LAHCEN BIH

ENSAM Meknes, University Moulay Ismail, Morocco

CV/Scientific qualifications

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H-index 20, https://scholar.google.com/citations?user=g-W25m4AAAAJ&hl=fr&oi=ao

59 years old,
Moroccan Married,
two children
Professional address: ENSAM Meknes,
Marjane 2, BP 15290 Al Mansour, Mekens.
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Personal address : Res. Fadwa, B7, Av. FAR,
N.V.,Meknes.

1. Higher education degree(s) (year, subject area):

*** C. E. A. in Inorganic Chemistry 1992**.
University Allal ben Abdellah, Fes, Morocco.
The title of my thesis was: Research of new molybdenum phosphates in glassy form.
*** Licence Es - Sciences Physiques 1990**, option "Chemistry"
University of Moulay Ismaïl, Meknès, Morocco.
*** D. E. U. G. 1988** option "Physics and Chemistry"
University of Moulay Ismaïl, Meknès, Morocco.
*** Baccalaureat 1986** " Experimental Sciences ", Errachidia, Morocco.

2. Doctoral degree (year, discipline/subject area, dissertation title).

*** State Doctorate (PhD) in solid state chemistry, Materials Sciences, 2001,** the title of my thesis was: Studies of phosphate glasses containing transition metal oxides: synthesis, structure and electrical properties. University of Moulay Ismaïl, Meknès, Morocco.
*** Doctorate in Inorganic Chemistry, Materials Sciences "Doctorate of 3rd cycle" 1994**
The title of my doctorate was: Phosphate glasses within the A_2O-A_2XO_4-P_2O_5 (A= Li, Na; X=Mo, W) systems: elaboration, structural, magnetic, and electrical studies. Université Moulay Ismaïl, Meknès, Morocco.

3. Qualifications as research fellow/associate professor.

***** Dielectric Materials for energy storage: Processing and Characterization.
***** Solid electrolytes: Elaboration, characterization, and applications.
* Techniques: UV-visible, Magnetism, EPR, NMR, EXAFS, SEM, XRD, DTA and DSC.
* Electrical properties and modelisation.
* Dielectric properties and modelisation.

4. Current position, period of appointment, share of time spent in research.

* Current position: **Professor, permanent position**, starting date: **2004**.

Scientific publications (2016-2021)

1. L. Ouachouo, H. Es-soufi, M. I. Sayyed, L. Bih, (2023). Effect of tungsten metal-oxide addition on .1 physical, structural, and electrical properties of borophosphate glasses. Ceramics International. 49 (2023)28550- 28592.

