

## Photoluminescence of Single CdS :Mn Nanocrystals Fabricated by Sequential Ion Implantation

NAIST<sup>A</sup>, Kyoto Univ.<sup>B</sup>, Keio Univ.<sup>C</sup>, Oak Ridge National Lab.<sup>D</sup>  
A. Ishizumi<sup>A</sup>, K. Matsuda<sup>B</sup>, T. Saiki<sup>C</sup>, Y. Kanemitsu<sup>A,B</sup>, C. W. White<sup>D</sup>

Much interest has been focused on the fabrication and optical properties of semiconductor nanocrystals doped with luminescence centers. Recently, we have demonstrated that the Mn-related photoluminescence (PL) is observed in the Mn-doped CdS (CdS :Mn) nanocrystals fabricated by sequential ion implantation [1]. Our spectroscopic data show that ion-implantation is one of the useful methods for the fabrication of semiconductor nanocrystals doped with functional impurities [2].

In this work, we have studied the photoluminescence properties of individual CdS :Mn nanocrystals by means of a scanning near-field microscope. In the spatially resolved PL spectra of CdS :Mn nanocrystals, several sharp PL lines and a broad PL band were observed. The sharp PL lines are assigned to the excitons and/or carriers localized at the shallow impurities [3]. We find that the intra-3d transition of Mn<sup>2+</sup> ions causes the broad PL spectrum even in single nanocrystals. The PL properties of single CdS :Mn nanocrystals will be discussed.

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