Electronic Supplementary Material (ESI) for New Journal of Chemistry:

ZnS Anisotropic Nanocrystals by One Pot Low Temperature Synthesis

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Materials

Thioacetamide (TAA, Sigma-Aldrich, 99%), zinc nitrate hexahydrate (Riedel-de Haën, 98%), octylamine (OCA, Sigma-Aldrich, 99%), oleylamine (OLA, Acros Organics C18-content 80-90%), chloroform (VWR Chemicals, 99%), ethanol (VWR Chemicals, 99%), n-hexane (VWR Chemicals, 99%) are purchased for the synthesis of the nanoplatelets and used without any further purification.

Materials Characterization

Optical absorption and photoluminescence spectroscopy are performed using respectively an UV visible spectrometer (Varian Cary 5E) and photoluminescence spectrometer (Jobin-Yvon Horiba, Fluoromax-3). Transmission electron microscopy (TEM) imaging is done using a JEOL 2010, while X-rays diffractograms are obtain from a Philips X'Pert system with a Cu Kα source.

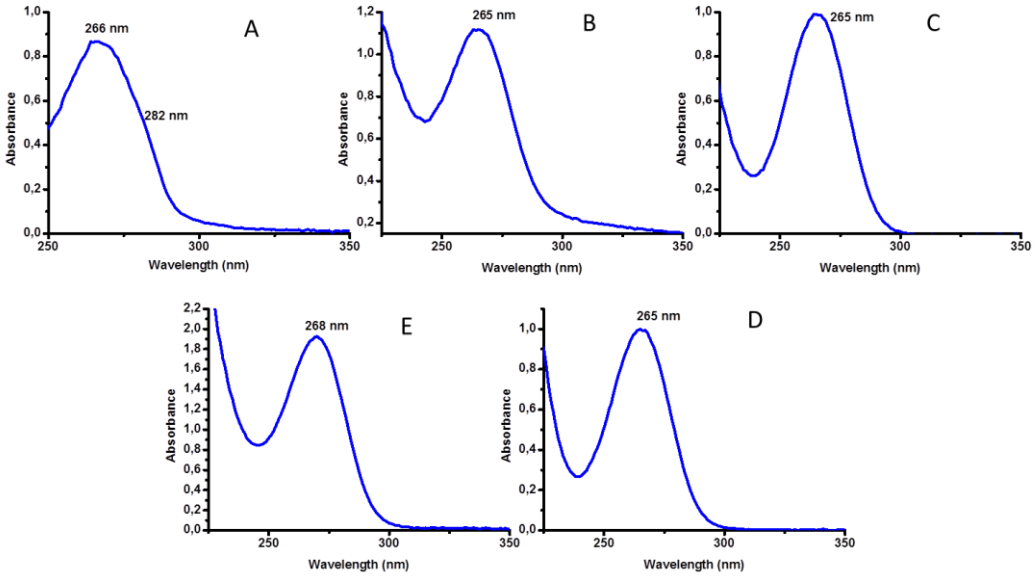

Figure S1. (1A) Absorbance spectrum of the crude solution obtained with route A, (1B) Supernatant of the synthesis done with route A, (1C) with route B (1D) with route C and (1E) absorbance spectrum of the mixture of thioacetamide and amines.

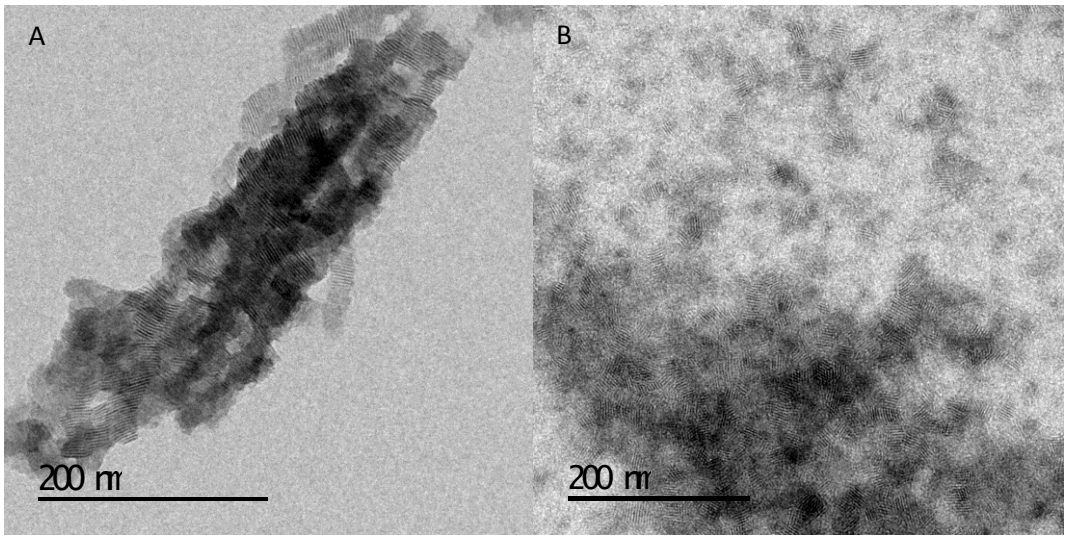

Figure S2. TEM images of agglomerates anisotropic nanocrystals. (2A) nanocrystals were synthetized by keeping the ratio octylamine/thioacetamide constant and vary the ratio thioacetamid/zinc comparing to route A. (2B) nanocrystals were synthetized by keeping the ratio thioacetamide/zinc constant and vary the ratio octylamine/thioacetamide comparing to route A.

