

Direct Laser Metallization (DLM) of Polymers and Biocompatible Substrates using Different Precursors

Do you want to work with lasers, advanced materials, and explore the chemical transformations triggered by laser radiation? This Master's thesis offers you hands-on experience and a chance to be part of cutting-edge research shaping the electronics of the future.

Join this project to study the fundamental processes of direct laser metallization on substrates such as Polyimide (PI), FR-4, PET, and biocompatible materials like PDMS and hydrogels.

This method enables selective metal patterning without costly vacuum systems or complex photolithography.

In this Master's Thesis, you will explore how different promising precursors can be used for laser-induced metallization and how substrate properties affect the formation of conductive tracks. You will study how surface preparation — including roughening, plasma treatment, and laser structuring — influences adhesion, conductivity, and overall quality of the metal patterns.

You will gain hands-on experience in:

- Laser–material interactions
- Substrate surface modification techniques
- Fabrication of conductive tracks on flexible and rigid plastics
- Advanced characterization methods (SEM, EDX, Raman, electrical testing)
- Adhesion strength evaluation according to ISO standards

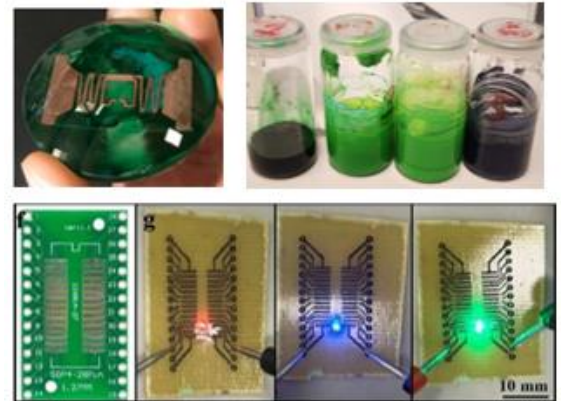
Goal: Develop optimized strategies for direct laser metallization to enable future flexible electronics, wearable sensors, and custom PCBs on industrially relevant materials.

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**Die Masterarbeit kann auch auf
Deutsch verfasst werden.**