Chair of Carbon Composites
TUM School of Engineering and Design
Technical University of Munich

Term Paper

Characterization of a novel sustainable thermoplastic polymer

Approximately 400 million tons of plastic are produced annually. The impact of plastics on the environment and their consequences are catastrophic and hardly foreseeable. Plastic production has been continuously increasing for decades, and despite more conscious consumer behavior, there is no sign of a decline in plastic production. Innovative solutions for new biodegradable polymers must be found, as conventional “biodegradable” polymers like PLA or PHB can usually only be fully composted in industrial facilities and therefore have not gained widespread acceptance.

I am looking for a motivated student to support me in my research on novel sustainable thermoplastic polymers for a wide range of applications. This field of work is highly future-oriented and will enhance our understanding of sustainable materials.

In the advertised project in the form of a semester thesis or in the form of a research internship, a previously newly synthesized biodegradable co-polymer is to be characterized with different methods. The main goal is to investigate the changes in material specific properties as a function of the modified monomers used in the synthesis in order to establish a new structure-property relationship for this new class of polymers.

Figure: Variety of applications for the new sustainable material

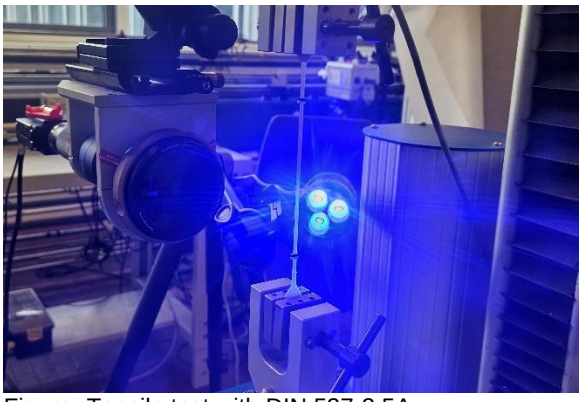

Figure**:** Tensile test with DIN 527-2 5A

Tasks

- Sample preparation for mechanical characterization: Hot pressing of tensile test specimens
- Mechanical Characterization of the polymers by tensile test or DMA
- Viscosity measurements on a rheometer
- Investigation of crystallinity in the polymer with XRD and DSC
- Investigation of defects in the polymer with cross-sectional samples
- Evaluation, preparation and documentation of the analytic data

Requirements

- Enthusiasm for advancing the field of sustainable polymers
- Analytical thinking skills
- Flexible time schedule
- Structured and independent way of working
- Experience in dealing with the above-mentioned analytics desirable

Starting date: Now

For more details please contact:
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