Review of: "Another rate view on autocatalytic reactions"

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Potential competing interests: No potential competing interests to declare.

Comments about manuscript

Another rate view on autocatalytic reactions

by Miloslav Pekař

This manuscript deals with the current definition of “autocatalysis” and compares several propositions that differ in their basic statements. Moreover, emphasis on the double conception of recessive and expansive catalysis. As Prof. Pekař says, up to date the autocatalysis has not been defined using a unified concept. The manuscript focused on the pedagogical impact of this definition for chemical reactor students.

As a matter of fact, this note is a pleasure to be read by someone who teaches chemical reactor engineering in both, BsC and Postgraduate studies, as it is my case.

Suggestions for improving the manuscript.

The order of equations, figures and data is not convenient; it could be better if each table containing data is close to the figure which shows the simulation using these data and explaining the stoichiometric equation that is written close to them. For example, simulations in figure 1 (page 2) refers equation R2 (page 3), and data in table 1 (page 4). Worse, between table 1 and previous information concerning figure 1, there is another figure (Fig. 2, page 3). This ‘disorder’ makes the manuscript to be difficult to read. The problem remains all manuscript long.

Last paragraph, page 4: It starts as “Increasing the initial concentration of M changes the shape of the concentration profiles to a parabolic-like form”. I consider that, as consequence of the mathematical solution of transient mass balances for reactors, is better to say: “Increasing the initial concentration of M changes the shape of the concentration profiles to an exponential-like form”.

Fist paragraph, page 6: Is necessary to write Oswald’s words in German? I suggest including a translation to English, at least.

Page 12, beside figure 13. It says: “The standard mass-action kinetics used for this reaction in the Results section seems to be fully adequate and sufficient for describing this reaction, including its autocatalytic behavior”. This sentence is too rigorous, specially because at the end of page 10 and continuing in page 11, it is pointed out the importance of the adsorption of a reactant to the catalyst surface, which requires Langmuir-Hinshelwood-Hougen-Watson models to be

evaluated. I suggest deleting “fully adequate and”; this change makes the sentence softer, without contradiction with the main idea.

Finally, the Conclusions are centred on the IUPAC definition of autocatalysis, but the discussion was not. It seems to be a different focus in the comparison of interesting behaviour of different autocatalytic systems against a criticism of the IUPAC definition. In order to be coherent with the good discussion previously given, I suggest a more general conclusion about phenomena that could either occur or mask the autocatalytic behaviour of the reacting systems analysed, and then compare the discussion with the IUPAC’s definition.