

Institute of Chemical Engineering

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The potential of *Stenotrophomonas maltophilia* KB2 for phenol degradation under exposure to heavy metal

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The large diversity of chemical substances present in air, water, or soil makes it necessary to study their mutual impact on the effectiveness of microbiological decomposition of contaminants. This publication presents the results of the studies aimed at evaluating the effect of two biogenic heavy metals – zinc and copper – on the phenol biodegradation by the *Stenotrophomonas maltophilia* KB2 strain. The tests were carried out for concentrations of metals significantly exceeding the legally permitted wastewater values: for zinc up to $13.3 \text{ g}\cdot\text{m}^{-3}$, and copper up to $3.33 \text{ g}\cdot\text{m}^{-3}$. In the tested metal concentration range, phenol biodegradation by the *S. maltophilia* KB2 strain was not significantly influenced by the introduced dose of zinc, while the presence of copper inhibited both biomass growth and substrate degradation. Kinetic data of metal and phenol mixtures were analyzed and very good correlations were obtained for the proposed equations. An equation consistent with the Han and Levenspiel model was proposed for the system *S. maltophilia* KB2-phenol-copper, while an equation consistent with the Kai model for the system *S. maltophilia* KB2-phenol-zinc. The simultaneous presence of Zn and Cu ions in the culture resulted in a stronger inhibition of phenol biodegradation.

Metryczka

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