

## MUSTAPHA AIT ALI

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### CURSUS ENSEIGNEMENT ET RECHERCHE

**2021-présent** Chef du Département de Chimie, FSSM-Université Cadi Ayyad Marrakech.

**2005-présent** Professeur, FSSM-Université Cadi Ayyad Marrakech.

**2001-2005** Maître de Conférences, FSSM-Université Cadi Ayyad Marrakech.

**2001** Thèse de doctorat d'Etat, Spécialité « Chimie Organique et Catalyse », FSSM-Université Cadi Ayyad.

**1995-2001** Maître-assistant, FSSM-Université Cadi Ayyad Marrakech.

**1992** Thèse de troisième cycle, Spécialité « Chimie Organique et Catalyse », FSSM-Université Cadi Ayyad Marrakech.

**Juin 1988** DEA de Chimie Organique et Catalyse, FSSM-Université Cadi Ayyad Marrakech.

### ACTIVITES DE RECHERCHE

- ✚ Synthèse de nouveaux nanomatériaux 2D à base de silicium ; phosphore, Application dans le stockage et production de l'énergie....
- ✚ La chimie verte : développement de catalyseurs recyclables à base de nanomatériaux ;
- ✚ Synthèse et caractérisation des complexes à base de métaux de transitions.
- ✚ Catalyse homogène, nanocatalyse et catalyse hétérogène (catalyse asymétrique, hydrogénation, oxydation, Fonctionnalisation (chloration, amination, hydroxylation...).
- ✚ Décoloration des eaux usées et des Margines : dégradation par traitement avec des nanomatériaux.

Professeur invité à la Faculté de Technologie de l'Université Ferhat Abbas Sétif-1 Algérie, ENS Chimie de Rennes France et à l'Université de Cergy Pontoise France.

Co-auteur de 146 articles publiés dans des revues à comité de lecture de premier plan et plus de communication dans des congrès internationaux.

Membre actif dans l'organisation des conférences internationales :

- Euromediterranean conference on materials and renewable energies: EMCMRE-1(2011), -2(2013), -3(2015), -4(2017) et -5(2019) ;
- International symposium on dielectric materials and applications: ISyDMA-1 (2016), -2(2017), -3(2018), -4(2019), -5(2020), -6(2021), -7(2023) et -8(2024).

#### ***Bilan chiffré de mes activités de recherche :***

- 12 thèses encadrées, 6 thèses co-encadrées.
- 146 publications parues dans des journaux internationaux.
- 68 publications parues dans des journaux internationaux pour les années **2018-2023**.
- Conférences dans des congrès internationaux : EMCMRE-2(2013, Istres France), -3(2015 Paris France), -4(2017, Marrakech Maroc) et -5(2019 Marrakech Maroc) ; ISyDMA-3(2018, Marrakech Maroc), -4(2019, Aman Jordanie), Nano-TN 2018 et 2020 Marrakech Maroc...
- Plus de 25 communications orales et 40 communications par affiche.

### **Indicateurs bibliométriques:**

[https://scholar.google.com/citations?hl=fr&user=F1QSv18AAAAJ&view\\_op=list\\_works](https://scholar.google.com/citations?hl=fr&user=F1QSv18AAAAJ&view_op=list_works)

- Nombre total d'articles Web of Science: **146**
- Indice h **20**
- Somme du nombre de citations : **1678**

### **Projets de recherches :**

PHC Toubkal (2014-2017) : Nanocatalyseurs d'oxydation allylique d'oléfines terpéniques vers la valorisation éco-compatible d'agro-ressources marocaines

Projet APHOS (2017-2020) : Le potentiel du phosphorène, extrait du phosphate, pour le stockage et la conversion de l'énergie.

Projet ENSUS (2023-2024) : 2D silicon/black phosphorus electrode as innovative anodes for Li-ion batteries

### **Publications marquantes :**

✚ Mohamed Rachid Tchalala, Hanna Enriquez, Andrew J. Mayne, Abdelkader Kara, Silvan Roth, Mathieu G. Silly, Azzedine Bendounan, Fausto Sirotti, Thomas Greber, Bernard Aufray, G\_erald Dujardin, Mustapha Ait Ali, and Hamid Oughaddou, Formation of one-dimensional self-assembled silicon nanoribbons on Au(110)-(231), APPLIED PHYSICS LETTERS 102, 083107 (2013).

