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Editorial

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With this Special issue of Reaction Kinetics, Mechanisms and Catalysis, we honor Professor Slobodan Anić, on the occasion of his 70th birthday. He became interested in the oscillating Bray–Liebhafsky reaction early in his career, and spread the virus of nonlinear dynamics in the frame of the Belgrade group, which he founded and led, together with his main co-worker and wife Professor Ljiljana Kolar-Anić.

Professor Slobodan Anić

In this Special issue, there are articles of his collaborators, and friends or scientists who know Professor Anić and his work, who are with him co-authors of scientific papers, or with whom communicated and collaborated in the realization of international conferences related to fundamental and applied physical chemistry and nonlinear sciences during many years.

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The main results achieved by Slobodan Anić in the wide area of oscillating reactions are briefly sketched in an introductory paper of this issue by Professor Guy Schmitz [1]. The scientific contribution of Professor Anić and his collaborators is presented here as a part of the general, and large mosaic that is constantly created for many years by numerous very significant and well-known scientists.

Some new experimental findings on the existence and nature of bifurcations in Bray–Liebhafsky reaction are given in the paper by Pejić et al. [2]. Here, the temperature is used as the control parameter, but experiments at several mixed inflow hydrogen peroxide concentrations are performed. The shift of the supercritical Andronov-Hopf bifurcation towards higher temperatures is observed with increasing mixed inflow hydrogen peroxide concentrations. Further progress on the theoretical analysis of the Bray–Liebhafsky reaction is reported in a paper by Čupić et al. [3]. A new numerical technique to investigate slow manifolds of the reaction model is developed and used here. Multiple layered structures of the slow manifold are discovered and described. To encircle this area of investigation, the new variant of the model is proposed for the Bray–Liebhafsky reaction in the paper by Maćešić et al. [4]. This model is obtained by the reduction of the previous variant, and bifurcation analysis of the resulting scheme is given here.

Thanks to the hard work of Professor Slobodan Anić on popularizing oscillating reactions, reaction kinetics and physical chemistry in general, a wide cooperation between the Belgrade group and world-spread scientists is achieved in research of various interesting reaction systems. Some groups influenced by his work present their own results in this special issue. An interesting study of the Briggs–Rauscher reaction is presented in a paper by Furrow et al. [5]. A bistable transition to the steady state with high iodide concentration is observed after the completion of oscillation series and a possible mechanistic explanation is offered. Another reaction system investigation by Parker et al. [6] is focused on the PdI_2 catalysed phenyl acetylene carbonylation reaction. Oscillations in both turbidity and pH were observed at different temperatures in this report.

Furthermore, stochastic modelling of self-oscillations and surface concentration waves in CO oxidation reactions over different Pt surfaces was the subject of paper by Elokhin [7]. Glycolytic oscillations were explored by Muzika et al. [8] and Turing patterns were found in coupled reaction cells in a cyclic array. It was shown experimentally that transitions between Turing patterns and uniform oscillations are possible. Moreover, a simulation of traveling impulses was explored by Kawczińsky et al. [9]. A model of the enzymatic transformations was used in this case study. At the end of this part, in a paper by Maciejowska et al. [10], peptidization dynamics in the monocomponent amino acid solutions was compared against those in the binary mixtures. The main analytical technique to trace peptidization dynamics was high performance liquid chromatography with the evaporative light scattering detection. Synchronization of the oscillatory concentration changes of the monomeric amino acids is observed, witnessing to mutual cross-catalysis of the two counterparts.

Spreading the influences of Slobodan Anić on a wide area of investigations in chemical kinetics and catalysis is confirmed also by a few additional papers, which are not directly devoted to oscillatory reactions, but treat different nonlinear phenomena. Thus, iodine oxidation by hydrogen peroxide was explored by

Stanisavljev et al. [11]. For this purpose, a method for stopped-flow titrations of iodate ion in the presence of hydrogen peroxide is developed and established. A paper by Lončarević et al. [12] is dedicated to the simultaneous photocatalytic degradation of textile dyes using TiO_2 catalyst. Finally, an intriguing paper by Academician Parmon [13] gives some new insights into compensation effects.

I would like to thank especially Managing Editor Gábor Lente, who devoted his time and effort to realize this special issue, and also Editor-in-Chief István Fábián for recognizing the potential of the whole project and allowing its realization.

Dr Željko Čupić
Guest editor

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