

Possibilities and Limits of PAT Compliant Measuring Systems for Online Determination of the Biomass Concentration

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According to the guidelines of the PAT (Process Analytical Technology) initiative of the FDA, an improvement of the understanding of bioprocesses, and higher process reliability can be achieved through online measurement methods. In this respect in-situ-procedures are especially advantageous, since they enable a contemporary measuring of a medium.

The biomass is an important process parameter, even if it is not the primarily intended product of cultivation in most industrial production applications. The cell growth is a defining parameter for the quality and efficiency of the cultivation process. The achievement of online process information in-situ is getting more and more important, but the requirements for in-situ systems are high and the technical implementation is complex. Limitations in the measurement quality arise especially in gassed systems, like aerobic cultivation processes [1, 2].

Present research reveals the possibilities and limits of different new measuring systems in aerobic cultivation processes, like the in-situ turbidimetry within near infrared zones, the focus beam reflectance measurement (FBRM) and the biO₂mass system. The biO₂mass System represents an in-house development, which correlates the biomass concentration by measuring the Oxygen Uptake Rate (OUR) in-situ [3, 4].

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