



Institute for Radical Chemistry
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PhD position in Physical /Analytical Mass Spectrometry DESI-MS/MS of digital polymers

About the position

A fully funded PhD studentship is available in the research group of Pr Laurence Charles at Aix Marseille University in Marseille (France) to develop analytical methodologies aimed at decoding digital information written in the backbone of sequence-defined synthetic polymers.^[1] The structure of such uniform macromolecules is specifically designed to use tandem mass spectrometry (MS/MS) as an efficient sequencing methodology.^[2] In order to achieve massive information storage, an appealing alternative to the synthesis of very long chains is to arrange coded polymers on surfaces. In this context, an ionization technique with surface sampling capabilities and MS/MS coupling is required. As recently tested for small oligomers,^[3] desorption electrospray ionization (DESI) offers promising perspectives. Yet, further development and optimization are requested for fast readout of long digital polymers organized on surfaces.

This PhD project aims at investigating how experimental parameters, amongst which surface properties, influence DESI of different coded polymers in terms of yield and charge state distribution, two key issues for their *de novo* sequencing. The candidate will closely collaborate with chemists in charge of polymer synthesis in the group of Dr Jean-François Lutz at the Institut Charles Sadron in Strasbourg (France).

^[1] Nature Chemistry 2014, 6, 455. ^[2] Nature Communications 2017, 8, 967. ^[3] Advanced Materials Technologies 2021, 6, 2001088.

Profile

A strong background in physical chemistry is mandatory. Good understanding of fundamental mass spectrometry (ionization as well as ion dissociation) is required and any prior experience in the field would be appreciated. Evidences of excellent English writing and communication skills, as well as motivation to work on scientifically challenging topics should be provided.

Application

Candidates are invited to submit an up-to-date CV, marks of Master degree, a cover letter and the contact details of at least two references to PR Laurence Charles (laurence.charles@univ-amu.fr).