Rodrigues, A.E., **Pais**, L.S., Azevedo, D.C., and Minceva, M.

The Concept of Separation Volume for the Design of SMB Processes

in *AIChE 2000 Annual Meeting*, Los Angeles, CA, USA, November 12-17, 2000. *(comunicação oral)*

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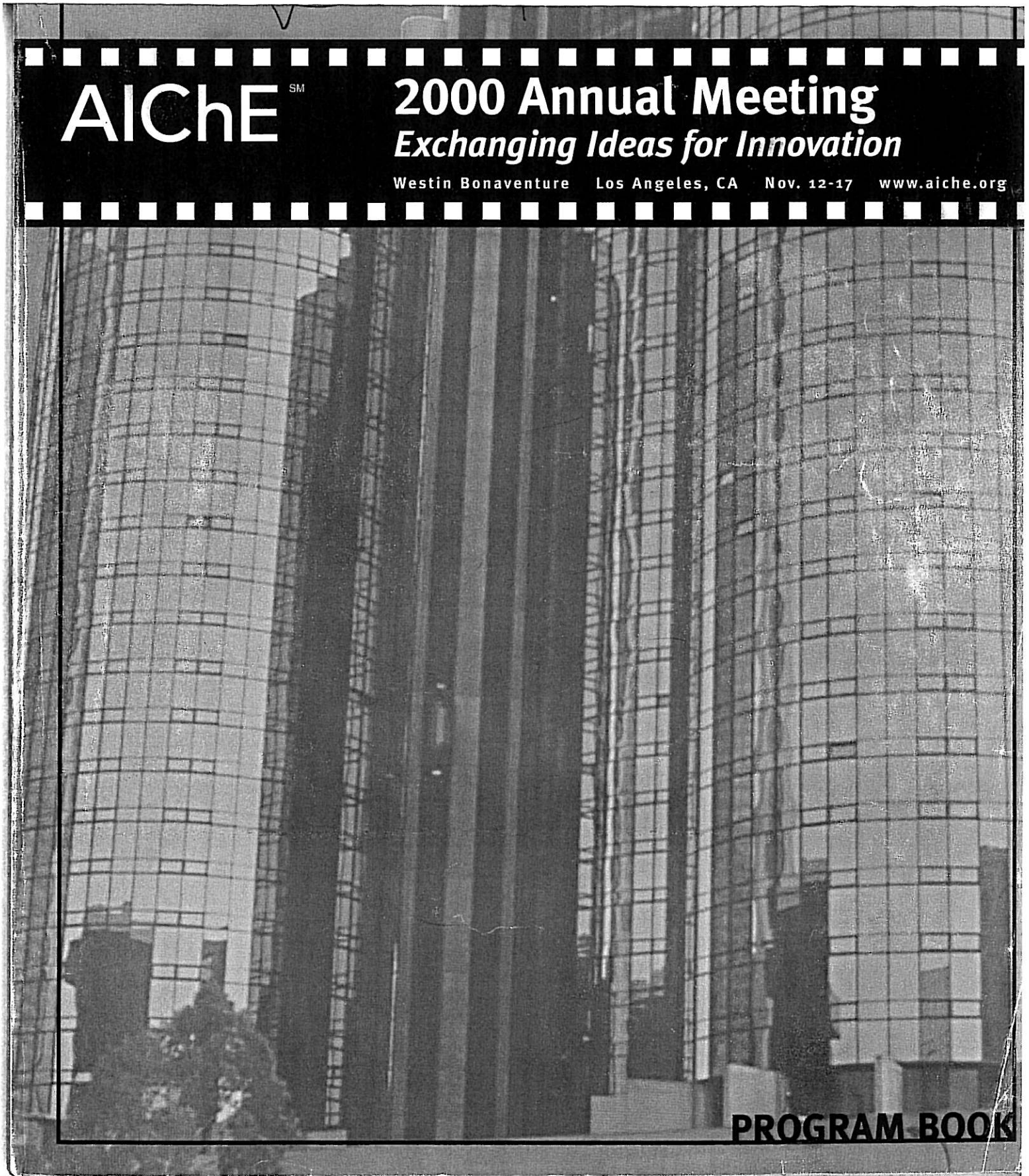

PROGRAM BOOK

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[156] - Advances in Simulated Moving Bed Technology

Thursday, November 16, 2000
Movie Theater 1 - Marriott

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Session Schedule

2:00 PM	Theoretical and Experimental Evaluation of the Influence of Column-to-Column Differences on the Performance of SMB Processes
2:20 PM	New SMB Operation Strategy - Partial Feed
2:40 PM	The Concept of Separation Volume for the Design of SMB Processes
3:00 PM	Simulation, Online Monitoring and Optimization for SMB Chromatography
3:20 PM	Break
3:35 PM	Gas-phase Simulated Moving Bed Separation of the Enantiomers of Inhalation Anaesthetics
3:55 PM	From Simulated Moving Bed to a New, Multi-Column Chromatography Process: The Equilibrium Theory in Question?
4:15 PM	A Simple Adsorber Dynamics Approach to Simulated Countercurrent Moving Bed Reactor Performance
4:35 PM	Application of Simulated Countercurrent Moving Bed Chromatographic Reactor for MTBE Synthesis

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Technical Program Menu

[156c] - The Concept of Separation Volume for the Design of SMB Processes

Presented at: [156] - Advances in Simulated Moving Bed Technology
For schedule information click here
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Abstract:

The concept of separation volume for the design of SMB processes

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The design of Simulated Moving Bed processes for linear, linear+Langmuir and bi-Langmuir systems in the absence of mass transfer resistances can be made based on the equilibrium theory. This leads to the concept of separation region in the plane m3-m2 where pure A and B species can be recovered in the exptract and raffinate streams, provided that constraints in flowrates in zones I and IV of the SMB are verified.

In the presence of mass transfer resistances these constraints suggested by the equilibrium theory have to be revised and the concept of separation volume is introduced and visualized in a 3-D plot of m1-m2-m3.

The examples studied at our laboratory include both old and new applications: the separation glucose/fructose where the adsorption isotherms are linear and mass transfer resistance inside the adsorbent is important, chiral separations (Sandoz epoxide and bi-naphtol enantiomers) typical of linear+Langmuir systems and xylenes separations over zeolite pellets where macropore diffusion is the controlling step.

Modeling/simulation was carried out either in steady-state or dynamic situations by using the equivalence with a true moving bed or directly simulating the SMB. The simulator developed at our laboratory is a powerful tool for understanding SMB processes, devising a new concept for designing SMB and training of personnel in industry. It allows the characterization of the process based on criteria of purity, recovery, solvent consumption and productivity.The model allows for intraparticle mass transfer described by a simple linear driving force model and fluid flow is described by axial dispersion model.
Experimental results from our laboratory were obtained in a pilot unit from Novasep (France).

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