**Activités de recherche (2020-2024) / Équipe N° 1 Pr. Belal Rachid**

#### ****Synthèse de nanoparticules, préparation et caractérisation des nanocomposites****

1. **Publications**

Efficient Hydrogen Production by steam reforming over Ni catalysts. Addition effect of La and Fe on Al2O3. M. Boudjeloud, O. Kheffache**. A. Boulahouache**, N. Salhi. Proceeding of the 2nd international symposium on materials chemistry. ISMY 2021, 16-20 May 2021. Virtual Scientific Meeting. ISBN 978-9931-9091-1-7

Photocatalytic hydrogen production over MFe2O4 (M=Ni,Co) spinel powders. M. Benlembarek, M. Trari, **A.Boulahouache**, R.Benrabaa, N.Salhi. Proceeding of the 2nd International Smposium on Materials Chemistry. ISMY 2021 Virtual Scientific Meeting, 16-20 **May 2021**. Virtual Scientific Meeting. ISBN 978-9931-9091-1-7.

M.Benlembarek, **A. Boulahouache**, M. Trari, R. Benrabaa, N. Salhi.Synthesis and characterization of NiFe2O4 for photocatalytic hydrogen production. Proceedings of the 9th Global Conference on Global Warming (GCGW-**2021**) August 1-4, 2021 Virtual conference, Croatia.[https://doi.org/10.1016/j.ijhydene.2022.10.090 0360-3199](https://doi.org/10.1016/j.ijhydene.2022.10.090%200360-3199)

M.Benlembarek, N. Salhi, R. Benrabaa, A.M. Djaballah, A. Boulahouache, M. Trari. Synthesis, physical and electrochemical properties of the spinel CoFe2O4: Application to the photocatalytic hydrogen production International Journal of Hydrogen Energy/ 2022, 47(2022)9239-9247. <https://doi.org/10.1016/j.ijhydene.2021.12.270>

Efficient preparation of 10%wt(Ni-M)/α-Al2O3(M=La,Fe) catalysts active in steam reforming of methane for hydrogen production. M.Boudjeloud, **A.Boulahouache**, R.Benrabaa, N.Salhi. Proceedings of the 9th Global Conference on Global Warming (GCGW-2021) **August** 1-4, **2021** Virtual conference, Croatia.

Physical and electrochemical features of MgFe2O4 for hydrogen production. Maroua Benlembarek, Nassima Salhi, Rafik Benrabaa, **Ali Boulahouache**, Salah Eddine Berrabah and Mohammed Trari.Proceedings of the 2nd World Energy Storage Conference: WESC-**2022**, 18-21 December, Istanbul. ISBN: 978-605-9546-19-5

M. Benlembarek,N. Salhi, R. Benrabaa , A.M. Djaballah, **A. Boulahouache**, M. Trari. Enhanced photocatalytic performance of NiFe2O4 nanoparticle spinel for hydrogen production. International Journal of Hydrogen Energy. Volume 48, Issue 24, 19 March 2023, Pages 8932-8942. [https://doi.org/10.1016/j.ijhydene.2022.10.090 0360-3199](https://doi.org/10.1016/j.ijhydene.2022.10.090%200360-3199)

Preparation, characterization and electronic properties of LaFeO3 perovskite as photocatalyst for hydrogen production.**A. Boulahouache,** M. Benlembarek, N. Salhi, A.M. Djaballah, Cherifa Rabia, M. Trari. International Journal of Hydrogen Energy [Volume 48, Issue 39](https://www.sciencedirect.com/journal/international-journal-of-hydrogen-energy/vol/48/issue/39), 5 May 2023, Pages 14650-14658 <https://doi.org/10.1016/j.ijhydene.2022.12.327>

Synthesis and characterization of LaAl0.9Fe0.1O3 perovskite: Application to oxygen photo-production. Hamza MEDJADJI, **Ali BOULAHOUACHE**, Khaled DERKAOUI, Mohamed TRARI,Nassima SALHI. Proceedings of the 2nd International Conference on Computational & Applied Physics ICCAP -2023, Blida 08-10 October **2023**. ISSN:0067-3064

Synthesis and physical, optical and electrochemical properties of LaMnO3 semiconductor perovskite oxide. **A.Boulahouache**, N.SALHI, H.Medjadji, M.Benlembarek, Khaled Derkaoui, Cherifa Rabia, M.Trari. Proceedings of 2nd International Conference on Computational & Applied Physics ICCAP -**2023**, Blida 08-10 October 2023. ISSN:0067-3064.

