Dr. BENHSINA Elhassan

Department of Low-dimensional Systems
J. Heyrovsky Institute of Physical Chemistry
182 00 Praha 8, czech republic
Tel : + 420 778 503 372
Email **:** **h.benhsina@gmail.com / elhassan.benhsina@jh-inst.cas.cz**

Researcher in Materials Science

Research topic: Design and synthesis of new materials and their application in different fundamental aspects for energy storage, heterogeneous catalysis, electrochemical sensing, and environmental protection.

Professional Experience

- ***August 2022*** until now : Postdoctoral at the Department of Low-dimensional Systems, 'preparation of new Metal-organic Frameworks / Covalent Organic Frameworks, and study of their applications in various fields';
- **December 2017 –2020** : Contract teacher at chemistry department, Faculty of Science, Mohammed V University in Rabat, Morocco (teaching, tutorials in chemistry, co-supervision and participation in organization).
- **December 2016 –2020 :** Responsible for a store of chemical products at the chemistry department, Faculty of Science, Mohammed V University in Rabat, Morocco.
- **Mars-Jun 2014 :** Training at the National Center for Energy, Nuclear Sciences and Techniques, Department of Instrumentation and Industrial Applications, Rabat, Morocco.
- **Since 2015 :** Contribution to supervision of bachelor and master project internship's.

Education

December *2020* **PhD in Materials Science**, Mohammed V University, Faculty of Science, Rabat, Morocco.

Thesis title : *Synthesis and structural study of new vanadates and phosphates : $A_2Mn_2M(VO_4)_3$ (A = Na, Ag ; M = Fe, Cr) ; $A_2Mn_2Cr(PO_4)_3$ (A = Na, Ag) ; $AMn_2V_3O_{10}$ (A = Na, Ag) and $ACuIn(PO_4)_2$ (A = Na, K) : Catalytic, electrochemical and magnetic properties.*

July *2014* **Master Degree, in Inorganic Chemistry 'Inorganic, Industrial Materials and Mineral Resources'**, Mohammed V University, Faculty of Science, Rabat, Morocco ;

June ***2012*** **Bachelor Degree, in fundamental Chemistry Science, «Molecular Chemistry and Materials»**, Ibn Zohr University, Faculty of science, Agadir, Morocco ;

June ***2009*** **Baccalaureate degree, in experimental science**, Ibn Tachafin High school, Mireleft, Agadir, Morocco.

Scientific conferences

10-13 December 2019, ***International conference on advanced materials, nanosciences and applications & training school in spectroscopies for environment and nanochemistry***: *Synthesis of $Na_2Mn_2Fe(VO_4)_3$ compound, its structural and magnetic propriety*

12-13 November 2018, ***International conference for research on phosphate and derivatives,*** *Synthesis and crystal structural of a new alluaudite-like phosphate $Na_2Mn_2Cr(PO_4)_3$: magnetic and electrochemical behaviors.*

27 June 2018, National workshop, «Protection and enhancement of coastal and marine areas».

18-20 July 2018, ***National days of PhD student doctorant and youth researchers***: Development of new $Na_2Mn_2Fe(VO_4)_3$, its structural and magnetic proprieties.

3-7 July 2017, 9th Pan African congress of mathematicians.

21-24 November 2017, ***2nd International Congress on Materials and Structural Stability***: *Synthesis and structure study of new manganese and indium based phosphate: $(Ca, Ba)_{1.222}Mn_{0.923}In_{1.923}(PO_4)_3$.*

22-25 November 2016, Moroccan School of Crystallography (EMC6), Faculty of science Meknès, Maroc. Academy of science and technic, Rabat, Maroc.

13-17 September 2015, ***The 8th International Symposium on Inorganic Phosphates and The 4th International Symposium for the Innovation of Applied Materials to Optics and Electronics, Faculty of Science, Agadir, Morocco,*** Synthesis and characterization of new indium based phosphate: $(Ca,Ba)_{1.222}Mn_{0.923}In_{1.923}(PO_4)_3$ with alluaudite like structure.

