

Proposition de financement doctorale pour la rentrée 2018-2019

Titre de la thèse :

Réactivité chimique et électrochimique de Mg dans des électrolytes à forte teneur en ions (liquides ioniques miscibles à l'eau)

Directeur de thèse : Polina VOLOVITCH (polina.volovitch@chimie-paristech.fr)

Laboratoire d'accueil : IRCP – UMR 8247

Mg presents the best strength / weight combination among all metallic engineering materials, high electrochemical reactivity for battery applications, biodegradability, abundance, etc. making it a very interesting material for numerous applications. The formation of passivating surface films plays a crucial role for both, corrosion of Mg and Mg²⁺ dissolution during battery discharge. Till now, the reactivity of Mg was extensively studied in traditional diluted solutions. The works in concentrated electrolytes, in particular relevant to batteries, were mainly performed through trial and error tests without going deeply into the understanding of the reaction mechanisms. The aim of this project is to determine factors controlling the reactivity of promising Mg-alloys in aqueous electrolytes with high ionic strength and in mixed inorganic-organic electrolytes relevant to batteries. The interface will be studied by means of a unique combination of the electrochemistry in situ surface analysis by Confocal Raman Microscopy and ex situ surface analysis (XPS, GD-OES, SEM-FEG).

Mots clés : Mg, electrochemistry, in-situ Raman spectroscopy, ionic liquids