

CoPIRIDE : new technical expertise relating to the anionic polymerisation of 1,3-Butadiene

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CoPIRIDE: New Technical Expertise Relating to the Anionic Polymerisation of 1,3-Butadiene

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CoPIRIDE is a flagship “Future Factory” project in the 7th Framework Program of the EU (www.copiride.eu). The entire goal of the project is processes intensification (PI) by increasing space-time yield (STY) while keeping product specification. Higher STY allows a compact design of the reactor to integrate it into a module that fits in a compact container infrastructure also in face of reducing time to market. The so-called Evotrainer includes the whole process as an enclosed system. By its standard size it is easy to bring it to the markets or where the educts are cheap.

Anionic Polymerisation of Butadiene – “Batch to Conti”

Living Anionic Polymerisation (LAP) provides tailor-made polymers with a definite microstructure, molar mass and low polydispersity (PDI). Usually this type of polymerisation is performed in a batch reactor that is characterized by full backmixing, but also by limitation of a comparatively low heat transfer that may cause a runaway at intense conditions. In contrast, reactions in micro-reactors can be performed at high concentrations and high temperatures due to their excellent heat transfer rates and pressure stability. But so far the PDIs of the performed polymers in continuous flow systems do not achieve the low PDIs of batch-made polymers yet.

Simulation results show that very low PDI are possible. The authors will show how this can happen and present first results of experimental evaluation – a combination of advantages from the batch design with the ones of a continuous system without losing product quality.

Furthermore, continuous flow conditions will have an impact on the microstructure of the polybutadiene. Dependency on temperature, ligand-initiator ratio and concentration will be presented. Effects of change and its direct influence on the products properties will be summarised.