widerstands in Versuchen in einem Strömungskanal sowie die Ermittlung der Ablagerungsmassen liefern Informationen über das Fouling- und Reinigungsverhalten. Die Eigenschaft der verbesserten Reinigbarkeit von PEEK gegenüber Edelstahl, die bereits in einer kürzlich erschienenen Publikation [1] für Calciumcarbonat-Ablagerungen aufgezeigt wurde, wird in diesem Beitrag für das Modellsystem Molkeproteinkonzentrat bestätigt. Es wird dargelegt, dass ein CIP mit einfachen Mitteln möglich ist.

[1] A. Ataki, H. Kiepfer, H.-J. Bart, *Heat Mass Transfer* **2020**, *56*, 1443–1452. DOI: 10.1007/s00231-019-02769-w

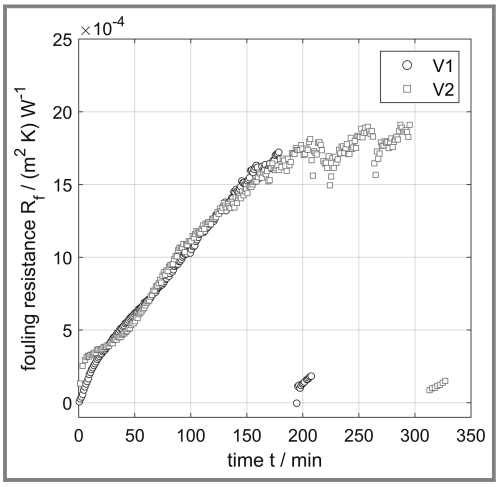

Abbildung. Reproduzierbare Abreinigung von Milchproteinablagerungen von PEEK. T^W = 90 °C.

P6.67 Fluidverfahrenstechnik

CFD for stirred bioreactors: Analysis of different multiphase models to determine oxygen mass transfer

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Oxygen supply of cells has a significant influence on cell growth and product yield. For this reason, biopharmaceutical manufacturers and their bioreactor suppliers are interested in optimizing the oxygen supply. In this context, computational fluid dynamics (CFD) can be used to calculate the k_La value in stirred bioreactors. First investigations have shown that both the volume-of-fluid (VOF) model and the compressible VOF model are unsuitable for the calculation of k_La values due to their lack of accuracy. Simulations with the Euler-Euler model showed significantly better agreement with experimental data, but the calculated k_La values were still about 50 % higher than in the experiments. One reason could be the missing consideration of gas bubble breakup and coalescence. Therefore, various investigations were carried out with a population balance model (PBM)-coupled Euler-Euler model, which all were in better agreement with the experimental data, compared to the Euler-Euler model. With the help of the successfully established PBM-coupled CFD model it is now possible to calculate the oxygen mass transfer for stirred bioreactors. Thus, bioreactor and process design can be accomplished before prototyping, and time-consuming as well as cost-intensive laboratory experiments can be reduced. In order to verify the generality for all sizes of bioreactors, further validation work will be carried out.

P6.68 Fluidverfahrenstechnik

Effects of hydrodynamic condition on gas nucleation and influences of gas nucleation on flotation

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DOI: 10.1002/cite.202055444

Most of the water in minerals flotation factories is the gas-saturated water due to the pressure equipment for transferring pulp such as pumps which can press air into the water to improve the degree of dissolved gas. Hydrodynamic conditions, gas saturation, electrolytes, surfactants, wettability, and roughness of minerals surface have significant influences on the flotation which also affect the formation of surface-nucleated bubbles.

A special system was designed for the gas nucleation process observation. The flow velocity in the laminar flow cell and the degree of gas dissolved in water in the system is recorded. The sample is embedded in the laminar flow cell, and laminar flow with different velocities runs through the sample surface. A high-speed microcamera and a quartz crystal microbalance (QCM) are used to record the

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