Master's Thesis Proposal

Laboratory for Biomedical Microtechnology – Prof. Dr.-Ing. Thomas Stieglitz

Topic: Investigation of the homogeneity and atomic composition of low-temperature SiC-encapsulations for neural implants

Introduction

For long-term implantations of biomedical devices, the overall stability of a composite system consisting of a polymer substrate, integrated conductor tracks, and embedded µASICs must be guaranteed. While the stability of the individual materials in the physical environment is known and corresponds to the state of the art, this is not yet the case for an overall system consisting of these components.

Improving the systems stability can be achieved by employing adhesion promoting or encapsulating layers based on inorganic materials. These allow to create bonds between two otherwise incompatible materials beyond simple mechanical interlocking at their interfaces and pinhole free, protecting encapsulation of electronic components. In this work, this will be achieved with low-temperature PECVD SiC layers.

Objective

Process development for pinhole free low-temperature PECVD SiC layers with low impurities

Your tasks

- Researching deposition parameters for low-temperature PECVD SiC layers.
- Visualization of deposited SiC layers with FIB SEM imaging.
- Investigation of atomic composition with ToFSIMS, EDX, and XPS.
- Presenting and writing a thesis.

Your profile

- You are interested in the field of biomedical engineering in combination with MEMS fabrication techniques.
- (Ideally) you studied MST/MSE.
- You have experience/You are willing to learn how to work in a cleanroom (you ideally already have access to our IMTEK cleanroom in building 104).
- You can work in a concentrated, focused and structured way.

Logistics

- Location: Campus for Intelligent Machine-Brain Interfacing Technology (IMBIT)
- Earliest starting date: now
- Maximum length of the thesis: 6 months
- Language: German or English

Contact

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