

ESR 3 position

Project title: Gas Phase study of encapsulation processes

Location: Freie Universität Berlin, Germany

Supervisor: Prof. Christoph Schalley

Objectives of the individual project:

- 1) Gain expertise in modern mass spectrometric methods and gas-phase chemistry of noncovalent complexes (e.g. ionization and fragmentation methods, ion mobility MS etc.)
- 2) Learn about the types of non-covalent bonding depending on the environment under which they form (e.g. gas phase vs. solution).
- 3) Synthesis of capsules and cages based on calix[4]arene scaffolds as well as self-assembly (Academic Secondment).
- 4) Thermodynamic and kinetic characterization of capsule and complex formation.
- 5) Find out the importance of the industrial sector in research development (Industrial Secondment)

Expected Results:

The ESR will end the recruitment with having applied well-known gas-phase methods, but also with having developed new approaches to the gas-phase ion chemistry of non-covalent capsules and self-assembled cages. A thorough characterization of the capsules in solution and in the gas phase and in particular a comparison of both will add profound understanding of their behavior. Based thereon, capsule design and property prediction as well as the methodology for their characterization will advance significantly.

Planned secondment(s):

Academic secondment: Synthesis and characterization of calix[4]arene-based capsules in solution at ICHO PAN facilities (Poland).

Industrial Secondment: Six-month secondment at Mind the Byte facilities (Spain). ESR3 will acquire deep knowledge and know-how about computational simulations of the encapsulation systems in different situations to look for hypothetical applications.

Eligibility requirements

EU eligibility criteria for candidates: Candidates of any nationality, but in order to be eligible for the positions the following criteria applies to all applicants:

- The applicant shall at the time of recruitment be in the **first four years of his/her research career** and have **not been awarded a doctoral degree**.
- The applicant must not have resided or carried out his/her main activity in **Germany for more than 12 months in the 3 years immediately prior to the recruitment**.

Candidates profile: candidates must hold a **Master's degree in Chemistry** with excellent academic transcripts. We are looking for **highly motivated** students with **good communication skills**. All candidates must **prove full proficiency in spoken and written English** (B2 certificate, TOEFL, or equivalent).

Questions regarding the recruitment can be sent to: noah@noah-itn.eu.

Questions regarding the project can be sent to: c.schalley@fu-berlin.de

