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**Model Predictive Control of Pressure Swing Adsorption**

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**Abstract**

Large-scale gas separations are an essential component of chemical processing systems. Pressure swing adsorption (PSA) processes have been shown to be economically favorable, as they operate at reasonable temperatures and pressures and are energetically efficient. However, since the demand profile of PSA separation can vary by as much as an order of magnitude, the inability to meet time-varying process demands leads either to wasteful overproduction or lower recovery of products and higher specific energy consumption. The goal of this research is to study advanced feedback control techniques to reduce the economic impact of these transient inefficiencies caused by poor control during varying production demands. In this research, we study the dynamics and control of PSA processes using simulator models as representative examples.