✚ Mohamed Rachid Tchalala, Mustapha Ait Ali, Hanna Enriquez, Abdelkader Kara, Abdessadek Lachgar, Said Yagoubi, Eddy Foy, Enrique Vega, Azzedine Bendounan, Mathieu G Silly, Fausto Sirotti, Serge Nitshe, Damien Chaudanson, Haik Jamgotchian, Bernard Aufray, Andrew J Mayne, G\_erald Dujardin and Hamid Oughaddou, Silicon sheets by redox assisted chemical exfoliation, J. Phys.: Condens. Matter 25 (2013) 442001 (5pp).

✚ Mustapha Ait Ali and Mohamed Rachid Tchalala, Chemical Synthesis of Silicon Nanosheets from layered calcium disilicide, Journal of Physics: Conference Series 491 (2014) 012009.

✚ Mohammed Rachid Tchalala, Hanna Enriquez, Andrew J. Mayne, Abdelkader Kara, G\_erald Dujardin, Mustapha Ait Ali and Hamid Oughaddou, Atomic structure of silicene nanoribbons on Ag(110), Journal of Physics: Conference Series 491 (2014) 012002.

✚ Mohamed Rachid Tchalala, Hanna Enriquez, Handan Yildirim, Abdelkader Kara, Andrew J. Mayne, G\_erald Dujardin, Mustapha Ait Ali and Hamid Oughaddou, Atomic and electronic structures of the  $(\sqrt{13} \times \sqrt{13})R13.9^\circ$  of silicene sheet on Ag(111), accepted Applied Surface Science (2014), reference APSUSC 27280.

✚ Rachid Outouch, Mariem Rauchdi, Brahim Boualy, Larbi El Firdoussi, Alain Roucoux and Mustapha Ait Ali, Calcium Trifluoroacetate as an Efficient Catalyst for Ring-opening of Epoxides by Amines under Solvent-free Conditions Acta Chim. Slov. 2014, 61, 67–72

✚ Lahcen Nkhaili, Abdelkader El kissani, Mustapha Ait Ali, Youssef Ijdiyaou, Abdelmajid Elmansouri, Abdel-Ilah Elkhalfi, and Abdelkader Outzourhit "Effect of RF power on the structural and optical properties of RF-sputtered ZnO thin films" Eur. Phys. J. Appl. Phys. (2014) 66: 30302.

✚ Issam Houssini, Mohamed Anouar Harrad, Brahim Boualy, Abdelaziz Ouahrouch, Mohamed Loughzail, Mustapha Ait Ali, Abdellah Karim "Development of a Sustainable and Solventless Friedel-Crafts Acylation Reaction of an Aromatic Natural Product "Ar-Himachalene" over Nanostructured ZnO as a New Catalyst" Chemistry and Materials Research ISSN 2224- 3224 (Print) ISSN 2225- 0956 (Online) Vol.6 No.3, 2014