2. Es-soufi, H., Ouachouo, L., Sayyed, M. I., Hashim, S., Bih, H., & Bih, L. (2023). Synthesis and investigation of the physical, structural, and radiation shielding properties of the titano-bismuth phosphate glasses. Journal of Materials Science: Materials in Electronics, 34(12), 1040. https://doi.org/10.1007/s10854-023-10479-7 (2023)
3. Thabit, H. A., Abd Khamim I., Es-soufi, H., Abdulmalik, D. A., Al-Fakih, A. M., Alraddadi, S., & Sayyed, M. I. (2023). Structural, thermal, and mechanical investigation of telluro-borate-Bismuth glass for radiation shielding. Journal of Materials Research and Technology. https://doi.org/10.1016/j.jmrt.2023.04.082 (2023)
4. Es-soufi, H., Sayyed, M. I., Almuqrin, A. H., Rajesh, R., Lima, A. R. F., Bih, H., & Bih, L. (2023). Crystallographic, Structural, and Electrical Properties of W^{6+} Substituted with Mo^{6+} in Crystalline Phases such as TTB Structure. Crystals, 13(3), 483. https://doi.org/10.3390/cryst13030483
5. Es-soufi, H., Ouaha, A., Sayyed, M. I., Bih, H., & Bih, L. (2023). Impact of Nb_2O_5 on radiation shielding properties of the bismuth-titanium-phosphate glasses. Optik, 170511. https://doi.org/10.1016/j.ijleo.2023.170511
6. Es-soufi, H., Bih, H., Sayyed, M. I., & Bih, L. (2023). Impact of TiO_2 on physical, optical, and radiation shielding properties of tungsten-based glasses. Optik, *272*, 170400. https://doi.org/10.1016/j.ijleo.2022.170400
7. Abdelhak Chouiekh, Abdellah Tahiri, Nour El Hoda Noue El Hoda Bouftila , Aziz Nfissi, Lahcen Bih, Abdessamad Faik, Tajdine Lamcharfi, Yahya Ababou, Abdelilah Rjeb, Mohamed Naji, Experimental and DFT analysis of structural, optical, and electrical properties of Li3xLa2/3-xTiO3 (3x = 0.1, 0.3 and 0.5) solid electrolyte, Ceramics International (2023) https://doi.org/10.1016/j.ceramint.2023.05.141 (2023)
8. A. Ihyadn, S. Merselmiz, D. Mezzane, L. Bih, A. Lahmar, A. Alimoussa, M. Amjoud, Igor A. Luk'yanchuk & M. El Marssi, Dielectric and energy storage properties of Ba0.85Ca0.15Zr0.1Ti0.90O3 ceramics with BaO–Na2O–Nb2O5–WO3–P2O5 glass addition, Journal of Materials Science: Materials in Electronics volume 34, Article number: 1051 (2023).
9. Es-soufi, H., Bih, H., Bih, L., Rajesh, R., Lima, A. R. F., Sayyed, M. I., & Mezher, R. (2022). Rietveld Refinement, Structural Characterization, and Methylene Blue Adsorption of the New Compound Ba0. 54Na0. 46Nb1. 29W0. 37O5. Crystals, *12*(12), 1695, https://doi.org/10.3390/cryst12121695
10. H. Es-soufi, L. Bih, Alan R.F. Lina, A. El Bouari, B. Manoun, S. Hussain, Journal of Materials Science: Materials in Electronics (2021), https://doi.org/10.1007/s10854-021-06804-7, Investigation DSC and XRD on the crystallization kinetics in the phosphate Li2O–Li2WO4–TiO2–P2O5 glassy ionic system
11. Chchiyai, Z., El Bachraoui, F., Tamraoui, Y., Alami, J., Manoun, B., Design, structural evolution, optical, electrical and dielectric properties of perovskite ceramics Ba1-xBixTi1-xFexO3 ($0 \leq x \leq 0.8$) Materials Chemistry and Physics, 2021, 10.1016/j.matchemphys.2021.125096, 125096.
12. Y.S. Rammah, F.I. El-Agawany, E. Haily, L. Bih, E.M. Ahmed, K. Mahmoud, Extensive study of the optical, mechanical properties, and gamma photon shielding effectiveness of potassium titanate biso-phosphate glasses, Journal of Materials Science: Materials in Electronics volume 32, pages18145–18162 (2021)
13. L. Ouachouo, L. Bih, E. Haily,M. Jerroudi, I. Saadoune, Impedance spectroscopy studies of the chlorophosphate glasses, Materials Today Procceding, 10.1016/j.matpr.2021.06.041 (2021).
14. M. Jerroudi, L. Bih, E. Haily, I. Saadoune, Impedance spectroscopy of manganese-doped mixed alkali phosphate glasses, Materials Today Procceding, 10.1016/j.matpr.2021.03.467.

