

## Doctoral position

### Description of the position

The position consists of a 4-year PhD position.

Starting position is for one year with option to continue after evaluation.

Candidates should have a master diploma in materials science or chemistry.

Candidates should provide reference persons, willing to be contacted.

Candidates should have a background on materials science, electrochemistry and corrosion science. Candidates should indicate experience with modelling.

### Research topic: The influence of water and salts on the electrochemical behavior of buried interfaces on organic coated steel

Organic coatings are very often employed to protect steel structures from corrosion in atmospheric circumstances. Indeed, the ingress of water and salts through the coating from the surroundings has a detrimental effect on the integrity of the steel parts.

In this PhD work, the influence of these products on the interfacial electrochemistry will be researched. Therefore, state-of-the-art combinations of analytical techniques must be deployed. In order to be able to in-situ investigate the influence of aqueous solutions, FTIR in a Kretschmann geometry, combined with electrochemical impedance spectroscopy is a key tool. Furthermore, Ambient Pressure XPS will complement the insights gained by the latter technique to unravel the chemical changes on the interface using technical metallic substrates. Combinations of other relevant techniques will be researched and developed.

The PhD ambitions to unravel the electrochemical phenomena at hybrid interfaces on a molecular level. Methodologies to understand these interactions in relevant conditions need to be set up, in order to identify the crucial parameters in atmospheric hybrid structure failure.

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