- ✚ Mohamed Anouar Harrad, Issam Houssini, Brahim Boualy, Abdelaziz Ouahrouch, Mustapha Ait Ali, Mohamed Loughzail, Natural phosphate as new, highly efficient and reusable heterogeneous catalyst for the selective preparation of beta-enaminoesters under solvent-free conditions, *Chemistry and Materials Research* ISSN 2224- 3224 (Print) ISSN 2225- 0956 (Online) Vol.6 No.3, **2014**
- ✚ Hamid Oughaddou, Hanna Enriquez, Mohammed Rachid Tchalala , Handan Yildirim, Andrew J. Mayne, Azzedine Bendounan, Gerald Dujardin, Mustapha Ait Ali, Abdelkader Kara, Silicene, a promising new 2D material, *Progress in Surface Science* 90 (2015) 46–83.
- ✚ L. Nkhaili, M. Elyaagoubia, A. Elmansouria, A. El kissani, A. El Khalfi, A. Elfathi, M. Ait Ali & A. Outzourhit , Structural, Optical, and Electrical Characteristics of Zinc Oxide and Copper Oxide Films and Their Heterojunctions, *Spectroscopy Letters* **2015** 48: 536–541
- ✚ Hamid Oughaddou, Hanna Enriquez, Mohammed Rachid Tchalala, Handan Yildirim, Andrew J Mayne, Azzedine Bendounan, Gérald Dujardin, Mustapha Ait Ali, Abdelkader Kara, Silicene, a promising new 2D material, *Progress in Surface Science*, **2015** Volume 90, Issue 1, Pages 46–83
- ✚ Brahim Boualy, Soufiane El Houssame, Luca Sancineto, Claudio Santi, Mustapha Ait Ali, Helen Stoeckli-Evans, Larbi El Firdoussi, A mild and efficient method for the synthesis of a new optically active diallyl selenide and its catalytic activity in the allylic chlorination of natural terpene, *New J. Chem.*, **2016**,40, 3395-3399
- ✚ Abdelhadi Louroubi , Halima Ouahine , Brahim Boualy , Mustapha Ait Ali and Larbi El Firdoussi, Natural Hydroxyapatite Ca<sub>5</sub>(PO<sub>4</sub>)<sub>3</sub>OH: An Efficient Catalyst for the Chemo- and Regioselective Enamination of the  $\beta$ -Ketoesters, *Journal of Advanced Catalysis Science and Technology*, **2016**, 13, 63-67.
- ✚ Hana Ighachane, Brahim Boualy, Mustapha Ait Ali, My. H. Sedra, Larbi El Firdoussi, and Hassan Bihi Lazrek “Catalytic Synthesis and Antifungal Activity of New Polychlorinated Natural Terpenes” *Advances in Materials Science and Engineering* Volume **2017**, Article ID 2784303.
- ✚ Mariem Rauchdi, Mustapha Ait Ali, Alain Roucoux, Audrey Denicourt-Nowicki “Novel access to verbenone via ruthenium nanoparticles-catalyzed oxidation of  $\alpha$ -pinene in neat water” *Applied Catalysis A, General* 550 (**2018**) 266–273
- ✚ L. Fkhar, B. Abraime, E. Salmani, K. El Maalam, M. Hamedoun, M. Ait Ali, H. Ez-Zahraouy, A. Benyoussef and O. Mounkachi, Book chapter: Enhancement of Superparamagnetic Properties in Sn-Doped Nanocrystalline Cobalt Ferrite; First-Principle vs Experimental Design of Nanomaterials; ISBN: 978-1-53613-984-6, Publication Date: November **2018**, Status: At Press 198 pages
- ✚ G. Tiouitchi, M. Ait Ali, A. Benyoussef, M. Hamedoun, A. Lachgar, M. Benaissa, A. Kara, A. Ennaoui, A. Mahmoud, F. Boschini, H. Oughaddou, A. El Kenz, O. Mounkachi, An easy route to synthesize high-quality black phosphorus from amorphous red phosphorus, *Materials Letters* 236 (**2019**) 56–59
- ✚ Ali Hasnaoui , Ismail Hdoufane , Rachid Idouhli, Bruno Therrien, Mustapha Ait Ali, Larbi El Firdoussi, Crystal structure of {N-(2-hydroxyethylamino)ethylsalicylaldiminato}-palladium(II) chloride}: Synthesis, X-ray structure, electrochemistry, DFT and TDDFT studies, *Journal of Molecular Structure* 1176 (**2019**) 703e710
- ✚ Audrey Denicourt-Nowicki, Mariem Rauchdi, Mustapha Ait Ali, and Alain Roucoux, Catalytic Oxidation Processes for the Upgrading of Terpenes: State-of-the-Art and Future Trends, *Catalysts* **2019**, 9, 893; doi:10.3390/catal9110893
- ✚ Halima Ouahine, Ali Hasnaoui, Ismail Hdoufane, Rachid Idouhli, Abdessalam Abouelfida, Mustapha Ait Ali, Larbi El Firdoussi, Benzo [c][1, 2, 5] selenadiazole organoselenium derivatives: Synthesis, X-ray, DFT, Fukui analysis and electrochemical behavior, *Journal of Molecular Structure* 1199(**2020**), 126914