Novel CoFe2O4/LaAlO3 nanocomposites: An impressive photocatalyst with p-n hetero-junction for improved H2 generation under visible exposure. H. Medjadji, **A. Boulahouache**, K. Derkaoui, N. Salhi. International Journal of Hydrogen energy, October**2024**, 88:878-888.

Synthesis and characterization of LaAl0.9Fe0.1O3 perovskite: Application to oxygen photo-production. H.MEDJADJI, **A.BOULAHOUACHE**, K. Derkaoui, M.TRARI, N.SALHI, Baltica Journal, December**2024**; 190-204.<https://www.researchgate.net/publication/387223009_Synthesis_and_characterization_of_LaAl09Fe01O3_perovskite_Application_to_oxygen_photo-production>

Synthesis by Sol-Gel Route and Characterization of the Perovskite LaAlO3. Medjadji H, Benlembarek M, Salhi **N, BoulahouacheA**, Berrabah SE, Trari M. December **2024**.<http://dx.doi.org/10.2139/ssrn.5052259>

1. **Communications**

**a. Internationales**

Photocatalytic hydrogen production over MFe2O4 (M=Ni, Co) spinel powders.MarouaBenlembarek, Mohamed Trari, **Ali Boulahouache**, Rafik Benrabaa, Nassima Salhi. 2nd International Symposium on Materials Chemistry, ISyMC’2021, Boumerdes16-20 **Mai/ 2021**<https://isymc2020.wixsite.com/umbb><https://isymc.sciencesconf.org/>

Efficient Hydrogen Production by steam reforming over Ni catalysts. Addition effect of La and Fe on Al2O3. M. Boudjeloud, O. Kheffache. **A. Boulahouache**, N. Salhi. 2nd international symposium on materials chemistry. ISMY2021, Virtual Scientific Meeting, Boumerdes **16-20 May 2021**.<https://isymc.sciencesconf.org/>

Synthesis and characterization of NiFe2O4 for photocatalytic hydrogen production**.** M.Benlembarek, **A. Boulahouache**, M. Trari, R. Benrabaa, N. Salhi**.** 9th Global Conference on Global Warming GCGW 1-4 Août**2021** Virtual conference**.** <http://www.gcgw.org/gcgw2021/>

Partial substitution of nickel by lanthanum or iron over Ni/α-Al2O3 catalyst for hydrogen production at low temperature in methane steam reforming. M.Boudjeloud, **A.Boulahouache**, R.Benrabaa, N. Salhi. 9th Global Conference on Global Warming GCGW 1-4 Août**2021** Virtual conference.<http://www.gcgw.org/gcgw2021/>

Preparation and Characterizations of MgFe2O4 Spinel semiconductor. M. Benlembarek, **A. Boulahouache**, M.Trari, R. Benrabaa, N. Salhi. 1st International Conference on Computational & Applied Physics- ICCAP, Blida 26-28 **Septembre 2021**.<https://www.univ-blida.dz/iccap2021/> DOI: 10.21467/abstracts.122

Visible light induced hydrogen evolution on Co-Fe spinel powder. M. Benlembarek, N. Salhi, R. Benrabaa, **A. boulahouache**, M. Trari**.** The 3rd International Conference on Advanced Engineering in Petrochemical Industry (ICAEPI’21)November 30th - **December 2nd, 2021**.http://ftech.univ-skikda.dz/ICAEPI2021.

Synthesis and characterization of the spinel CoFe2O4 and its application as photocatalyst for H2 evolution under visible light irradiation. Maroua Benlembarek, Mohamed Trari, **Ali Boulahouache**, Rafik Benrabaa, Nassima Salhi. The first International Seminar on Materials Synthesis and Environmental Monitoring, ISMSEM, Ouargla 7-9 **Février 2022.**<https://ismsem2022.sciencesconf.org/>.

