

PRÉSENTATION DU PROJET DE STAGE M2

NOM, Prénom du porteur : M.B. Bouzouraa (LCP-A2MC) ; L. Broch (LCP-A2MC)

TITRE DU PROJET : **OPTICAL PROPERTIES OF ELECTROPLATED CHALCOGENIDE THIN FILMS**
DESCRIPTION DU PROJET (1 page maximum références comprises) :

The main part of the work will be devoted to the study of the optical properties of electroplated of SnS and SnSe films by infrared spectroscopic ellipsometry. The aim of this original approach is to study the electronic properties of the low dimensional materials using a contactless method. For this purpose, systematic studies will be carried out in a wide range of wavelengths, from visible to infrared. The analysis will be completed by surface characterisations (SEM, EDS, XRD, AFM) and electrical properties. The final goal of the project is to study the link between microstructure and transport properties of the semiconductor films.

Scientific context

This work falls firstly within the scope of the LCPA2MC laboratory, which has a strong and proven expertise in ellipsometry at the national level with a dedicated technological platform on the cutting edge. Moreover, the internship will be in collaboration the IJL laboratory for a large project in the field of renewable energy sources. The targeted application is to develop thermoelectric micro-devices from abundant and non-toxic compounds. For this objective, several teams of the IJL laboratory and a technical platform are engaged to synthesize films and to establish their thermoelectric performances.

The internship will be devoted to the characterization of SnS and SnSe obtained by electrodeposition. This material has to replace the bismuth telluride family, which currently has the best conversion performances. Bismuth and tellurium being considered as scarce elements, it appears necessary to find alternatives. The IV-VI materials including tin sulphides and selenide are thus interesting since they are more abundant and less toxic with transport properties adapted to thermoelectric conversion.

Profil recherché :

La candidate ou le candidat de Master 2 en chimie/physique (physique, optique, science des matériaux, chimie du solide, ...) devra posséder de bonnes connaissances en science des matériaux et des propriétés optiques des matériaux ainsi que de bonnes aptitudes au travail expérimental.

Contact : Plateforme Ellipsométrie

Laurent Broch ou Montassar Bouzouraa
Université de Lorraine - LCP-A2MC
Plateforme Ellipsométrie
1 bd Arago - BP 95823
F-57078 Metz Cedex 3

Mail : lcpa2mc-ellipsometrie-contact@univ-lorraine.fr