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- ✚ Nd-Doping-Induced Enhancement in the Antibacterial Activity of Synthesized ZnO Heretostructures, L Fkhar, HA Oualid, A Sayout, Y Abdellaoui, Y Brahmi, O Mounkachi, ...*ChemistrySelect* 5 (36), 11331-11339, **2020**
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- ✚ A study of magnetic and magnetocaloric properties of 0.95 (La<sub>0.45</sub>Nd<sub>0.25</sub>Sr<sub>0.3</sub>MnO<sub>3</sub>)/0.05 CuO composites prepared by spray drying; L Fkhar, A Mahmoud, F Boschini, A Schrijnemakers, M Hamedoun, ...*Inorganic Chemistry Communications* 119, 108129, **2020**
- ✚ Cobalt substitution effect on the structure and magnetic proprieties of Fe<sub>3</sub>O<sub>4</sub> nano-particles; L Fkhar, R Lamouri, A Nayad, M Hamedoun, A Benyoussef, ...; *Advances in Materials and Processing Technologies*, 1-7, **2020**
- ✚ M-Type SrFe<sub>12</sub>O<sub>19</sub> Ferrite: An Efficient Catalyst for the Synthesis of Amino Alcohols under Solvent-Free Conditions; M Laayati, A Hasnaoui, N Abdallah, S Oubaassine, L Fkhar, O Mounkachi, ...*Journal of Chemistry* **2020**
- ✚ 3-Acetyl-2, 5-dimethyl-1, 4-diphenylpyrrole: synthesis, X-ray structure, DFT, TDDFT studies and anti-corrosion activity; A Louroubi, A Hasnaoui, YA Aicha, N Abdallah, R Idouhli, A Benyaich, M. AIT ALI, L. El Firdoussi; *Chemical Data Collections* 32, 100662, **2021**
- ✚ Natural Hydroxyapatite: Green Catalyst for the Synthesis of Pyrroles, Inhibitors of Corrosion; A Louroubi, A Nayad, A Hasnaoui, R Idouhli, A Abouelfida, L El Firdoussi, M. AIT ALI, *Journal of Chemistry* **2021**
- ✚ Calcium Di-silicide: A potential precursor for chemical synthesis of functionalized Bi-dimensional silicon materials; A Nayad, SK Hnawi, A Hasnaoui, L El Firdoussi, M. Ait Ali, *Materials Today: Proceedings* 39, 1103-1117, **2021**
- ✚ New two-dimensional functionalised silicon nanosheets prepared by direct exfoliation of calcium disilicide with tosyl chloride; A Nayad, A Hasnaoui, L Fkhar, SK Hnawi kaotar, A Mehdi, L El Firdoussi, M Ait Ali. *Advances in Materials and Processing Technologies*, 1-11, **2021**
- ✚ Magnetic properties and magnetoresistance effect of SnFe<sub>2</sub>O<sub>4</sub> spinel nanoparticles: Experimental, ab initio and Monte Carlo simulation; O Mounkachi, L Fkhar, R Lamouri, E Salmani, M Hamedoun, H Ez-Zahraouy, EK Hlil, M Ait Ali, A Benyoussef; *Ceramics International*, **2021**
- ✚ Unsymmetrical salen nickel (II) complex embracing phenol bridge: X-ray structure, redox investigation, computational calculations, antimicrobial and catalytic activities; HA Guadouri, M Merzougui, D Hannachi, M. Ait Ali, K Ouari; *Journal of Molecular Structure*, 130809, **2021**
- ✚ Investigation of Aloe Vera Latex Used as Natural Dye in TiO<sub>2</sub>-Based Heterojunction and Liquid-Electrolyte Dye-Sensitized Solar Cells SK Hnawi, A El Mansouri, N Abdallah, A Agdad, A Tchenka, SV Cheikh, ...*Journal of Solar Energy Engineering* 144 (5), 051002, **2021**

- ✚ Enhanced magnetic properties of SrFe<sub>12</sub>O<sub>19</sub> through exchange-coupled nanocomposite  
R Lamouri, L Fkhar, O Mounkachi, A Mahmoud, F Boschini, M Hamedoun, M. Ait Ali, ...  
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- ✚ Synergistic effect of GO/SrFe<sub>12</sub>O<sub>19</sub> as magnetic hybrid nanocatalyst for regioselective  
ring-opening of epoxides with amines under eco-friendly conditions; M Laayati, AA  
Mekkaoui, L Fkhar, M. Ait Ali, H Anane, L Bahsis, ...RSC advances 12 (18), 11139, **2022**
- ✚ From amorphous red phosphorus to black phosphorus crystal: An optimization,  
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Maalam, A Benyoussef, M. Ait Ali, ..Journal of Crystal Growth 577, 126408, **2022**
- ✚ BF<sub>3</sub>@ K10: An Efficient Heterogeneous Montmorillonite Catalyst for the Halogenation of N-  
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- ✚ Enhancing Dielectric, Ferroelectric and Antibacterial Properties of Siloxene Nanosheets by Wet  
Chemical Deposition of Flower-like Spherical ZnO Nanosheets A Nayad, Y Hadouch, K Khaldoune,  
M Rafya, B Dikici, A Mehdi, M Alga, .. Silicon, 1-14, **2023**
- ✚ Recent progress on transparent and self-cleaning surfaces by superhydrophobic coatings  
deposition to optimize the cleaning process of solar panels, SN Brahim Nomeir, Sara Lakhoul,  
Sofia Boukheir, Mustapha Ait Ali  
Solar Energy Materials and Solar Cells 257, 112347, **2023**
- ✚ Carboxymethyl cellulose nanocolloids anchored Pd (0) nanoparticles (CMC@ Pd NPs):  
synthesis, characterization, and catalytic application in transfer hydrogenation  
AA Mekkaoui, H Orfi, K Bejtka, M Laayati, SA Labyad, L El Firdoussi, ... Environmental Science  
and Pollution Research 30 (34), 81619-81634, **2023**