Equation S1. Bragg's law used to determine the distance between each anisotropic nanocrystals. d^* is the distance between two plans (length of two ligands and the thickness of one NPL) and the source used is $\lambda_{Cuk\alpha}$ = 1,54 Å.

$$d^* = \frac{\lambda_{Cu_{K\alpha}}}{2sin\theta}$$

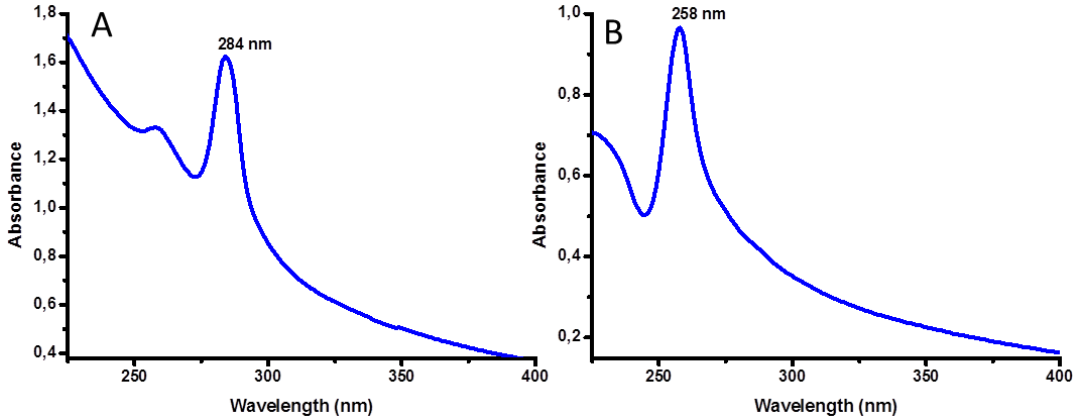

Figure S3. Absorbance spectrum of large scale synthesis of (A) nanowires and (B) nanoplatelets.

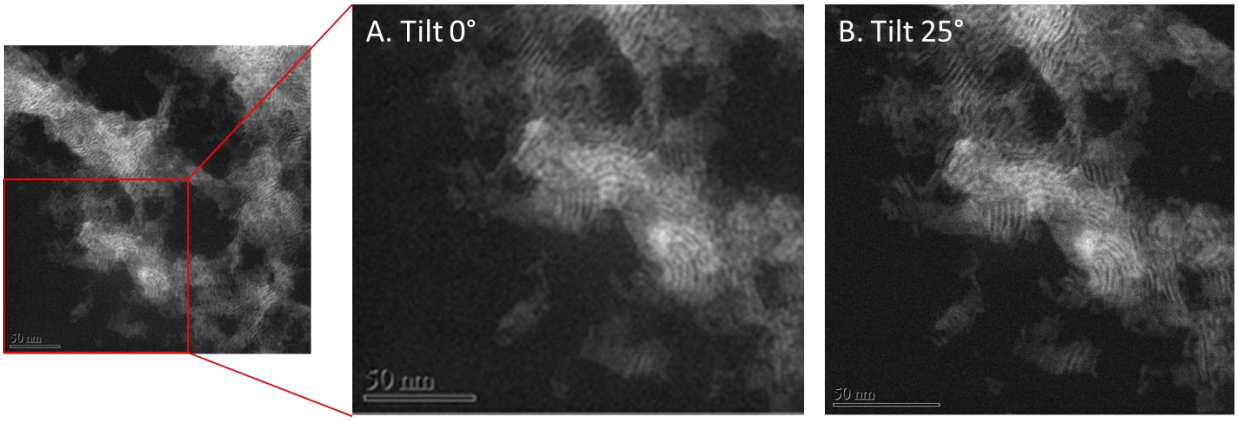

Figure S4. HAADF-TEM images of a sample obtained via route A with a tilt of (A) 0° and (B) 25°. We have calculated the projection of a nanoplatelet with a TEM grid tilt of 25° in order to be sure that we had obtained nanowires. If we had nanoplatelets, even with small dimensions such as 2.5 nm wide (length 10 nm and thickness 1.2 nm), a tilt of 25° would add ~1.2 nm to the NPLs projection when the grid is tilted by 25°. Such increase should easily be observed on the TEM image, which is not the case. We thus conclude a wire-like morphology of the nanocrystals.