22-24 April 2015, Crystallography for the next generation : the legacy of IyCR, Hassan II

19-21 February 2015, 4th Edition 'the theme Employability, Business Creation and Training through Research', Mohammed V University, Faculty of science, Rabat, Morocco.

Research Skills and Topics

- Design and Preparation of new materials;
- Controlling the growth of nano-sized materials;
- Development of semiconductor-based materials for applications in photovoltaic; photocatalytic degradation of organic pollutants;
- Synthesis of new materials containing sodium, and its coating for electrochemical testing as cathode materials;
- Prepartion thin films via electrochemical and spry methodes;

- Characterization of the materials by different technics (FTIR, SEM, XRD, TEM, NMR, XPS, HPLC, TGA, RAMAN);
- Structural resolution using Data of single crystal or powder X-ray diffraction;
- Investigation of physical insight using DFT approach.

Publications

- **Elhassan Benhsina**, Fatiha Ouanji, Abderrazak Assani, Mohamed Saadi, Mohammed Kacimi, Lahcen El Ammari, Synthesis, characterization and catalytic activity of $Ag_2Mn_2Fe(PO_4)_3$ with Alluaudite-like structure, *Materials Today: Proceedings* "accepted"
- Khaoula Abbi, Lina Hermouche, Youssra El Hamdouni, Maryem Rahmani, **Elhassan Benhsina**, Najoua Labjar, Abdelmajid Skalli, Mohammed El Mahi, El Mostapha Lotfi, Mohamed Dalimi &Souad El Hajjaji, A novel carbon paste electrode modified with Argan oil cake waste / zinc oxide nanoparticles composite for methylene blue detection, *International Journal of Environmental Analytical Chemistry* 2022, Doi : https://doi.org/10.1080/03067319.2022.2036982
- **Elhassan benhsina**, Lina Hermouche, Abderrazzak Assani, Mohamed Saadi, Najoua Labjar, Souad EL Hajjaji, Abdelilah Lahmar, Lahcen El Ammari, Synthesis, characterization, magnetic properties and Lead sensing based on a new alluaudite-like phosphate $Na_2Mn_2Cr(PO_4)_3$, *Journal of Materials Science*, Doi :10.1007/s10853-020-05371-2 (2021).
- Khaoula Abbi, Lina Hermouche, Youssra El Hamdouni, Maryem Rahmani, **Elhassan Benhsina**, Najoua Labjar, Abdelmajid Skalli, Mohammed El Mahi, El Mostapha Lotfi, Mohamed Dalimi & Souad El Hajjaji, International Journal of Environmental Analytical Chemistry, (2022) DOI: 10.1080/03067319.2022.2036982.
- ***Elhassan Benhsina***, Mustapha Beraich, Zakaria Hafidi, Abderrazzak Assani, Mohamed Saadi, Lahcen El Ammari, Synthesis, structural, optical insight and DFT investigation of $NaMn_2V_3O_{10}$, *Materials Letters*, 128079 (2020).
- ***Elhassan Benhsina***, Jamal Khmiyas, Said Ouaatta, Abderrazzak Assani, Mohamed Saadi and Lahcen El Ammari, Synthesis and crystal structure of $NaCuIn(PO_4)_2$, *Acta Cryst*. E76, 366–369 (2020).
- ***Elhassan Benhsina***, Abderrazzak Assani, Mohamed Saadi, Abdelilah Lahmar & Lahcen El Ammari, A new sodium- and manganese-based trivanadate $NaMn_2V_3O_{10}$: synthesis, structural and magnetic insights, *Monatshefte für Chemie - Chemical Monthly*, 151, 677–684 (2020).
- Jamal Khmiyas, ***Elhassan Benhsina***, Said Ouaatta, Abderrazzak Assani, Mohamed Saadi and Lahcen El Ammari, Crystal structure of silver strontium copper orthophosphate, $AgSr_4Cu_{4.5}(PO_4)_6$, *Acta Cryst*., E76, 186–191 (2020).
- ***Elhassan Benhsina***, Fatiha Ouanji, Abderrazak Assani, Mohamed Saadi, Mohammed Kacimi, Lahcen El Ammari, Synthesis of silver manganese tri-vanadate $AgMn_2V_3O_{10}$ and its catalytic activity on the conversion of para-nitrophenol to para-aminophenol, *Inorganic Chemistry Communications*, 117, 107979 (2020).
- M. Beraich, H. Shaili, ***E. Benhsina***, Z. Hafidi, S. Mansouri, M. Taibi, F. Bentiss, A. Guenbour, A. Bellaouchou, A. Mzerd, A. Zarrouk, M. Fahoume, Preparation and characterization of Cu_2FeGeS_4 thin-film synthesized via spray ultrasonic method− DFT study, *Materials Letters*, 128070, (2020).

