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Photoluminescence anti-blinking of single CdZnSe/ZnSe nanocrystals XIAOYONG WANG, Department of Chemistry, University of Rochester, XIAOFAN REN, KEITH KAHEN, Eastman Kodak Company, MEGAN HAHN, Department of Chemistry, University of Rochester, MANJU RAJESWARAN, Eastman Kodak Company, SARA MACCAGNANO-ZACHER, JOHN SILCOX, School of Applied and Engineering Physics, Cornell University, GEORGE CRAGG, ALEXANDER EFROS, Naval Research Laboratory, TODD KRAUSS, Department of Chemistry, University of Rochester, UNIVERSITY OF ROCHESTER TEAM, EASTMAN KODAK COMPANY COLLABORATION, CORNELL UNIVERSITY COLLABORATION, NAVAL RESEARCH LABORATORY COLLABORATION — We have synthesized soft-confinement nanocrystals (NCs) of CdZnSe/ZnSe that on the single particle level exhibit complete elimination of photoluminescence (PL) blinking. These continuously emitting NCs have a very short PL decay lifetime of 5 ns. Moreover, single CdZnSe/ZnSe PL spectra are highly unusual with three distinct peaks. These unique and remarkable optical properties are collectively explained by the radiative recombination of a trion due to suppressed Auger processes in a NC. Upon deformation of the soft-confinement potential, the PL intensity of a single CdZnSe/ZnSe NC switches between two bright states, but still never turns off. Possible mechanisms for this PL anti-blinking behavior will be discussed.

Xiaoyong Wang
Department of Chemistry, University of Rochester

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