Process intensification is a topic receiving high attention in the chemical industry. Reasons for this are the opportunities for a more efficient production process or legislations and regulatory constraints pushing towards smaller, cleaner, safer or more energy efficient technologies. One industry striving for a more efficient production mode is the peroxyester industry, by switching from a traditional series of batch operations to a continuous process. Peroxyesters are very effective initiators in the polymerization field. Furthermore, they find application as cross-linking, bleaching or oxidizing agents and pharmaceutical additives. The transition to a continuous peroxyester synthesis and purification requires a detailed understanding about how to carry out each batch operation continuously. Therefore, this study focused on the possibility for continuous operation of one of the purification steps: the drying of the peroxyesters.

In this research, a continuous process for peroxyester drying using concentrated salt solutions in a multistage spinning disc extractor was developed. With this novel technology, very high mass transfer rates could be achieved which enabled the drying within seconds and has the possibility to reduce the equipment size by a factor 100. These effects contribute to a higher productivity and a more safe production process of the highly explosive peroxyesters.