15. A. Ihyadn, D. Mezzane, M. Amjoud, A. Lahmar, L. Bih, A. Alimoussa, I A Luk'yanchuk, M. El Marssi, Effect of the BaO-Na2 O-Nb2O5 -P2O5 glass addition on microstructure and dielectric properties of BNN ceramics, Materials Today Procceding, 10.1016/j.matpr.2021.03.570
16. M. Jerroudi, L. Bih, M. Haddad, I. Saadoune, Optical absorption study of manganese-doped Na 2 O-K 2 O-P 2 O 5 glasses, IOP Conference Series Materials Science and Engineering 1160(1):012008
17. E. Haily, L. Bih, M. Jerroudi, A. El Bouari, Optical properties and frequency-dependent conductivity of K2O-BaO-TiO2-P2O5 glasses, Materials Today Procceding, 10.1016/j.matpr.2021.06.082
18. Ettakni, M., Kassou, S., Ghyati, M. Ouakka, S., Yousfi, M. Khechoubi, L.Bih, H. Bih, Khmou, A. Optical and dielectric properties of metal halide perovskites 2D Bulletin of Materials Science, 2021, 44(2), 113.
19. Jerroudi, M., Bih, L., Yousfi, S., Manoun, B., Lazor, P. Structure-property correlations in lithium zinc cobalt metaphosphate glasses and glass-ceramics Physica B: Condensed Matter, 2021, 610, 412949.
20. Benyounoussy, S., Bih, L., Muñoz, F., Rubio-Marcos, F., EL Bouari, A. Effect of the $Na_2O–Nb_2O_5–P_2O_5$ glass additive on the structure, dielectric and energy storage performances of sodium niobate ceramics. Heliyon, 2021, 7(5), e07113
21. Es-soufi, H., Bih, L. Effect of TiO_2 on the chemical durability and optical properties of Mo-based phosphate glasses. Journal of Non-Crystalline Solids, 2021, 558, 120655.
22. Chchiyai, Z., El Bachraoui, F., Tamraoui, Y., Bih, L., Lahmar, A., Faik, A., Alami, J., Manoun, B. Synthesis, structural refinement and physical properties of novel perovskite ceramics $Ba_{1-x}Bi_xTi_{1-x}Mn_xO_3$ (x = 0.3 and 0.4) Materials Chemistry and Physics, 2021, 262, 124302.
23. Benyounoussy, S., Bih, L., Muñoz, F., Rubio-Marcos, F.,Naji, M., El Bouari, A. Structure, dielectric, and energy storage behaviors of the lossy glass-ceramics obtained from Na_2O-Nb_2O_5-P_2O_5 glassy-system. Phase Transitions, 2021, 94 (8) 634-650.
24. E. Haily, L. Bih, A. El bouari, A. Lahmar, M. Elmarssi, and B. Manoun, Structural, optical, and dielectric properties of Bi_2O_3-K_2O-TiO_2-P_2O_5 glasses and related glass-ceramics, Phase Transitions (2020) https://doi.org/10.1080/01411594.2020.1837369.
25. E Haily, L Bih, A El Bouari, A Lahmar, M El Marssi, B Manoun, Structural, optical, and dielectric properties of the BaO–TiO 2–P 2 O 5 glasses, Journal of the Australian Ceramic Society, (2020) 1-13. https://doi.org/10.1007/s41779-020-00473-1
26. Kaiba, A.; Geesi, Mohammed H.; Guionneau, P.; Aljohani, Talal A.; Bih, L.; Bih, H.; Kassou, S., Synthesis, structural and Raman spectroscopic in organic-inorganic halide perovskites based on beta-Alanine, Journal of Molecular Structure 1204 (2020) 127380.
27. E. Haily, L. Bih, A. El bouari, A. Lahmar, M. Elmarssi, and B. Manoun, Effect of BaO-Bi_2O_3-P_2O_5 glass additive on structural, dielectric and energy storage properties of $BaTiO_3$ ceramics, Mater. Chem. Phys., 241(2020) 122434
28. El Hachmi, A., El Bachraoui, F., Louihi, S. et al. Structural, Magnetic and Optical Properties Study of Tellurium-Based Perovskites: $Sr_{3-x}Pb_xFe_2TeO_9$ ($0 \leq x \leq 2.25$). J Inorg Organomet Polymer, 30 (2020) 1990–2006.
29. Zakaria Chchiyai, Fatima El Bachraoui, YoussefTamraoui, Lahcen Bih, Abdessamad Faik, Jones Alami, BouchaibManoun, Design and characterization of novel manganite

