



# Fractals, bifurcations and chaos in chemical reactors: Dynamics of chemical reactors

Marek Berezowski

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## Fractals, bifurcations and chaos in chemical reactors: Dynamics of chemical reactors Marek Berezowski

The heart of most chemical plants is a chemical reactor. They are described by system of differential equations. Each of these models can generate complex solutions, including: multiple steady states, periodic oscillations, quasiperiodic oscillations or chaos. Analysis of this equations requires the use of sophisticated mathematical methods and complex numerical algorithms. In this study these phenomena and methods of analysis were presented. Particular attention is paid to the bifurcation problems, chaotic oscillations and fractals. Different methods were presented which were used to solve above mention problems. The following concepts as: bifurcation, Lyapunov's exponent, Lyapunov's time and power spectrum were used for this purpose. Presentation of these phenomena on bifurcation diagrams and phase planes give fractal images. This study is based on the author's own research cycle.



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