

FINAL MASTER PROJECT PROPOSAL



Title

Atomic Configuration Studies of Misfit-Layered Compounds in the form of Nanotubes

Supervisor(s)

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Summary of the project

The novel class of nanomaterials made from misfit-layered compounds (MLC) offers very interesting properties, especially related to collective electron excitations (charge density waves (CDW), superconductivity and Mott states) [1-4]. However, due to the complex, non-symmetric, structure of the misfit-layered compounds even down to the atomic scale, the analysis of these nanomaterials is a highly challenging task. Transmission electron microscopy (TEM) is a very appropriate approach for investigating the atomic structure and configuration of these nanomaterials [2-5]. Thus, during this Master Project the atomic structure and configuration as well as the optoelectronic properties of these new and unique 1D nanostructured MLC will be investigated. Further studies in the framework of a PhD thesis can be undertaken.

These works will be developed using advanced microscopy techniques and TEM instruments at the Instituto de Nanociencia de Aragon (INA).

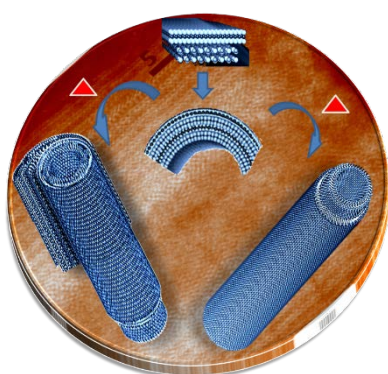


Figure: Schematic visualization of MLC and formation of NTs & nanoscrolls. [3].

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- [2] T. Ritschel et al, Nature physics 11, 328-331 (2015).
- [3] L. Panchakarla, L. Lajaunie, A. Ramasubramaniam, R. Arenal, R. Tenne, ACS Nano 10, 6248-6256 (2016).
- [4] L. Lajaunie, A. Ramasubramaniam, L. Panchakarla, R. Arenal, Appl. Phys. Lett. 113, 031102 (2018).
- [5] R. Arenal, X. Blase, A. Loiseau, Advances in Physics 59, 101 (2010).

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