Nanostructured Spinel-ferrite MFe2O4 (M = Co, Ni, Mg) Photocatalysts: Application in Hydrogen Production. M. Benlembarek, R. Benrabaa, N. Salhi, **A. Boulahouache**, M. Trari.1ère Conférence Internationale sur la Technologie de la Catalyse dans l’Industrie Pétrolière et Gazière - 1ère CITCIPG. Oran 29-30 **mars 2022**

Physical properties of a ternary LaNiO3 perovskite oxide as photocatalyst for hydrogen production. **A. Boulahouache**, N. SALHI, M. Benlembarek, M. Trari., C.Rabia.1ère Conférence Internationale sur la Technologie de la Catalyse dans l’Industrie Pétrolière et Gazière - 1ère CITCIPG. Oran 29-30 **mars 2022**

Physical and electrochemical features of MgFe2O4 for hydrogen production**.** Maroua Benlembarek, Nassima Salhi, Rafik Benrabaa, **Ali Boulahouache**, Salah Eddine Berrabah and Mohammed Trari**.** The 2nd World Energy Storage Conference: WESC-**2022**, 18-21 **December**, Istanbul**[. https://wesc2022conference.com](C:\\Users\\USER\\Desktop\\Nassima\\. https:\\wesc2022conference.com)**

International Conference and Exhibition for Science (ICES2023) College of Science, King Saud University, Riyadh, Saudi Arabia. **February 06-08, 2023**. «Synthesis and characterization of the Complexes of types Schiff Bases» **EL MAHDI Ibissem et BELAL Rachid**.

International Conference and Exhibition for Science (ICES2023) College of Science, King Saud University, Riyadh, Saudi Arabia**. February06-08, 2023**. «Synthesis and characterization of binuclear Copper (II) complex Schiff base» **EL MAHDI Ibissem et BELAL Rachid**.

Synthesis and characterization of LaAl0.9Fe0.1O3 perovskite: Application to oxygen photo-production. Hamza MEDJADJI, **Ali BOULAHOUACHE**, Khaled DERKAOUI, Mohamed TRARI, Nassima SALHI. 2nd International Conference on Computational & Applied Physics ICCAP -2023, Blida **08-10October 2023**. <https://www.univ-blida.dz/iccap-Blida1>

Synthesis and physical, optical and electrochemical properties of LaMnO3 semiconductor perovskite oxide.**A.Boulahouache**, **N.SALHI**, H.Medjadji, M.Benlembarek, Khaled Derkaoui, Cherifa Rabia, M.Trari. 2nd International Conference on Computational & Applied Physics ICCAP -2023, Blida **08-10October 2023.**[**https://www.univ-blida.dz/iccap-Blida1**](https://www.univ-blida.dz/iccap-Blida1)

Degradation of Methyl Orange by LaAl0.9 Fe0.1O3 nano-perovskite.Hamza MEDJADJI, **Ali BOULAHOUACHE**, Nassima SALHI. International Conference on Environment Technologies and Sustainable Energy,Sidi Fredj **17-18 October 2023. https://icetse.crapc.dz/**

CoFe2O4/LaAlO3 heterojunction for efficient photocatalytic hydrogen evolution.Hamza MEDJADJI, Nassima SALHI, Maroua BENLEMBAREK,**Ali BOULAHOUACHE**, Mohamed TRARI.The 2nd Edition International Conference on Oil, Gas, and Petroleum Engineering, Boston, USA **26-28 October 2023.** <https://kindcongress.com/event/2nd-edition-of-international-conference-on-oil-gas-and-petroleum-engineering-iogp-2023/>

Study of doped Ca0.9Mg0.1Fe2O4 nano-spinel for hydrogen production via photocatalytic water splitting under visible light irradiation.Hamza MEDJADJI, **Ali BOULAHOUACHE**, Mohamed TRARI, Nachida BENSEMMANE, Nassima SALHI.The 3rd edition of the international conference on Energy, materials and Environment ICEME2024, Université de Khemis Meliana **06-07 Mai 2024.**<http://www.univ-dbkm.dz/?p=8862&lang=en>

Synthesis and characterizations of CaFe2O4 spinel as photocatalyst for hydrogen production Hamza MEDJADJI, **Ali BOULAHOUACHE**, Nassima SALHI, Mohamed TRARI. 2nd International Congress On Energy and Industrial Processes Engineering ICEIPE’24, Alger **14-16 Mai 2024.** [**www.iceipe-usthb-dz.com**](http://www.iceipe-usthb-dz.com)

The 3rd edition of the international conference on materials science and engineering and their impact on the environment, **May 29-30th2024**, Sidi Bel Abbès-Algeria. Photocatalytic hydrogen production over MFe2O4 (M=Ca, Cu) nano-spinel powders under visible light irradiation. Hamza MEDJADJI, **Ali BOULAHOUACHE**, Khaled DERKAOUI, S.E. BERRBAH, Mohamed TRARI, Nachida BENSEMMANE, Nassima SALHI**.**[**https://univ-sba.dz/lpcma/icmse2024/index.html**](https://univ-sba.dz/lpcma/icmse2024/index.html)

1st International Symposium of African Sustainable Energy Solutions.Study of p-n CaFe2O4/LaAlO3 heterojunctions for hydrogen production by photocatalytic water splitting process under visible light. Hamza MEDJADJI, **Ali BOULAHOUACHE**, Nachida BENSEMMANE, Mohamed TRARI, Nassima SALHI. South Africa**, 25-28 Aug 2024**.

