of the results.

PGMA, PGMA-co-POEGMA, BPVE and THF polymers were used for preparation of GaP nanocomposites suitable for light emissive luminescent device structures. These nanocomposites provide significant enhancement of blue-shifted luminescence from which novel light emissive device structures may be fashioned.

As the result, on the base of the improved technologies for preparation of GaP nanoparticles and GaP/polymer nanocomposites we can change within the broad limits the main parameters of luminescence and expect to create a framework for novel light emissive device structures using dramatic 1 eV expansion of GaP luminescence to UV region. This activity will be prolonged in the next joint projects and in edited by us new InTech open access book "Optoelectronics 2".

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