

Abstract Submitted  
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**Stability Analysis of Benzene Hydrogenation**<sup>1</sup> JINPYO HONG,  
RICHARD KYUNG, CRG — The Euler method is explicit since the function is  
evaluated with known information. But it is not clear whether the Euler method  
is able to provide an accurate approximation to chemical engineering problems. To  
find answers to this question, this research presented examples which illustrate the  
properties of the Euler method. As an example, we analyzed the kinetics of benzene  
hydrogenation on a supported catalyst. In the presence of a large excess of hydrogen,  
the reaction shows pseudo-first-order at temperatures below a certain temperature.  
Also energy and material balance in the reactor has been studied under adiabatic  
process. As a result, formulation of the governing differential equations and evalua-  
tion of the stiffness have been carried out using Euler and the Runge-Kutta-Fehlberg  
methods.

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