**Supplementary material**

 **Banana peel powder biosorbent for removal of hazardous organic pollutants from wastewater**

Kelly C. S. Fariasa, Rita C. A. Guimarães b, Karla R. W. Oliveirac, Carlos E. D. Nazárioc, Julio A. P. Ferencza,d and Heberton Wendera\*

aNano&Photon Research Group, Laboratory of Nanomaterials and Applied Nanotechnology (LNNA), Institute of Physics, Federal University of Mato Grosso do Sul, Campo Grande, Mato Grosso do Sul, 79070-900, Brazil

bGraduateProgram in Health and Development in the Midwest Region, Medical School, Federal University of Mato Grosso do Sul, Campo Grande 79070-900, Brazil

cInstitute of Chemistry, Federal University of Mato Grosso do Sul, 79070-900, Campo Grande, MS, Brazil

dFaculty of Engineering, Architecture and Urbanism and Geography, Federal University of Mato Grosso do Sul, 79070-900, Campo Grande, MS, Brazil.

\*Corresponding authors: heberton.wender@ufms.br



Figure S1. Kinetic models and intraparticle diffusion fits for MB removal using green (A, B), semi-ripe (C, D), and ripe (E, F) BPP. Conditions: 50 mg of BPP (biosorbent) and 50 mL MB dye solution at C0 = 50 mg L-1.



Figure S2. Fitted curves of the diffusion-chemisorption model for green (A), semi-ripe (B), and ripe (C) BPP. Conditions: 50 mg of BPP (biosorbent) and 50 mL MB dye solution at C0 = 50 mg L-1.

Table S1. Parameters obtained from the diffusion-chemisorption model for MB removal using green, semi-ripe, and ripe banana peel flour as biosorbent.

|  |  |
| --- | --- |
| **Parameters** |  **Ripeness stage** |
| *Green* | *Semi-ripe* | *Ripe* |
| **Diffusion-chemisorption** |
| $$k\_{DC}(mg g^{-1} min^{-0.5})$$ | 32.76 | 31.40 | 26.25 |
| $$q\_{e}(mg g^{-1})$$ | 33.26 | 36.85 | 36.61 |
| $$R\_{adj}^{2}$$ | 0.99651 | 0.99158 | 0.99479 |
| Residual sum of squares | 1.92.10-5 | 3.79.10-5 | 2.37.10-5 |



Figure S3. Fitted curves of the different kinetic models studied for semi-ripe BPP using glyphosate (A) and atrazine (C) as a pollutant and the intraparticle diffusion fit for glyphosate (B) and atrazine (D). Conditions: 60 mg of semi-ripe BPP and 10 mL of the pesticide at C0 = 20 mg L-1.