

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Dielectric confinement effects on the emission lineshape of single semiconductor nanocrystals DANIEL GOMEZ, JOEL VAN EMBDEN, PAUL MULVANEY, The University of Melbourne — We have explored the influence of different matrices on the photoluminescence line shape of individual CdSe core shell nanocrystals (NCs) at room temperature using confocal microscopy / spectroscopy. The results obtained corroborate previous observations of a correlation between blinking events and spectral diffusion but in addition, we have found that the extent of spectral diffusion is almost independent of the dielectric environment of the NC, thus suggesting that ionization and charge reorganization events in the matrix are not responsible for the observed continuous spectral shifts. We also observed that the emission line width is correlated with the emission peak position and that the correlation coefficient between these two variables is a function of the dielectric constant of the matrix surrounding the NC. These results are analyzed in terms of dynamic rearrangements of charges trapped at the surface of the nanocrystal.

Daniel Gomez
The University of Melbourne

Date submitted: 22 Nov 2005

Electronic form version 1.4