Continuous Production and Analysis of Epoxide-Crosslinked Cellulose Membranes

Dominik Ruhr[1,2], *Annette Reiche*[1]

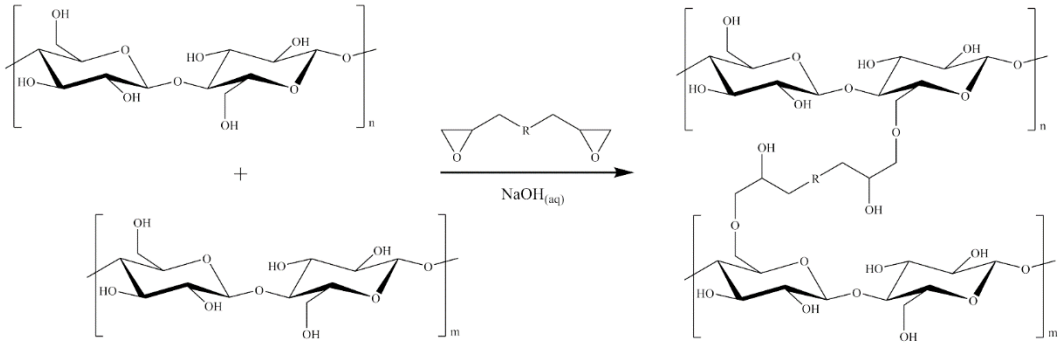
[1] *Sartorius Stedim Biotech GmbH, Göttingen/Germany*

[2] *Gottfried Wilhelm Leibniz Universität Hannover, Hannover/Germany*

Keywords: cellulose membranes, epoxides, crosslinking, biotechnology

A typical production process of biopharmaceuticals can be divided into upstream processes (USP) and downstream processes (DSP). Upstream processes refer to the production of biotechnological therapeutics and include early cell isolation, cultivation, culture expansion and harvesting of the cells. The following downstream processes focus on purification and enrichment of the biopharmaceuticals until the final filling of a stable formulation.

Filtration processes such as sterile filtration and bioburden reduction play a crucial role during downstream processes in order to yield a high quality and purity of the target pharmaceutical. Besides porous membranes based on polymers such as polyethersulfone (PES) or polyvinylidene difluoride (PVDF), also membranes based on regenerated cellulose (RC) may be used for different types of filtration. In order to enhance their dimensional and chemical stability under very alkaline conditions, these membranes have to be crosslinked chemically, e.g. with bifunctional epoxides:



This work presents the industrial production of crosslinked cellulose membranes on a new continuous production plant and introduces effective methods to analyze these membranes regarding the *efficiency* of the crosslinking under different operational/ process parameters.