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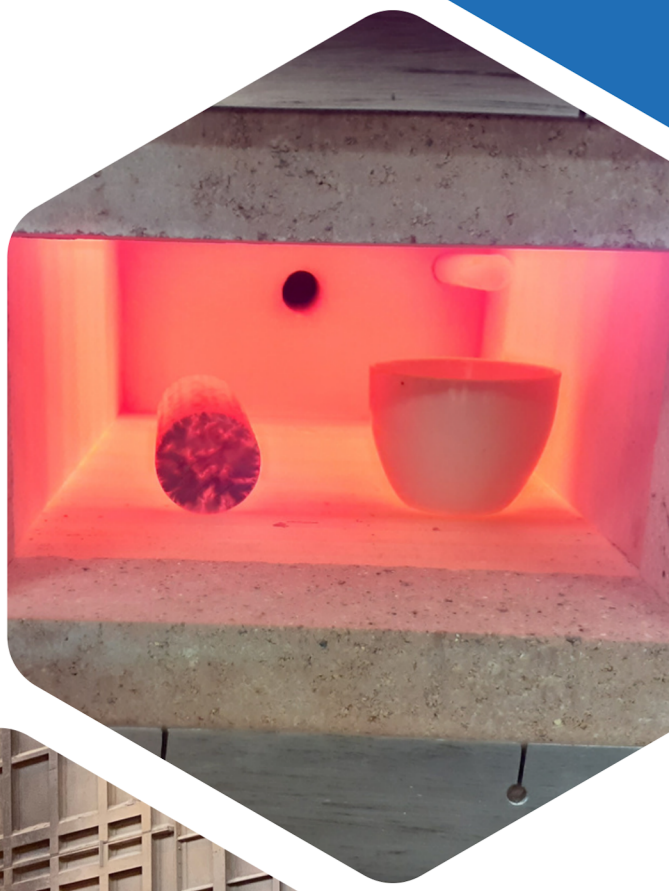

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REMOVAL OF CHLORPYRIFOS AND MALATHION USING SPENT COFFEE GROUNDS – ISOTHERM STUDY

Students: Vedran Milanković, Tamara Tasić

Mentor: Tamara Lazarević-Pašti

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Abstract

In recent years, the extensive use of chlorpyrifos (CHP) and malathion (MLT), two common organophosphate (OP) insecticides, has raised concerns about their adverse effects on the environment and human health [1]. These pesticides can contaminate water bodies, soil, and food, posing potential risks to non-target organisms and human populations [2, 3]. Therefore, there is a growing demand for effective and sustainable methods to remove these pesticides from the environment [4]. Spent coffee grounds (SCG), a readily available agricultural waste, have shown promising potential as an adsorbent [3]. The aim of this study was to investigate the removal of CHP and MLT using SCG as an adsorbent and to examine the adsorption behavior through isotherm analysis.

Isotherm analysis was performed using four isotherm models: Freundlich, Langmuir, Temkin, and Dubinin-Radushkevich. The experimental data best fit the Langmuir isotherm model, suggesting a monolayer adsorption process on homogeneous adsorption sites. According to the Langmuir isotherm, the maximum adsorption capacity of SCG for CHP and MLT is 2.34 mg/g and 7.04 mg/g, respectively. Additionally, the Freundlich isotherm model fitted the experimental data for MLT adsorption on SCG very well, implying multilayer physisorption even after all adsorption sites are occupied. These findings provide valuable insights into the feasibility of SCG as an eco-friendly approach for the removal of CHP and MLT from the environment. The energy of adsorption obtained from the Dubinin-Radushkevich isotherm confirmed that in the case of CHP adsorption the binding is stronger than in the case of MLT adsorption.

***Keywords**: Organophosphorous pesticides, Adsorption, Biowaste, Spent Coffee Grounds, Isotherms*

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REFERENCES

[1] V. Milanković, T. Lazarević-Pašti, Targeting Cellular Signalling Pathways in Lung diseases, Springer, 2021, p. 625-660.
[2] T. Tasić, V. Milanković, K. Batalović, S. Breitenbach, C. Unterweger, C. Fürst, I. Pašti, T. Lazarević-Pašti, Foods, 12 (12) (2023) 2362.
[3] V. Milanković, T. Tasić, M. Pejčić, I. Pašti, T. Lazarević-Pašti, Foods, 12 (12) (2023) 2397.
[4] V. Anićijević, T. Tasić, V. Milanković, S. Breitenbach, C. Unterweger, C. Fürst, D. Bajuk-Bogdanović, I. Pašti, T. Lazarević-Pašti, Int. J. of Enviro. Res. And Pub. Health, 20 (5) (2023) 4553.