الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي والبحث العلمي
جامعة قسنطينة 1 – الإخوة منتوري
كليـة العلوم الد قيقة

PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA
MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH
Constantine 1 University – Frères Mentouri
Faculty of Exact Sciences

ANNONCE DE SOUTENANCE

Conformément à la décision n° **27/D3C/2026 datée** du **25 Février 2026** autorisant la soutenance d'une thèse de doctorat, le Vice-doyennat chargé de la post-graduation, de la recherche scientifique et des relations extérieures, a n n o n c e la soutenance publique d'une thèse de doctorat le :

Dimanche 15 Mars 2026 à 16H00

Lieu : A la salle de conférences sise au Campus Chaab Erssas - Constantine 1 – Frères Mentouri
Filière : **CHIMIE**
Spécialité : Chimie analytique et environnement

Doctorant: **SELLAM Badreddine**

Sur le thème : « Dégradation du métobromuron : évaluation de l'activation du peroxyde de calcium par le complexe Fe(III) –picolinique avec et sans irradiation en solution aqueuse».

Devant le jury d'examen :

	Nom et prénoms	Grade	Etablissement d'appartenance
Présidente	KAABAR Wahiba	Professeure	Université Constantine1, Frères Mentouri
Directrice de thèse	SERAGHNI Nassira	Professeure	Université Constantine1, Frères Mentouri
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	BENSSASSI Mohamed El-hadi	M.C.A	Université Salah Boubnider Constantine 3

Abstract

In response to the growing contamination of water resources by herbicides, this thesis focuses on the development of advanced oxidation processes (AOPs) for the degradation of metobromuron (MTB), a persistent herbicide that is difficult to remove using conventional treatment methods.

The main objective of this work is to evaluate the efficiency of calcium peroxide (CaO2) activated by the Fe(III)-picolinic complex in Fenton-like and photo-Fenton-like systems, under both light and dark conditions.

In the first stage, the Fe(III)-picolinic complex was synthesized and characterized to determine its chemical and photochemical properties, as well as its behavior as a function of pH and irradiation type. The results showed that this complex exhibits high stability in solution and enhanced photochemical activity in acidic media, promoting the generation of hydroxyl radicals (•OH).

In the second stage, the Fe3+/CaO2 system was investigated for the degradation of metobromuron. UVA irradiation significantly improved the process performance, achieving a 97% removal rate within 20 minutes due to an increased production of oxidative radicals.

Finally, the combination of the Fe(III)-picolinic complex with CaO2resulted in a highly efficient synergistic system, effective over a wide pH range and resistant to common anions. Theoretical studies (DFT) allowed the identification of the most reactive molecular sites of metobromuron, confirming the experimental findings.

This work demonstrates that the Fe(III)-picolinic/ CaO2UVA system represents an innovative, sustainable, and efficient approach for the removal of recalcitrant organic herbicides, paving the way for new applications in the treatment of contaminated water using natural light sources.

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