

Physics Seminar

Tuesday, 22nd November 2011 at 16h15
(coffee at 16h00)

Campus Belval
Room F011

Talk by **Dr. Elisabeth Chassaing**

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Challenges in electrodeposition for photovoltaic applications

Soft chemical processes, such as spin coating, sol-gel technique, chemical bath or electrochemical deposition are emerging as low-cost methods for the deposition of semiconducting films especially in the field of photovoltaics. In thin layer solar cells electrochemical deposition is now developed for the synthesis of the absorber, the buffer layer as well as the transparent conductive oxide layer.

A general view of the electrodeposition of semiconductors will be presented, focusing on chalcogenides (CdTe, Cu(In,Ga)(Se,S)₂, Cu₂ZnSn(S,Se)₄), sulfide (In_xS_y) and oxide (ZnO), which are under intense development for photovoltaic applications [1-4].

The basic interfacial mechanisms involved in the electrodeposition steps of semiconductors, which control the quality and structure of the layers will be recalled.

1 - L. Ribeaucourt, G. Savidand, D. Lincot, E. Chassaing, *Electrochemical Study of One-Step Electrodeposition of Copper-Indium-Gallium Alloys in Acidic Conditions as Precursor layers for Cu(In,Ga)Se₂ Thin Film Solar cells*, Electrochimica Acta, 56 (2011) 6628-6637

2 - C. Gougoud, S. Delbos, E. Chassaing, D. Lincot, *Co-électrodépôt de films de cuivre, zinc, étain pour applications photovoltaïques*, Journées d'électrochimie 2011, 4-8 juillet, Grenoble

3 - E. Chassaing, N. Naghavi, G. Rocha, V. Bockelee, E. Leite, M. Bouttemy, J. Vigneron, A. Etcheberry and D. Lincot, *Recent advances in electrodeposition of interfacial buffer layers in chalcopyrite-based solar cells*, ECS transactions, 2011, Processes at the semi-conductor solution interface 4, Vol 35, 127-134

4 - J. Rousset, E. Saucedo, K. Herz, *High efficiency CIGS-based solar cells with electrodeposited ZnO:Cl as transparent conducting oxide front contact*, Progress in Photovoltaics, 19 (2011) 537-546

Next Physics Seminars

- Tuesday, 13th December 2011
Belval, 16h15
Prof. Christian Wagner
The blistering of viscoelastic filaments and the formation of nano-fibers
- Thursday, 12th January 2012
Belval, tbc
Dr. Tobias Kraus
Particle films, clusters and supercrystals: the science and the process engineering of nanoparticle self-assembly