INTERNATIONAL IBERIAN NANOTECHNOLOGY LABORATORY

Project Title:	*Synthesis and characterization of Nanocatalysts and 2D Nanosheets of Transition metal chalcogenides (TMDs)*
Project Short description	MoS_2/ WS_2 nanocatalysts as well as Co- Ni-doped MoS_2/WS_2 catalysts are employed for the removal of sulphur in petroleum and gasoline. The catalytic reactivity of the S–Mo–S layers is associated with their edges and detailed information about the edge structures is thus essential in order to understand the nature of the catalytically active sites. Hence understanding the atomic structure of these nanocatalysts as well as correlating their atomic structure with their catalytic activity are of great current interest. To achieve this objective, synthesis of pure as well as doped nanocatalysts are necessary to carry out further advanced electron microscopic studies. The synthesis will involve producing MoS_2, WS_2 nanocatalysts as well as doping them with Co/Ni which serve as promoters to enhance the activity of these nanocatalysts. The synthesis procedure that will be employed in the current project will involve high temperature solid state reactions. The samples will be screened using Scanning Electron Microscopy (SEM) to confirm the desired morphology as well as doping. Subsequently the methodology will be expanded to involve the synthesis of nanosheets of TMDs from the parent 2D nanomaterials by high temperature synthesis followed by liquid exfoliation. These nanosheets will be characterized by SEM.
Expected Start/end date	Starting Date: Jan 2015

INTERNATIONAL IBERIAN NANOTECHNOLOGY LABORATORY

Required degree and Background knowledge of students, minimum gradepoint average, etc…	Masters in Chemistry Candidates with a background in Inorganic/Organic Chemistry with a good track record are desired. Knowledge of synthesis of materials/nanomaterials will be valued. Basic knowledge of Scanning Electron Microscopy (SEM) will also be valued but is not compulsory.

Supervisor at INL

Name:	Leonard Deepak Francis
Position:	Staff Researcher
email:	leonard.francis@inl.int