

PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA
Ministry of Higher Education and Scientific Research

Ecole Nationale Polytechnique



LAVALEFF

Department: Chemical Engineering
Laboratory for Fossil Energy Valorization



THESIS

Submitted by Amira OTHMANI

in Fulfillment of the Requirements for the Degree of Doctor of Science

Valorization of Non-Living Microbial Biomass for the Adsorptive Removal of Cationic Dyes from Multicomponent Aqueous Systems: Mechanistic Study, DFT Adsorption Energy Analysis, Modeling, and Machine Learning-Based Optimization.

Under the supervision of Prof.: Ammar SELATNIA

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