Supporting Information

Antimicrobial activity against *Fusarium oxysporum f. sp. dianthi* of TiO_2/ZnO thin films under UV Irradiation: Experimental and Theoretical study

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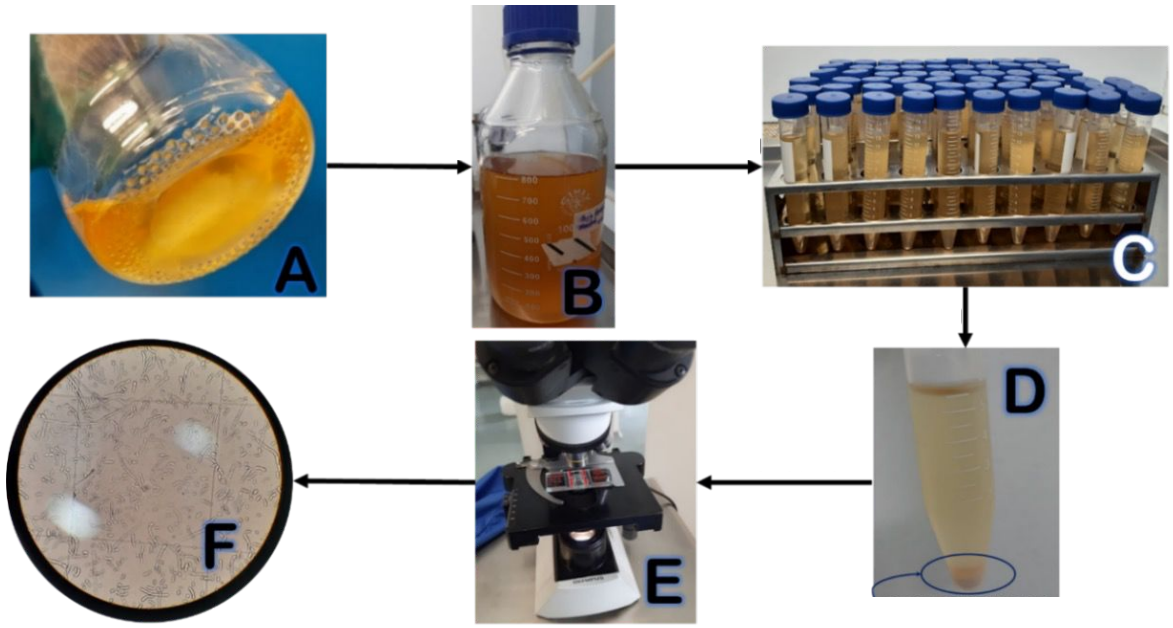

Figure S1. Process of collection and counting of *Fusarium oxysporum f. sp. Dianthi.* (A) Sample, (B) filtration, (C) distinction, (D) centrifugation, (E) sampling, (E) spores counting, (F) photo of spores counting.

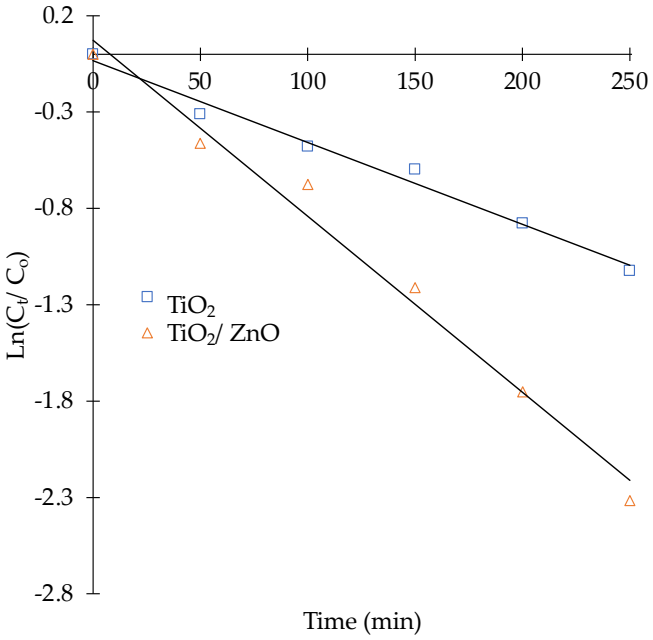

Figure S2. Langmuir−Hinshelwood fitting model of kinetical results shown in figure 10.

Section S1. Kinetic study models

We studied the kinetic adsorption behavior of BM onto all materials fabricated by using the pseudo-first (1) and pseudo-second (2) kinetic models according to these equations:[1]

$$\ln(q_t - q_e) = \ln(q_e) - k_1 t \quad (1)$$

$$\frac{t}{q_t} = \frac{1}{k_2 q_e^2} + \frac{t}{q_e} \quad (2)$$

$$q_t = k_{id} t^{1/2} + C \quad (3)$$

Where q_t is the MB amount of adsorpted per unit mass of the adsorbent (mg g^{-1}) at in every time. q_e is the maximum sorption capacity (mg g^{-1}) and k_1 (min^{-1}) and k_2 (g $mg^{-1}min^{-1}$) are the rate constants of the pseudo-first and pseudo-second order models respectively. The k_{id} (mg/ $g^{-1}min^{1/2}$) is the intraparticle diffusion rate constant. The fitting correlation coefficient (R^2) and an average relative error (ARE) were used to determine the best-fitting isotherm:

$$ARE = \frac{100}{n}\sum_{i=1}^{n} \frac{|q_e - q_f|}{q_e} \quad (4)$$

where, q_e is the experimental value, q_f is the fitted value, and n is the number of data points.[2]

References

(1) Hamzenejad Taghlidabad, R.; Sepehr, E.; Khodaverdiloo, H.; Samadi, A.; Rasouli-Sadaghiani, M. H. Characterization of Cadmium Adsorption on Two Cost-Effective Biochars for Water Treatment. *Arab. J. Geosci.* **2020**, *13* (12), 1–10. https://doi.org/10.1007/S12517-020-05477-6/METRICS.

(2) Diaz-Uribe, C.; Walteros, L.; Duran, F.; Vallejo, W.; Romero Bohórquez, A. R. Prosopis Juliflora Seed Waste as Biochar for the Removal of Blue Methylene: A Thermodynamic and Kinetic Study . *ACS Omega* **2022**. https://doi.org/10.1021/ACSOMEGA.2C05007/ASSET/IMAGES/LARGE/AO2C05007_0010.JPEG.