Master Thesis in Analytical Chemistry and Chemical Technology

Quantification in chemical recycling of bio-polyesters

The master thesis focuses on overcoming analytical challenges in quantifying depolymerization products of PHB (polyhydroxybutyrate) in e.g. melt hydrolysis. Key challenges include establishing reliable standards for oligomers and preserving volatile compounds in sample preparation. Developing precise quantification techniques enables a comprehensive analysis of product fractions, thereby enhancing and refining data driven models for the depolymerization process. This foundational work will support the development of a Digital Twin for chemical recycling of PHB.

Tasks

- Design analytical methods to resolve and quantify products of PHB depolymerization
- Establish a calibration protocol for quantification of product constituents
- Design a preparation procedure to retain volatiles obtained during recycling
- Validate the quantification method and compare with NMR and HPLC-MS techniques
- Investigate the correlation between molecular weight and acid number

Expertise

- Expertise in sample preparation and analytical techniques (NMR, HPLC-MS, HPLC-X)
- Knowledge in data analysis and method validation
- Good analytical and problem-solving skills
- Independent and structured workflow
- Effective communication skills in both English and German

Offer

- Work on creating the foundation for digitalization in sustainable polymer chemistry
- Collaborate with experts and hone your skills in analytical and polymer chemistry
- Benefit from a competitive salary as part of your contribution to this project
- Drive innovation in polymer recycling by contributing to data-driven models and sustainable solutions