

Post-doctoral/Research Engineer Position – 6 month contract

“Graphite-containing functional siloxane polymers”

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Keywords: potassium graphite, functional silane, siloxanes, innovation project.

Starting date / Duration: 6 months, starting in early 2023 (as soon as January)

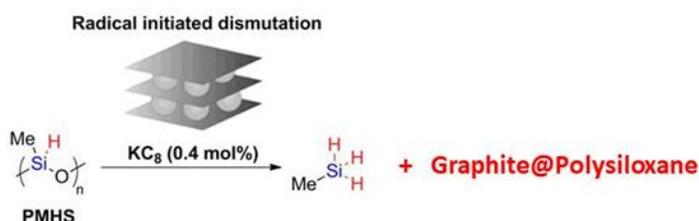
Funding: Sorbonne Université / Innovation funding (programme de prématuration)

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Website: <https://sophiecarencó.cnrs.fr>

About the team. The team Nano is hosted by *Sorbonne University* and *CNRS*. It is internationally recognized for the design and applications of nanomaterials. Metal oxides nanomaterials, and more recently metal-alloys nanomaterials that contain lighter elements (eg. metal carbides, metal phosphides) are prepared and studied both in academic and industrial projects for their applications in several fields: optical materials, automobile and aeronautics, energy harvesting and storage, industrial catalysis, nanomedicine.

Context of the project. This project is based on a patent recently deposited by the team. We found an innovative way to prepare siloxane polymers that contain controlled amount of graphite. The polymer is prepared at room temperature from one single step, using commercial silanes and a pyrophoric reactant: potassium graphite (KC₈). The polymer is then transformed into a ceramic by our collaborators at IEMN in Lille. Applications are sought in several fields, eg. for absorption of THz waves, which is a key to modern telecom (eg. 5G technology). Here, the aim is to tune the functionality and the rheology of the polymer in order to open potential markets.



Description of the missions. The fellow will prepare polymers with potassium graphite, various commercial silanes and additives. He/she will characterize them using microscopies and materials characterization techniques such as NMR. He/she will rationalize the properties of the polymers in relation the nature of the functional silanes used for its preparation and with the graphite content. He/she will take part to the scientific exchanges with our collaborators in Lille and with SATT Lutech (which is performing the market analysis).

Candidate Profile. The candidate should have hands-on experience with pyrophoric compounds. Ideally, he/she should be already familiar with the preparation of potassium graphite or other highly reactive species such as sodium naphthalenide. He/she should be already fully trained with Schlenk-line techniques. The candidate should have a background in molecular chemistry, polymer chemistry and/or materials synthesis. He/she should be willing to expand his/her culture regarding the other aspects of the project: ceramic formation and optical properties.

Application. CV with publication list (mentioning the nature and extent of your contributions in the most relevant papers). Please detail the pyrophoric compounds that you manipulated in the past. Please specify the names of your previous advisors (as a PhD student and/or in a previous post-doctoral stay) in your CV.

Reference: [1] X. Frogneux, A. Pesesse, S. Delacroix, F. Ribot and S. Carencó, *ChemCatChem*, 2019, **11**, 3781–3785.