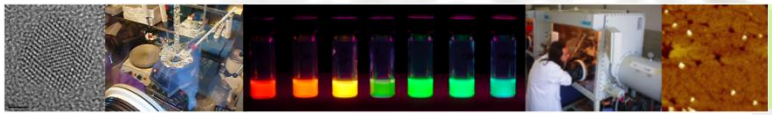
UNIVERSITEIT GENT

Physics and chemistry of nanostructures

Kick-off phone call Navolchi project

November 2011



Physics and Chemistry of Nanostructures Group

FCN

http://www.nano.UGent.be

PCN

Inorganic and physical chemistry department
Krijgslaan 281—S3

Prof. Z. Hens

2 Postdocs, 10 PhD students

Part of

Center for Nano- and Biophotonics

Research activities

A research group on (colloidal) nanomaterials

- **Synthesis development**
  - II-VI, IV-VI, Pb- and Cd-free quantum dots
- **Structural characterization**
  - Elemental analysis / HR-TEM imaging / NMR spectroscopy
- **Development of processing technology**
  - Ligand engineering / monolayers and thin films / surface patterning / embedding in thin films / QD based devices
- **Characterization of physical properties**
  - QD absorption / photoluminescence (steady state, excitation, time-resolved) / non-linear properties (Kerr-effect, photo-induced absorption, gain)
- **Application development**
  - Integrated photonics / photovoltaics / white LEDs

Role within Navolchi

Contributes to WP4

- Providing input to calculations (task 4.1)
- Synthesis and characterization of QDs for gain applications (task 4.3)
- Study of gain in colloidal QDs (task 4.4)
- QDs for photodetectors?

Manpower for Navolchi

- 24 Researcher Months (started November 2011)

Output relevant to Navolchi

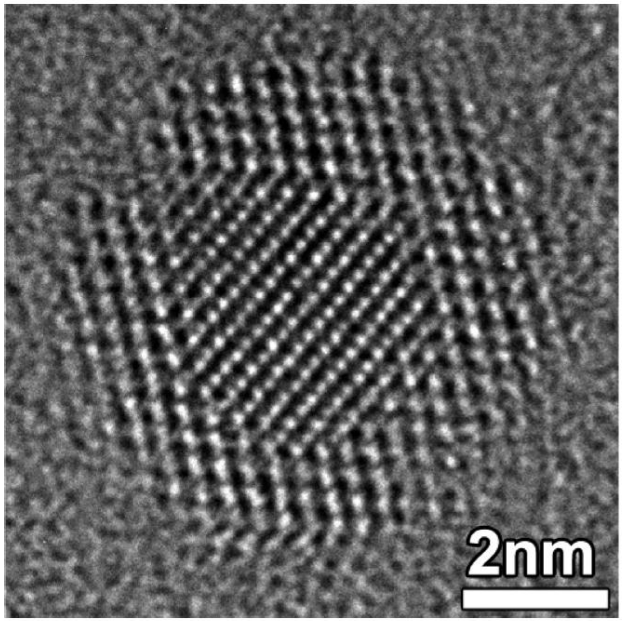
CHEMISTRY OF MATERIALS

Communication

PbTe|CdTe Core|Shell Particles by Cation Exchange, a HR-TEM study

Karel Lambert, Bram De Geyter, Iwan Moreels, and Zeger Hens

Chem. Mater., **2009**, 21 (5), 778-780• DOI: 10.1021/cm8029399 • Publication Date (Web): 17 February 2009