The 1st International Seminar on medicinalchemistry and green chemistry (1st IS MCGC -Annaba 2024), **13-14 november2024**, Annaba. Synthesis and EnhancedPhotocatalytic Performance of CoAl₂O₄ Nano-sheets: Structural Characterization and Degradation of OrganicPollutantunder Visible Light. Nachida BENSEMMANE, Hamza MEDJADJI,**Ali BOULAHOUACHE**,Nassima SALHI**.**

The first International Conference on Chemistry Science, Materials Design and their applications. ICCSM’**2024November 18-20**, Chlef. Synthesis and EnhancedPhotocatalytic Performance of LaCo1-xAlxO3 (x=0,2) Semiconductor: Structural Characterization and Degradation of OrganicPollutantunder Visible Light. Nachida BENSEMMANE, Hamza MEDJADJI, **Ali BOULAHOUACHE**, Nassima SALHI**.**

**b. Nationales**

Maroua BENLEMBAREk, Nassima SALHI, Rafik BENRABA, **Ali BOULAHOUACHE**, Mohamed TRARI. Facile synthesis of spinel oxide nano-catalysts for photocatalytic H2evolution. 1er Séminaire National des Sciences du Génie des Procédés : Applications et Innovations "SSGP'22” Alger le **14-15 Décembre 2022.**[www.fgmgp.usthb.dz/ssgp22/](http://www.fgmgp.usthb.dz/ssgp22/)

Hamza MEDJADJI, Maroua BENLEMBAREK, **Ali BOULAHOUACHE**, Mohamed TRARI, Nassima SALHI. Synthesis and characterization of LaAlO3nanopowde by sol-gel method. Scientific and Education day of the Faculty of chemistry, USTHB 18 Avril 2023. <https://jspfch2023.wixsite.com/jspfch23>

Hamza MEDJADJI, **Ali BOULAHOUACHE**, Nassima SALHI. Synthesis and characterization of LaAl0.9Fe0.1O3 via sol-gel method. The First National Seminar on Chemistry FNSC’2023, Chlef 03-04 October 2023. <https://www.univ-chlef.dz/FNSC1>

Hamza MEDJADJI, **Ali BOULAHOUACHE**, Nassima SALHI. Effect of doping on the physical and optical properties of LaAlO3 nanoparticles. The Second National Seminar on Chemistry and its Applications (SNCA-2-2023) Batna 29-30th November 2023. <https://labo.univ-batna.dz/lcmvar/>

National Seminar on Nanomaterials: synthesis and applications, **June 2024**, Université de Boumerdess, Algérie, Synthesis and characterization of calcium ferrite CaFe2O4 by nitrate route. Hamza MEDJADJI, Maroua BENLEMBAREK, **Ali BOULAHOUACHE**, Nassima SALHI, Nachida BENSEMMANE, Mohamed TRARI.

1. **Chapter Book**

I. Sebai, R. Baghtache, **A. Boulahouache**, N. Salhi, M. Trari. Book Chapter in Advances in Renewable Hydrogen and Other Sustainable Energy Carriers, Springer, Abdallah Khellaf, Editor, 2020, pages: 331-337.

1. **Projets PRFU**

Année d’agrément 2019. Préparation et étude de propriétés de matériaux en vue d’applications au domaine énergétique durable. Chef de projet : SALHI Nassima. Nombre de chercheurs/doctorants impliqués : 06. Observation : Bilan positif.

1. **Encadrements**

**a Doctorat en Science soutenu**

Préparation, caractérisation des pérovskites. Application dans la production de l’hydrogène soutenu le 20.07.2023 par BOULAHOUACHE Ali, à l’USTHB.