- M.Beraich, H. Shaili, ***E. Benhsina***, Z. Hafidi, M. Taibi, F. Bentiss, A. Guenbour, A. Bellaouchou, A. Mzerd, A. Zarrouk, M. Fahoume, Experimental and Theoretical study of new kesterite Cu_2NiGeS_4 thin film synthesized via spray ultrasonic technic, *Applied Surface Science*, 146800, (2020).
- M.Beraich, H. Shaili, ***E. Benhsina***, Z. Hafidi, A. Elhat, M. Taibi, F. Bentiss, A. Guenbour, A. Bellaouchou, S. Mansouri, A. Mzerd, A. Zarrouk, M. Fahoume, Structural, electronic and optical properties of a tetragonal-stannite Cu_2CoGeS_4 thin film synthesized by a low-cost spray method: Experimental and theoretical study, *Ceramics International* (2020)
- ***Elhassan Benhsina***, Abderrazzak Assani, Mohamed Saadi and Lahcen El Ammari, Synthesis and structure study of new manganese and indium based phosphate: $(Ca,Ba)_{1.222}Mn_{0.923}In_{1.570}(PO_4)_3$, *MATEC Web of Conferences* 149, 01085 (2018).
- Yousra Sabri, Oumayma Mlida, Mohamed Youssef Messous, Mounia Tahri, Ben Ali Abdelkader, Alami Talbi Mohammed, Mohammed Saadi, ***Elhassan Benhsina***, Synthesis and Characterization of the Structural Material $La_{(1-x)}Mg_xMn_{0.98}Fe_{0.02}O_3$ Perovskite for Energy Storage, *IEEE*, 19572542 (2019).
- ***Elhassan Benhsina***, Abderrazzak Assani, Mohamed Saadi and Lahcen El Ammari, Crystal structure of $(Na_{0.70})(Na_{0.70},Mn_{0.30})(Fe^{3+},Fe^{2+})_2Fe^{2+}(VO_4)_3$, a sodium-, iron- and manganese based vanadate with the alluaudite-type structure, *Acta Cryst*, E72, 220-222 (2016).

Languages

- ✓ English: Advanced
- ✓ German: Intermediate
- ✓ Frensh: Advanced
- ✓ Arabic: Fluent
- ✓ Tamazight: mother tongue

Computer skills

- **Operating Systems :** Windows, MacOS, Linux.
- **Office software :** OpenOffice, Microsoft Office (*Word, PowerPoint, Excel*)
- **Ab initio codes :** Wien2k, PWSCF (Quantum-Espresso), Gaussian

Others activities

 Active participation in international conferences and symposiums.

 Technical assistance of the X-ray diffractometer for the recording and interpretation of X-ray diffractograms.

 Sport, reading, personal development.

 Associative participation
- Membership in the association of young researchers in the Faculty of Science-Rabat
- Membership in the Moroccan social Renaissance for non-profit associations