TECHNISCHE UNIVERSITÄT WIEN

PhD Position
Photoelectrochemical porosification of 4H-SiC

TU Wien is located in the heart of Europe, in a cosmopolitan city of great cultural diversity. Our identity as a research university means that we build our reputation through our research. TU Wien combines basic and applied research and research-oriented teaching at the highest level.

The group of Prof. Ulrich Schmid at the Institute of Sensor and Actuator Systems invites applications for a 3.5-year PhD position (starting January, 2023) in the field of photoelectrochemical porosification of silicon carbide (4H-SiC).

The Project

Due to outstanding properties in comparison to silicon such as a large bandgap ensuring a high electric breakdown strength and a high thermal conductivity silicon carbide (SiC) is regarded as one of the most promising wide band gap semiconductors for future high power and high frequency electronic applications. Besides these well-known material parameters, advanced device architectures request novel approaches for fabrication. In recent years, photoelectrochemically porosified SiC emerged as promising technology to integrate optical elements (e.g. Rugate mirror) into single-crystalline SiC and to realize robust MEMS devices (e.g. membranes) in a tailored surface micromachining process. Furthermore, the surface to volume ratio could be increased for chemical sensor applications as well as the realization of membranes lifted-off from the SiC mother substrate was demonstrated.

Within the frame of an interdisciplinary research project, including 9 researchers and two company partners, it is our goal to deepen the understanding in the photoelectrochemical etching and porosification mechanisms of 4H-SiC.

The PhD will acquire knowledge about different porosification techniques of 4H-SiC. He or she will experimentally investigate the impact of process parameters (e.g. etching solutions, voltage profiles, etc.) on pore morphology, degree of porosity and functional groups formed on the surface. The obtained experimental results will provide important insights for a theoretical model which will be compiled by a postdoc also employed in the project.

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For more information about the project please contact the principal investigator (PI) Dr. Georg Pfusterschmied (georg.pfusterschmied@tuwien.ac.at).

Your Profile

For this most ambitious project we are looking for a motivated PhD student fulfilling these requirements:

- MSc degree or comparable degree in chemistry, physics, material science, electrical engineering or in a related subject
- A solid background in electrochemistry is regarded as strong plus.
- Knowledge micro- and nanofabrication and/or thin film deposition/analysis is beneficial.
- Organizational and analytical skills as well as a structured way of working.
- Solid written and oral communication skills in English.

We Offer

The successful candidate will work in the group of Prof. Ulrich Schmid under the guidance of Dr. Georg Pfusterschmied as PI at the Institute of Sensor and Actuator Systems located in the center of Vienna. The institute offers an international environment and excellent infrastructure. You can find more information about the group and the institute at https://mst.isas.tuwien.ac.at/home/. In addition, we offer

- Continuing personal and professional education and flexible working hours
- Central location of workplace with very good accessibility (U1/U4 Karlsplatz)
- A creative environment in one of the most livable cities in the world
- A highly competitive salary (Salary of the position is according to collective labor agreement for employees at universities, salary group B1, based on 31 hours per week, a gross salary of currently EUR 33.185,80 per year)
- Additional benefits for employees can be found at the following link: Fringe-Benefit Catalogue of TU Wien

Your Application

We invite highly qualified and motivated students having a strong interest in photoelectrochemical porosification of 4H-SiC to send us your detailed application documents (including a letter of motivation, CV grade transcripts and BSc/MSc diploma) in a single pdf file via email.

to phd3662@tuwien.ac.at until December 11th, 2022

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Candidates are not eligible for a refund of expenses for travelling and lodging related to the application process. TU Wien intends to increase the number of women on its faculty and therefore specifically invites applications by women. Among equally qualified applicants, women will receive preferential consideration.