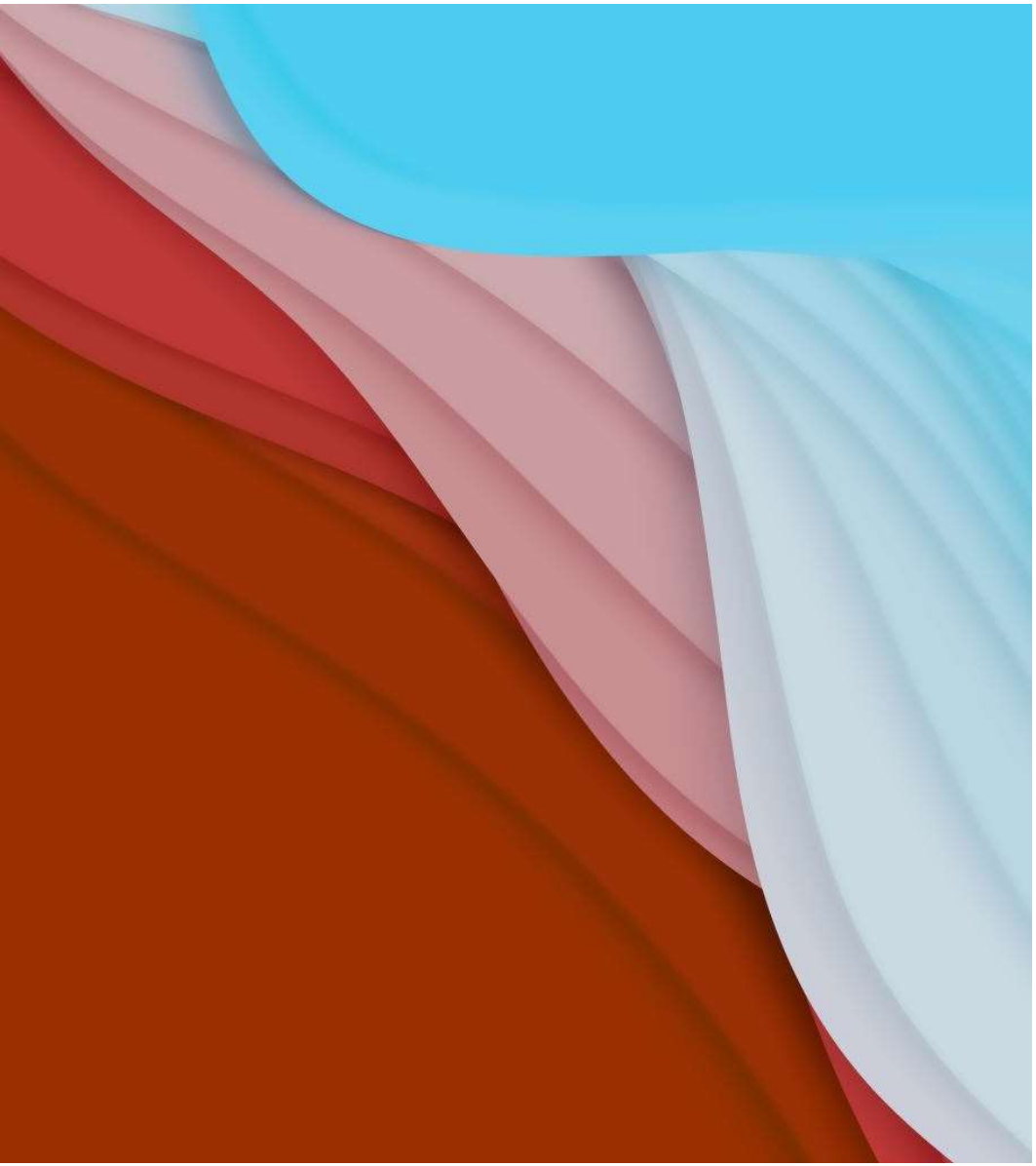

CEN416
PROCESS DESIGN II

Rigorous Computer Methods

The application of digital computers has made the rigorous solution of the MESH equations a practical proposition, and computer methods for the design of multicomponent separation columns will be available in most design organizations.

Several different approaches have been taken to develop programs that are efficient in the use of computer time, and suitable for the full range of multicomponent separation processes that are used in the process industries.

Rigorous Solution Procedure: Basic Steps

The basic steps **in any rigorous solution procedure will be:**

1. Specification of the problem; complete specification is essential for computer methods.
2. Selection of values for the iteration variables
3. A calculation procedure for the solution of the stage equations.

4. A procedure for the selection of new values for the iteration variables for each set of trial calculations.

5. A procedure to test for convergence; to check if a satisfactory solution has been achieved.

Available computer methods

It is convenient to consider the methods available under the following four headings:

1. Lewis-Matheson method.
2. Thiele-Geddes method.
3. Relaxation methods.
4. Linear algebra methods.

Rating and Design Methods

With the exception of the Lewis-Matheson method, all the methods listed above require the specification of the number of stages below and above the feed point.

They are therefore not directly applicable to design: where the designer wants to determine the number of stages required for a specified separation.

Iterative procedures are necessary to apply rating methods to the design of new columns.

An initial estimate of the number of stages can be made using short-cut methods and the programs used to calculate the product compositions; repeating the calculations with revised estimates till a satisfactory design is obtained.

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