

Mixed Mode, Sequential and Relaxation Oscillations in the Belousov-Zhabotinsky System

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The behaviour of a system composed of malonic acid (MA), KBrO_3 , H_2SO_4 , and ferroin was investigated in batch experiments at various concentrations of oxygen above the chemical mixture when changing the concentration of MA. We could observe that at 10% of oxygen or more and for initial concentrations of malonic acid $[\text{MA}]_0$ between 0.15 M and 0.6 M the system attains an equilibrium by some of mixed mode oscillations. Such a behaviour of the system could be described by a model used lately. Additionally for $[\text{MA}]_0 = 0.1$ M or less at 0–20% of oxygen a region of sequential oscillations was discovered (observed for the first time in the system with ferroin) and a trial of understanding of the event is suggested. For rather small $[\text{MA}]_0$ ca. 0.025 M no mixed mode oscillations, no sequential ones but the so-called relaxation oscillations were observed.

Key words: Belousov-Zhabotinsky System; Mixed Mode; Sequential and Relaxation Oscillations.