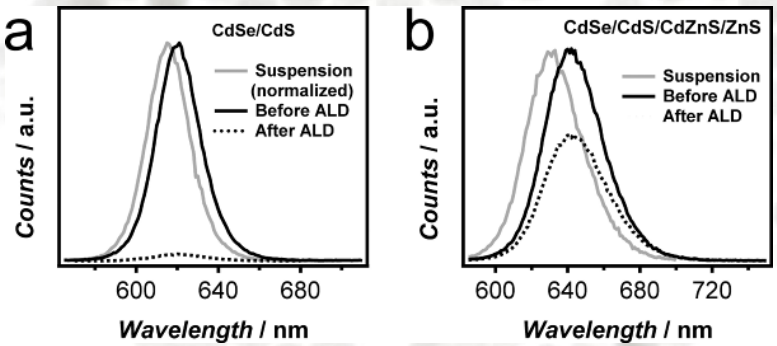


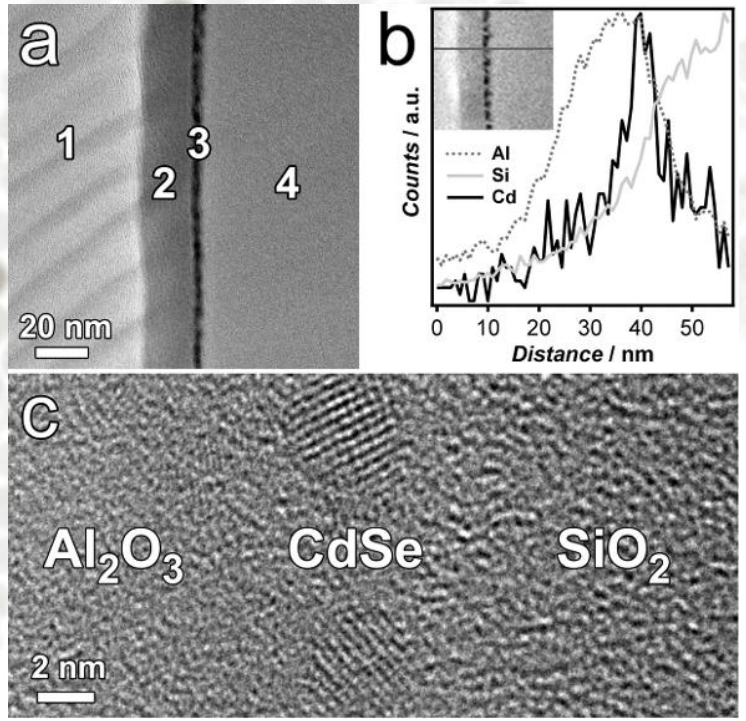
Output relevant to Navolchi

126 *Chem. Mater.* **2011,** *23,* 126–128
DOI:10.1021/cm1027354
CHEMISTRY OF MATERIALS
Communication

Embedding Quantum Dot Monolayers in Al_2O_3 Using Atomic Layer Deposition

Karel Lambert,† Jolien Dendooven,‡
Christophe Detavernier,‡ and Zeger Hens*,†





Output relevant to Navolchi

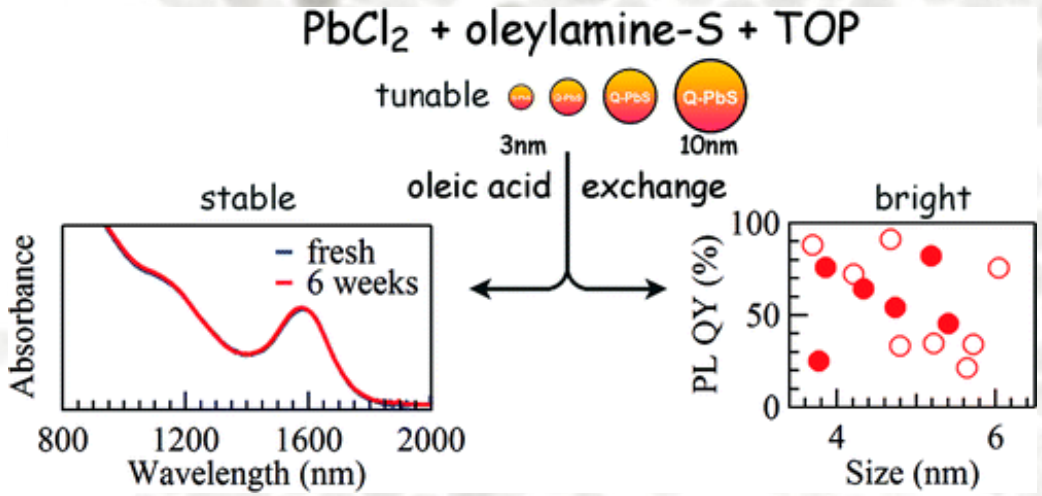
Size-Tunable, Bright, and Stable PbS Quantum Dots: A Surface Chemistry Study

Iwan Moreels,[†,*] Yolanda Justo,[†] Bram De Geyter,[†] Katrien Haustraete,[‡] José C. Martins,[‡] and Zeger Hens[†,*]

[†]Physics and Chemistry of Nanostructures, Ghent University, Krijgslaan 281-S3, BE-9000 Gent, Belgium, and [‡]NMR and Structure Analysis Unit, Ghent University, Krijgslaan 281-S4bis, BE-9000 Gent, Belgium

ARTICLE

ACSNANO www.acsnano.org



Plans up to February 2012

Development of alternate QDs – avoiding the Auger bottleneck to gain

- **PbX/CdX heterostructures**