**B Masters soutenus**

Préparation et caractérisation de matériaux oxydes type pérovskites à base de nickel d'alcalino-terreux, soutenu par Said Selma et Boukhtachi Faiza, soutenu le 19.10.2020, Départementde chimie,U. Blida1.**BOULAHOUACHE. A et** SALHI. N

BouabdallahCharrazed-GuerrabenRachda, soutenu le19/10/2020, Université Blida 1. « Synthèse et caractérisations d’oxydes à structure définie type pérovskites ».**Encadré par** SALHI. N **et BOULAHOUACHE.A**

Mémoire de master II option : Ecosystèmes Aquatiques. Les étudiantes : Temamra Aya ; Salhi Sanaa et Selmane Djamila. Thème : « Etude des paramètres physico-chimiques et bactériologique des eaux de barrage de Sidi M’Hamed Ben Taïba (Wilaya d’Ain Defla) ». 2020. **Mme EL MAHDI Ibissem**

Mémoire de master II option : Biochimie. Les étudiantes : OuarguiWafiya ; El hef Meriem et Fenniche Feriel. Thème : « Intérêt de frottis sanguin dans le diagnostic de leucémie lymphoïde chronique LLC ». 2020. **EL MAHDI Ibissem**

Préparation et caractérisations de photocatalyseur pour la production d'hydrogène à partir de l'eau, soutenu le 14.09.2021 par Berdja Sonia et Zemmourit Manel, Départementde chimie,U. Blida1. SALHI. N **et A. BOULAHOUACHE**

Mémoire de master II option : Ecosystèmes Aquatiques. Les étudiantes : Hadj benabdelmoulaSylia ; Hadj ahmed Imane et Tchambaz Assia. Thème : « Controle de qualité physic-chimique et bactériologique des eaux de sources du parc national de Chréa ». 2021. **EL MAHDI Ibissem**

Mémoire de master II option : Biochimie. Les étudiantes : Messaoud Fatma Zohra et BennacefImene. Thème : « Etude des variations des paramètres biochimiques chez les patients atteints une insuffisance rénale chronique terminal avant et après hémodialyse ». 2021. **EL MAHDI Ibissem**

First principlesstudy on a multiferroicmaterial: Bismuth Ferrite BiFeO3, soutenu le 22.9.2021 par HamaidiCherine, Département de chimie, U. Blida1. SALHI. N **et A. BOULAHOUACHE**

Synthèse et caractérisation d'un d'oxyde mixte à base de lanthane et de manganèse, soutenu le 03.07.2022 par Belabed Ahlem et Bouhaya Nesrine, Département de chimie, U. Blida1. **BOULAHOUACHE. A et** SALHI. N

Preparation and characterization of a mixed oxide based on iron, soutenu le 13.07.2022 par Aya Hammoudi, Département de chimie, U. Blida1. SALHI. N **et A. BOULAHOUACHE**

Mémoire de master II option : Ecosystèmes Aquatiques. Les étudiantes : Hammadi Asma et FerhoulNadjet. Thème : « Evaluation de la qualité physico-chimique et bactériologique des eaux de forage de l’entreprise AQUASIM MOUZAIA ». 2022. **EL MAHDI Ibissem**

Mémoire de master II option : Biochimie. Les étudiantes : Abaziz Yamina et ZerroukhatNihad. Thème : « Contrôle de la qualité d’un médicament non obligatoirement stériles sous forme d’ampoules ENERMAG® 1.5 g (DCI/ pidolate de magnésium) ». 2022. **EL MAHDI Ibissem**

Mémoire de master II option : Ecosystèmes Aquatiques. Les étudiantes : Achour Rayane, Bahabi Yasmine et Mebarki Yousra. Thème : « Evaluation des caractéristiques physico-chimiques et bactériologiques des eaux de la station d’épuration de Beni Mered (Wilaya de Blida) ». 2023.**EL MAHDI Ibissem**

Mémoire de master II option : Biochimie. Les étudiantes : Laribi Bouchra et Bergoug Hasna. Thème : « Extraction, propriétés physico-chimiques et l’effet biologique de l’huile essentielle de Salvia officinalis L (la sauge officinal) ». 2023.**EL MAHDI Ibissem**

Mémoire Master II, Filière : Hydrobiologie Marine et Continentale Option : Écosystèmes Aquatiques. Les étudiants : Amara Taha Sief Eddine et Agoulmine Rachid.Thème : « Etude des paramètres physico-chimiques et bactériologiques des eaux usées de la station d’épuration de Beni Mered (Wilaya de Blida) ». 2024.**EL MAHDI Ibissem**