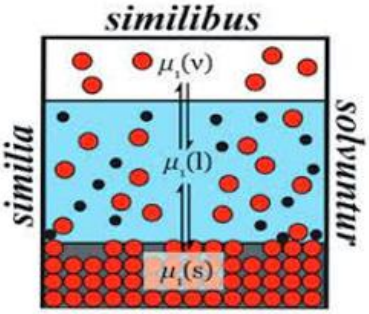

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P19
Green electrochemical sensor based on biochar for quantification of selected pesticides in aqueous solutions

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The sustainability of materials for developing the electrochemical sensor is crucial in the framework of a circular economy due to the need for environmentally friendly and greener analytical chemistry. The decrease in the impact of waste on the environment requires innovative approaches for biochar (BC) production and usage [1-2]. As a highly porous and carbon-rich material, BC has a desirable role as a catalytic material to enhance the analytical performance of BC-based sensors [3]. There has been a growing interest in the development of rapid and cost-effective techniques for detecting pesticides using electrochemical sensors with the possibility of their modification with sustainable materials [4]. Since the modification of carbon paste electrode (CPE) could improve the selectivity and sensitivity of trace level analysis of various electroactive analytes [5], the application of CPE modified with BC was investigated.

A sensitive and selective analytical method is developed regarding the voltammetric determination of fungicides maneb (MAN) and mancozeb (MCZ) using BC-CPE in an aqueous solution. The experimental conditions including pH of the supporting electrolyte, amount of BC in CPE, and differential pulse adsorptive stripping (DPAdSV) parameters were optimized. Under the optimal working conditions, the determination of MAN and MCZ was performed by applying the following DPAdSV parameters: E_{acc} = -0.2 V, t_{acc} = 90 s, and E_{acc} = -0.2 V, t_{acc} = 30 s, respectively. The linear increase of pesticides oxidation peak was recognized in a concentration range from 0.049–1.84 μg mL^{-1} MAN and 0.025–2.78 μg mL^{-1} MCZ in an aqueous Britton-Robinson buffer pH 7.0 using CPE modified with 10% BC. The relative standard deviation of six replicate measurements of MAN and MCZ was 3.2% and 2.9%, respectively, indicating a good repeatability of the developed DPAdSV method. The evaluated limit of detection of 0.015 μg mL^{-1} MAN and 0.0075 μg mL^{-1} MCZ indicated that the modification of CPE by BC provides a fast and sensitive determination of target analytes in an aqueous solution.

By exploring innovative solutions, electrochemical sensors based on BCs could provide monitoring of aquatic environmental samples to the control detrimental effects of pesticide residues.

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[1] P.S. Sfragano, S. Laschi, I. Palchetti, *Front. Chem.*, 2020, **8**, 644.
[2] R.A.A. Muñoz, *Microchim. Acta*, 2023, **190**, 486.
[3] J. Lee, K.-H. Kim, E.E. Kwon, *Renew. Sustain. Energy Rev.*, 2017, **77**, 70.
[4] H. Zhu, M. Li, C. Cheng, Y. Han, S. Fu, R. Li, G. Cao, M. Liu, C. Cui, J. Liu, X. Yang, *Foods*, 2023, **12**, 4274.
[5] H. Karimi-Maleh, F. Karimi, M. Rezapour, M. Bijad, M. Farsid, A. Beheshti, S.-A. Shahidi, *Curr. Anal. Chem.*, 2019, **15**, 410.