

## Synthesis and Applications of Group 11-Based Ternary Chalcogenide Nanocrystals with Tunable Morphology and Composition

Albert Figuerola<sup>1,2</sup>, Mengxi Lin<sup>1,2</sup>, Mariona Dalmases<sup>1,2</sup>, Guillem Montaña<sup>1,2</sup>

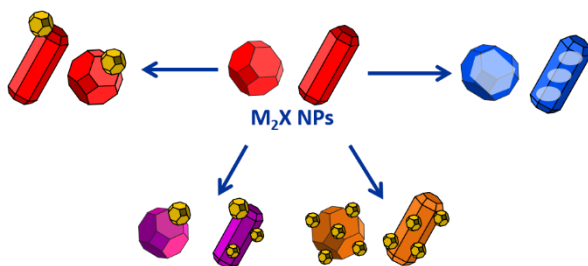
1 Departament de Química Inorgànica i Orgànica, Secció de Química Inorgànica and  
2 Institut de Nanociència i Nanotecnologia (IN2UB),  
c/ Martí i Franquès 1-11, 08028 Barcelona, Spain.  
[albert.figuerola@ub.edu](mailto:albert.figuerola@ub.edu)

The optimization of a material functionality requires both the rational design and precise engineering of its structural and chemical parameters. [1] Colloidal chemistry is an excellent synthetic choice for the synthesis of homogeneous and compositionally complex novel nanostructured systems with potential application in several fields. [2] We have exploited here several surfactant-assisted synthetic strategies in order to chemically transform our starting silver or copper chalcogenide nanocrystals into compositionally more complex nanostructured systems, such as hybrid and ternary I-I-VI semiconductor nanocrystals with different stoichiometries. Our results indicate the formation of new ternary materials, both with stoichiometric and non-stoichiometric compositions. Considering the complex chemical distribution of the species in the materials, the use of advanced atomic-resolution electron microscopy techniques was key for their appropriate characterization and elucidation of formation mechanisms. The work is complemented with the assessment of their potential as active materials for energy conversion devices and as contrast agents in clinical diagnosis.

### References

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### Figures



**Figure 1:** Chemical transformation of binary chalcogenide nanostructured materials into more complex noble metal-based chalcogenide systems with a ternary or hybrid composition. (M stands from Ag or Cu while X represents S or Se)