

3<sup>rd</sup> International Conference on

# ELECTROCHEMISTRY

July 10-11, 2017 Berlin, Germany

## Electrochemical atomic layer deposition (EC-ALD) of semiconducting materials

**Marie-Christine Record**

Aix-Marseille University, France

Electrochemical deposition may provide an alternative process to physical deposition methods for preparing semiconducting thin films. Indeed by contrast to other methods, electrochemical deposition is a low cost, room temperature production technique, which works without vacuum atmosphere and allows one to cover substrates with complex shapes. The shortcoming of electrochemical deposition is limited control on the size, stoichiometry and crystallinity of deposits. The electrochemical atomic layer deposition (EC-ALD) method was put forward in 1991 by Gregory and Stickney. This method is based on the alternate under-potential deposition (UPD) of atomic layers of the elements to make up a compound, combining advantageously the technique of electrochemical deposition and that of atomic layer deposition (ALD). Under-potential deposition is a surface-limited electrochemical phenomenon, which makes the deposition generally limited to an atomic layer. In every cycle one monolayer of the compound is obtained, and the thickness of the deposit will only depend on the number of cycles. Each cycle consists in a series of individual steps, and each step can be optimized independently, resulting in well-controlled deposits. In the first part of this talk, the author will describe the EC-ALD method and he will expose the advantages of this method compared to those of physical ones of ALD type and compared to those of other electrochemical methods. Then, he will detail the EC-ALD experiment platform designed and constructed in our group. Finally, he will present some results they have got with this equipment for the electrodeposition of CoSb<sub>3</sub> and Sb<sub>2</sub>Se<sub>3</sub> compounds.

### Biography

Marie-Christine Record has completed her PhD in 1992 from Montpellier University (France) and Post-doctoral studies from Ecole Centrale Paris (France). She was an Associate Professor at Montpellier University from 1996 to 2004 and has been a Full Professor at the Aix-Marseille University (France) where she works on the elaboration of thin films materials for energy. She has published more than 80 papers in reputed journals and has been serving as an Editorial Board Member of repute.

m-c.record@univ-amu.fr

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