

UCH843 SCALE-UP AND PILOT PLANT METHODS IN CHEMICAL ENGINEERING

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Scale up: Description and evolution of a process system, Introduction to Scale up procedures, Dimensional analysis, Similitude.

Reactors for Fluid Phase Processes Catalyzed by Solids: Pseudo-homogeneous and heterogeneous models, Two-dimensional models, Scale up considerations.

Fluid-fluid Reactors: Scale-up considerations in packed bed absorbers and bubble columns, Applicability of models to scale-up.

Mixing Processes: Scale-up relationships, Scale-up of polymerization units, Continuous stages gas-liquid slurry processes, Liquid-liquid emulsions.

Fluidized Beds: Major scale-up issues, Prediction of performance in large equipment, Practical commercial experience, Problem areas.

Solid-Liquid Separation Processes: Fundamental considerations, Small scale studies for equipment design and selection, Scale-up techniques, Uncertainties.

Continuous Mass Transfer Process: Fundamental considerations scale-up procedure for distillation, Absorption, Stripping and extraction units.

Text Books:

1. Marko Zlokarnik, Scale-up in chemical engineering, Wiley-VCH (2006).
2. R.E. Johnstone and M.W. Thring, Pilot Plants, Models and Scale-up Methods in Chemical Engineering, McGraw-Hill (1957).

Reference Books:

1. Colin Divall, Sean Johnston, Scaling up: the Institution of Chemical Engineers and the rise of a new profession, Springer (2000).
2. Bisio, A. and Kabel, R.L., Scale-up of Chemical Processes, John Wiley (1985).