

## Poison Study of Poly(lactic acid) Polymerisation from Biogenous Feedstock

Regina Itzinger, Christian Paulik

Institute for Chemical Technology of Organic Materials, Johannes Kepler University,  
Altenbergerstraße 69, 4040 Linz, Austria

Poly(lactic acid) (PLA) is one of the most promising polymers in the future. PLA is called to be a green polymer, both due to its possibility of being produced from biogenous feedstocks, such as starch, cellulosic materials, agricultural wastes, etc. and by the means of its biodegradability and biocompatibility. As the demand of bioplastics, and therefore PLA, is rising, poisoning effects in lactic acid polymerisation becomes an issue that needs to be investigated [1,2].

The experiment range is accurately defined and the experiments are carried out using statistical experimental design (Design of Experiment - DoE) to determine the influence of reaction parameters, such as time, catalyst concentration, and initiator concentration. Subsequently the lactic acid monomer is polluted with a defined amount of impurities contained in fermentative produced lactic acids to reveal the impurity's effects on the polymer. The obtained polymers are analysed by gel permeation chromatography GPC and differential scanning calorimetry DSC.

---

[1] Tan, J., Abdel-Rahman M.A., Sonomoto K.; Biorefinery-Based Lactic Acid Fermentation: Microbial Production of Pure Monomer Product. In: *Synthesis, Structure and Properties of Poly(lactic acid)*. Ed.: Di Lorenzo M., Androsch R., Advances in Polymer Science, Springer, (2017), 279, 27-66.

[2] Krishna B.S., Nikhilesh G.S.S., Tarun B., Saibaba N., Gopinadh R.; Industrial production of lactic acid and its applications, *International Journal of Biotech Research*, (2018), 1(1), 42-54.