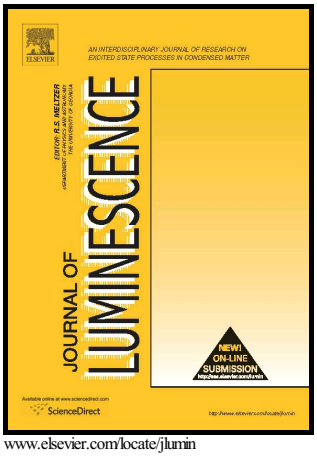

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PII: S0022-2313(18)30694-X
DOI: https://doi.org/10.1016/j.jlumin.2018.07.029
Reference: LUMIN15776

To appear in: *Journal of Luminescence*

Received date: 19 April 2018
Revised date: 4 June 2018
Accepted date: 20 July 2018

Cite this article as: Yanbo Xing, Xi Yuan, Sihang Ji, Michio Ikezawa, Ruosheng Zeng, Haibo Li, Yasuaki Masumoto and Jialong Zhao, Temperature-Dependent Photoluminescence of Mn Doped $CsPbCl_3$ Perovskite Nanocrystals in Mesoporous Silica, *Journal of Luminescence,* https://doi.org/10.1016/j.jlumin.2018.07.029

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ABSTRACT

Highly luminescent Mn doped perovskite nanocrystals (NCs) are promising in solid state lighting. The thermal stability of Mn^{2+} luminescence in Mn:$CsPbCl_3$ NC/mesoporous silica (MPS) composites was studied at temperature ranging from 80 K to 450 K by steady-state and time-resolved photoluminescence (PL) spectroscopy. The Mn:$CsPbCl_3$ NCs with various Mn doping concentrations were synthesized by changing the Mn/Pb molar ratios at 190 ºC. It was found that the Mn doped NC films showed a more significant decrease in PL intensities and lifetimes at high temperature above 320 K than the Mn doped NC/MPS films, indicating that the Mn^{2+} luminescence in doped NC/MPS films exhibited better thermal stability than that of NC films. Further the broadening and shifts of Mn^{2+} emission bands in doped NC and NC/MPS films were observed at elevated temperature. The temperature-dependent linewidths of Mn^{2+} emission bands were discussed by electron-phonon coupling.