Abstract Submitted
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Synthesis of monodisperse nanocrystals via green chemistry WILLIAM YU, VICKI COLVIN, Rice University — Novel strategy for the synthesis of monodisperse nanocrystals was developed. This new method is cheap, reliable, safe and environmentally benign. The nanocrystals synthesized by this new method, including semiconductor nanocrystals (quantum dots) CdS.....[1], CdSe, CdTe.....[2], PbSe.....[3], and magnetic nanocrystals, Fe_3O_4.()[4] (magnetite), have wider size range, and narrower size distribution (less than 10%). Through this new method, one can control the size, shape, and crystal structure of the aimed nanocrystals by simply changing the ligands used in the synthesis. With the high quality nanocrystals, some basic physical constants, such as extinction coefficients of semiconductor nanocrystals were accurately measured.....[5]. A simple method was also developed to transfer the above-mentioned organic-media synthesized high quality nanocrystals to aqueous media (pure or buffered water). The water-soluble nanocrystals keep their original properties in organic media. For example, water-soluble semiconductor nanocrystals have the same absorption and emission spectra, the same quantum yield, and the same size and size distribution as the ones dispersed in chloroform. The water-soluble nanocrystals are stable in pure water and conventional biological buffers. .[1]W. W. Yu and X. Peng, *Angew. Chem. Int. Ed.*, **41**, 2368 (2002). [2]W. W. Yu, Y. A. Wang and X. Peng, *Chem. Mater.*, **15**, 4300 (2003). [3]W. W. Yu, J. C. Falkner, B. S. Shih and V. L. Colvin, *Chem. Mater.*, **16**, 3318 (2004). [4]W. W. Yu, J. C. Falkner, C. Yovuz and V. L. Colvin, *Chem. Commun*, 2306 (2004). [5]W. W. Yu, L. Qu, W. Guo and X. Peng, *Chem. Mater.*, **15**, 2854 (2003).

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