perovskites $Ba_{1-x}Bi_xTi_{1-x}Mn_xO_3$ ($0 \leq x \leq 0.2$), Ceramics International (2020) https://doi.org/10.1016/j.ceramint.2020.07.169
30. S. Benyounoussy, L. Bih, A. El Bouari, Influence of niobium oxide content on the structural features of silver phosphate glasses and their corresponding glass-ceramics, Materials Today Procceding, (2020) https://doi.org/10.1016/j.matpr.2020.08.598.
31. S. Benyounoussy, L. Bih, A. El Bouari, Structure and dielectric properties in silver phosphate AgPO3 glass–ceramic, Materials Today Procceding, (2020) https://doi.org/10.1016/j.matpr.2020.04.353
32. M.Jerroudi, L.Bih, E.Haily, L.Bejjit, M.Haddad, B.Manoun, P.Lazor, Materials Today Procceding, (2020) https://doi.org/10.1016/j.matpr.2020.08.462.
33. E. Haily, L. Bih, M. Jerroudi, M. Azrour, A. El Bouari, B. Manoun, Materials Today Procceding, (2020) https://doi.org/10.1016/j.matpr.2020.07.688
34. E. Haily, L. Bih, M. Jerroudi, S. Yousfi, A. El Bouari, B. Manoun, Materials Today Procceding, (2020) https://doi.org/10.1016/j.matpr.2020.04.339.
35. M. Jerroudi, L. Bih, E. Haily, S. Yousfi, L. Bejjit, M. Haddad, B. Manoun, P. Lazor, Materials Today Procceding, (2020) https://doi.org/10.1016/j.matpr.2020.04.765
36. M. Jerroudi, L. Bih, M. Azrour, B. Manoun, I. Saadoune, P. Lazor, Investigation of Novel Low Melting Phosphate Glasses Inside the Na2O–K2O–ZnO–P2O5 System, Journal of Inorganic and Organometallic Polymers and Materials, 30 (2020) 532–542
37. Structural, elelectrical and energy storage properties of $BaO–Na_2O–Nb_2O_5–WO_3–P_2O_5$ glass–ceramics system, A Ihyadn, A Lahmar, D Mezzane, L Bih, A Alimoussa, M Amjoud, M El Marssi and I A Luk'yanchuk, **Mater. Res. Express** 6 (2019) 115203.
38. Hicham Es-Soufi, Lahcen Bih, Meyrem Benzineb, Study of Tungsten Phosphate Glasses Containing Fe_2O_3, New Journal of Glass and Ceramics, 9, 33-49, 2019
39. Boubker Mehdaoui, H. Bensaid, Lahcen Bih, Reda Mobah, MA Valente, A. EL Bouari, Magnetic Properties of Disordered Li2Co2 – xNix(MoO4)3 ($0 \leq x \leq 2$) System with a Lyonsite Structure, Journal of Superconductivity and Novel Magnetism (2019) : 10.1007/s10948-019-5128-y
40. El Hachmi, A., Tamraoui, Y., Manoun, B., Haloui, R., Elaamrani, M., Saadoune, I., Lazor, P. Synthesis and Rietveld refinements of new ceramics Sr2CaFe2WO9 and Sr2PbFe2TeO9 perovskites. Powder Diffraction, 2018, 33(2): 134-140.
41. H. Es-soufi , H. Bih, L. Bih , M. Azrour , B. Manoun, P. Lazor, Structure and some physical properties of sodium ion conducting glasses inside the Na2O-Na2WO4-TiO2-P2O5 system, Journal of Applied Surfaces and Interfaces 4 (1-3) (2018) 1-8.
42. Said Daoudi, Lahcen Bejjit, Mustapha Haddad, El Mostapha Yahiaoui, Lahcen Bih, Faouzi Bensamka, Ahmed Outzourhit, EPR Characterization of Ferroelectric Ceramics (Sb, Cu)-Doped BaTiO3, American Journal of Materials Science 2017, 7(4): 71-77.
43. H. Es-soufi, L. Bih, B. Manoun, P. Lazor, Structure, thermal analysis and optical properties of lithium tungsten-titanophosphate glasses, Journal of Non-Crystalline Solids 463 (2017) 12–18.
44. H. Sinouh, L. Bih, B. Manoun, P. Lazor, Thermal analysis and crystallization of the glasses inside the BaO– SrO–TiO2–NaPO3 system, J Therm Anal Calorim, 128 (2) (2017) 883-890. DOI 10.1007/s10973-016-5986-5.
45. R. Haloui, B. Manoun, S. Louihi, M. Jahid, A. El Hachmi, R. Abkar, M. A. El aamrani, O. Ait Sidi Ahmed, L. Bih, P. Lazor, Crystal structure and phase transitions in new series of double perovskite oxides Ba2-xSrxCaTeO6 ($0 \leq x \leq 2$): X-ray diffraction and

Raman spectroscopy studies, Journal of Applied Surfaces and Interfaces 1 (1-3) (2017) 35-48.

