

Recipes, Models, Chemical Processing and CRE

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Abstract

The essence of chemical engineering is to come up with recipes and models to help us efficiently make the materials wanted by man. For this purpose, in the first half of the 20th century, studies of reactor behavior focussed on the chemical reaction step and the book by Hougen and Watson was the guiding text for this approach. We call this the American approach.

In the 1950's European engineers broadened their scope to include the heat, mass, diffusion steps that affected the overall rate, plus the flow pattern of the fluid flowing through the reactor. These are all critical for getting a reasonable processing model. We call this the European approach Chemical Reaction Engineering or CRE.

The European approach is more teachable and in general is simpler and more direct, and thus has been widely adopted by engineers working in all sorts of areas.

In the coming century the dominant emphasis in chemical engineering will shift from the processing of petroleum to the processing of some other feed material. I suspect that it will be coal. I will end this talk with thoughts on ways to process coal to syngas.

This paper sketches this story.