

POST-DOCTORAL OPEN POSITION

Ultimate quality 3C-SiC single crystalline wafers for power electronics applications:
a proof of concept

Functions/ features	Post-doctoral position
Main Research Field	Materials Science, Wide bandgap semiconductors High temperature bulk crystal growth processes
Job Starting Date	01/03/2024 (flexible)
Duration	12 months
To apply	Follow this link.

Context and objectives

Silicon carbide (SiC) is a wide-bandgap semiconductor that is driving a profound evolution in power electronics. Among the various crystalline structures of SiC, the cubic SiC polytype known as 3C-SiC is an excellent candidate for medium-voltage, high-performance MOSFET devices. Unfortunately, there are currently no 3C-SiC wafers of a quality compatible with power electronics applications. The challenge is to reduce stacking faults (SF), electrically active defects in 3C-SiC, to a density of less than 500/cm. The main problem is that the industrial crystal growth process (seeded sublimation growth) requires temperatures in excess of 2000°C, which is not suitable for stabilizing 3C-SiC with the expected quality. The aim of this project is to explore a totally innovative implementation of the solution growth process, based on the traveling solvent method (TSM).

Structure description

The postdoctoral researcher will work at SIMaP Lab in Grenoble, in the heart of an outstanding scientific environment. SIMaP -Science and Engineering of Materials and Processes- (<https://simap.grenoble-inp.fr/en>) is a leading multidisciplinary laboratory gathering about 200 people from chemistry, physics, materials and fluids mechanics. *The candidate will work in Didier CHAUSSENDE's team, in a very dynamic local environment around SiC materials.*

Mission and main activities

The post-doc will demonstrate and develop a totally innovative implementation of the solution growth process, based on the Traveling Solvent Method (TSM). He/she will design the growth cell using numerical simulation, demonstrate the feasibility of the concept, optimize the growth rate, characterize the thick films, report, communicate and promote the results, participate in team management (supervision of trainees, etc.).

Expected profile

- PhD degree in materials science, materials chemistry with some background in crystal growth, characterization of crystals, multi-physics numerical simulation.
- Excellent experimental skills.
- Excellent writing skills, ability to report, publish and promote the results
- Good knowledge of English both spoken and written.
- Excellent communication and organizational skills.
- Interpersonal skills, problem-solving, rigor, initiative and teamwork abilities

Contact for the questions related to the position

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