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Auger Rate Quenching in Nanocrystals GEORGE E. CRAGG, Naval Research Laboratory, Washington, DC 20375, XIAOYONG WANG, MEGAN A. HAHN, Department of Chemistry, University of Rochester, Rochester, NY 14627, SARA MACCAGNANO-ZACHER, JOHN SILCOX, School of Applied and Engineering Physics, Cornell University, Ithaca, NY 14583, TODD D. KRAUSS, Department of Chemistry, University of Rochester, Rochester, NY 14627, ALEXANDER L. EFROS, Naval Research Laboratory, Washington, DC 20375 — Single nanocrystal (NC) photoluminescence (PL) blinking is believed to arise from a photoionization event, resulting in a charged NC state made dark by the dominance of the non-radiative Auger rate. Suppression of the Auger rate has been suggested as the underlying mechanism for the non-blinking PL observed in soft-confinement, single CdZnSe/ZnSe NCs. To probe the interplay between the confinement geometry and the PL, we employ a coupled, two-band NC model which is analyzed with numerical routines based on the propagation matrix formalism. The results obtained will verify whether smooth confining potentials mitigate the Auger process, thereby eliminating blinking by allowing NCs to photoluminesce even in their charged state.

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