

IMPLEMENTING AUTOMATED PCO₂ CONTROL IN SMALL SCALE CELL CULTURE MODELS

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High carbon dioxide levels observed during scale up of a mammalian cell culture process were found to impact glycan levels of a monoclonal antibody. Small scale bioreactor and shake flask models were developed to achieve the high pCO₂ levels and profiles observed at large scale for process understanding studies. The precise reproduction of pCO₂ profiles in small scale models can be challenging, due to use of manual controls and to potential impact of high pCO₂ levels on other process parameters and quality attributes. For improved control, automation was applied to bench scale stirred tank bioreactors using an online pCO₂ probe and to ambr® 250 disposable bioreactors using an off-gas analyzer. Design of the automated CO₂ control strategy in these small scale bioreactor systems will be presented.