

B i Si Bonds

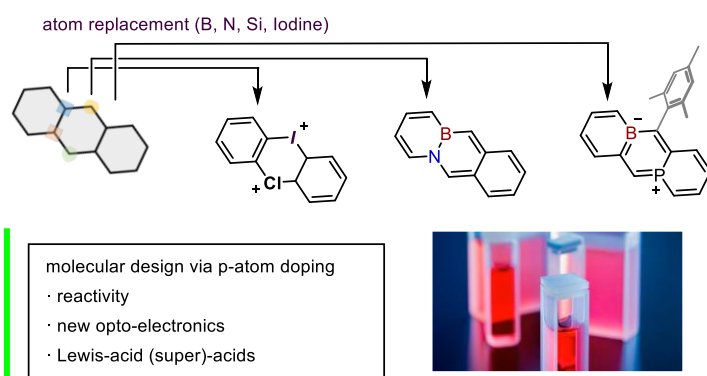
What: **PIF (doctoral) contract opportunity**

Where: Barcelona @ IQAC-CSIC and @ IQS-URL

<https://www.bisibonds.com/>

PhD Topic: Doping (poly)cyclic hydrocarbons with p-block elements: a game-changing approach to new reactivity, structure and function

BISIBonds is a Barcelona-based synthetic methodology research group, located at the Institute of Advanced Chemistry of Catalonia (IQAC-CSIC) and the Institut Químic de Sarrià (IQS-URL). The group is **seeking candidates to apply for PIF** doctoral contract, linked to a recently awarded research project (PID2023-146324NB-I00) from the Agencia Estatal de Investigación.



The structure and reactivity of cyclic carbon-based molecules—ranging from cyclopentane and benzene to graphene and nanotubes—are foundational to organic chemistry. Through the simple exercise of substituting individual carbon atoms with p-block elements such as boron, nitrogen, or high-valent halogens, one can envision the creation of unprecedented new ring systems. This approach serves as a powerful strategy for the molecular engineering of bioactive cores, catalysts, and organic optoelectronic materials. However, the practical synthesis of these molecules is often highly challenging, presenting a rich area of opportunity for inventive chemists ready to tackle these complexities. Our Barcelona-based team (BISi-Bonds) began exploring new synthetic methodology towards doped ring structures, recently reporting the first examples of rigid cycles based on halogen(III) atoms (JACS 2023), and offering a new approach boron-nitrogen (BN) doped aromatic compounds (Chem. Sci. 2024). To continue with this far-reaching project, we are now seeking a PhD candidate to work on new p-block element doped cyclic structure, with focus on super-acid materials, and on BN-doping for enhanced organic opto-electronic cores. Through this project, you will gain a deeper understanding of organic chemistry and molecular design, and will apply your creativity to chart routes to new doped heterocycles.

Candidates are expected to hold an undergraduate and a masters degree in Chemistry, or be in a position to obtain one shortly. Prior experience in organic or inorganic synthesis, catalysis or methodology will be a plus.

Aptitudes:

- Motivation, curiosity for chemistry and good observational skills
- Ability to connect experimental data and theory
- Good work ethics
- Fluent written and oral communication in English

Those interested should send their CV and a motivational letter to **Dr. Alexandr Shafir and Prof. Ana B. Cuenca**

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