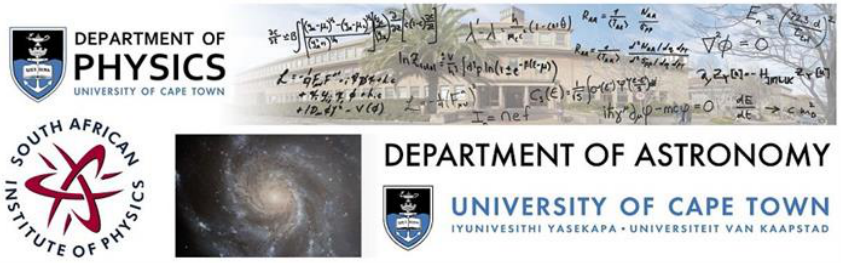

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Effect of refluxing growth time on structural, optical and luminescence properties of zinc telluride Quantum dots

Tuesday, 5 July 2016 16:10 (1h 50m)

Abstract content
   (Max 300 words)
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Keywords: zinc telluride; quantum dots; bioimaging; photoluminescence; particle size.

This paper presents the synthesis of L-cysteine capped zinc telluride quantum dots (ZnTe QDs) by a simple one-pot synthesis using zinc acetate, potassium tellurite and L-cysteine as the starting materials. The reaction was carried out in a single three necked flask in open air conditions under reflux at 100deg;C. Photoluminescence (PL) measurements show sharp emission peaks for all as-prepared ZnTe QDs. The PL spectra indicate a shift in emission window of the core which is accompanied by an increase in emission intensity for longer refluxing growth time. Highest intensity was observed at 30 minutes of synthesis. X-ray diffraction spectra show the formation of a hexagonal structure for all samples. Difference in absorption edges were observed due to a variation of refluxing growth time of ZnTe QDs. The position of the absorption band is observed to shift towards longer wavelengths for longer durations of synthesis. The band gap shows an inverse relation with the growth time of the as prepared ZnTe QDs. Spherical shaped QDs were formed as displayed by the HRTEM images. Owing to the flexible surface characteristics of QDs, the same surface functionalization approach can be used to conjugate QDs of any color [1-2].

Reference:
[1] M. Bruchez, Jr., M. Moronne, P. Gin, S. Weiss, A. P. Alivisatos, Science 1998,81, 2013.
[2]X. Gao, Y. Cui, R. M. Levenson, L. W. K. Chung, S. Nie, Nat. Biotech.2004, 22, 969.

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F B Dejene
dejenebf@ufs.ac.za
University of the Free State

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Primary author: Ms KIPROTICH, Sharon (University of the Free State)

Co-author: Prof. DEJENE, Francis B (University of the Free State)

Presenter: Ms KIPROTICH, Sharon (University of the Free State)

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