



Institut de Science
des Matériaux de Mulhouse



**Post-doc position at Institut de Science des Matériaux de Mulhouse (CNRS UMR 7361)
“Development and optimization of green photoresists for DUV photolithography”
Supervisor : Olivier Soppera (olivier.soppera@uha.fr)**

Context

A 2-years *post-doc position* is opened at IS2M in the frame of the European Project “Resin Green”. This project aims to develop a viable direction for addressing the environmental challenges related to the semiconductor manufacturing. Our main idea is to propose new resist material platforms that can be processed under conditions offering clear advantages regarding reduction of environmental footprint. In particular, we will propose new resist chemistries targeting to materials than can be a) deposited and/or b) developed by using environmentally friendly solvents such as water, very dilute aqueous base solutions, or green organic solvents.

Research program

In this context, this post-doc will be devoted to develop polysaccharide resins for Deep-UV (193 nm) photolithography with partners in France (INL, ISA, IMS, CEA LETI), Greece, Switzerland and Germany, both academic and industrial. The study will start with chitosan, following our recent works (see reference below) and then be extended to other polysaccharides.

193-nm interference lithography tool developed in Mulhouse will be used for studying and optimizing the composition and process parameters for micro and nanopatterning the photoresists (both positive and negative tone). Spectroscopy (FTIR ATR, UV-vis) and microscopy (AFM, SEM) characterization will be used to investigate the physico-chemical parameters involved at molecular and microscale.

Skills

A PhD is required, in polymer science, physico-chemistry, nanotechnologies and/or photochemistry. Practical experience in laser instrumentation, photoresist processing and/or clean-room environment preferred.

Application

This 2-year postdoctoral fellowship at the Institut de Science des Matériaux de Mulhouse (CNRS UMR 7361, Université de Haute-Alsace) can begin as soon as administrative procedure is completed. Candidates can apply by sending their CV and a cover letter highlighting their experience and motivation for undertaking the project. Contact information for one or two reference persons should also be provided. Applications should be sent to: Dr Olivier Soppera (olivier.soppera@uha.fr).

References

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Leuschel, B. et al, *Scientific Reports* **2018**, 8, 15. doi: 10.1038/s41598-018-28196-1
Stehlin, F. et al, *Journal of Materials Chemistry C* **2014**, 2, 277-285. doi: 10.1039/c3tc31326c