46. S. Sair, A. Oushabi, O. Tanane, Y. Abboud*, L. Bih, M. Bouhamidi and A. El Bouari, Study and Design of a Mobile Solar Refrigerator Isolated by Ecological Materials, I J C T A, 9(38), 2016, pp. 121-132.
47. B. M. G. Melo, M. P. F. Grac¸, P. R. Prezas, M. A. Valente, A. F. Almeida, F. N. A. Freire, and L. Bih, Study of structural, electrical, and dielectric properties of phosphate-borate glasses and glass-ceramics, JOURNAL OF APPLIED PHYSICS 120, 051701 (2016).
48. A. Neqali, A. Belboukhar, H. Bensaid, , A. El Bouari, L. Bih, A. Alimoussa, S. Habouti, ,D. Mezzane., Diffuse phase transition and impedance spectroscopy analysis of Ba2.15-xNa0.7+xNb5-xWxO15 (x=0.25)ferroelectric ceramic, Applied Physics A , (2016) 122:625.
49. B.M.G. Melo, M.P.F. Graça, P.R. Prezas, M.A. Valente, A.F. Almeida, F.N.A. Freire, L. Bih, Structural and thermal characterization of phosphate based glasses promising for hydrogen absorption, Journal of Non-Crystalline Solids, Volume 434, 15 February 2016, Pages 28-35
50. H. Bih, I. Saadoune, L. Bih, M. Mansori, H. ToufiK, H. Fuess, H. Ehrenberg, Synthesis, Rietveld refinements, Infrared and Raman spectroscopy studies of the sodium diphosphate $NaCr_yFe_{1-y}P_2O_7$ ($0 \leq y \leq 1$), Journal of Molecular Structure, Volume 1103, 5 January 2016, Pages 103-109
51. Khadija Gourai, Abdeslam El Bouari, Bouchra Belhorma, Lahcen Bih, Adsorption of Methylene Blue on the Li3Fe1-xCrx(MoO4)3 (x = 0, 0.5, 1) Lyonsite Phases, American Journal of Chemistry 2016, 6(2): 47-54.
52. Khadija Allam, Abdeslam El Bouari, Bouchra Belhorma, Lahcen Bih, Removal of Methylene Blue from Water Using Hydroxyapatite Submitted to Microwave Irradiation, Journal of Water Resource and Protection, 2016, 8, 358-371.
53. H. ES-SOUFI, L. BIH, B. MANOUN, D. MEZZANE, P. LAZOR, Some physical properties of the glasses within the Li2O- Li2WO4-TiO2-P2O5 system, Materials Research Proceedings 1 (2016) 266-269.

List of projects (Responsible or Member)

1- Projet Aprd-multithématique 2022-2025, MPHOBATTS, Des conducteurs ioniques phosphatés comme électrolytes dans les batteries tout solide.

2- Projet MENA (FS Meknes-Uppsala University, 2015-2017, Ref. 2014-4286) Functional phosphate glass-ceramics for hydrogen production and environmental carbon dioxide mitigation.

3- Projet dans le cadre de l'appel à projets autour des phosphates (2016) : Les vitrocéramiques diélectriques phosphatées pour le stockage capacitif de l'énergie.

4- Projet dans le cadre de l'appel à projets 2014 « domaines prioritaires de la recherche » Des batteries lithium-ion compétitives à base de phosphates marocains pour le stockage et la conversion de l'énergie (ENERGYPHOS).

5- Action intégrée Maroc-Portugal, 2012-2014, (FS Meknes-Aveiro university): Functional phosphate glasses for solar energy storage: elaboration and characterization.

6- Projet FrigoSolaire (IRESEN): Conception et développement d'un frigo solaire sur triporteur

7- Projet AquaSolar (IRESEN) : Dessalement de l'eau saumâtre par l'énergie solaire au Maroc (AQUASOLAR).
8- Nanomaterials for Water purification via photoctalysis processes using solar energy. Projet Maroc-Allemagne MAR 10/003, 2010-2013, entre HAW Kiel –University of Applied Sciences Kiel, RFA et FST Errachidia-FST Marrakech-Fac. Sci. Agadir.
9- Projet Volubilis (MA/09/206) : Recristallisation de verres et étude des réactions interfaciales avec une céramique de type pérovskite.
10- Nouveaux Matériaux Electro-calorifiques (EC) pour la conversion thermoélectrique d'énergie, 12/TM 11, entre l'université de Sfax et FST-Marrakech & FST-Errachidia.
11- Projet MENA (FSTE-Uppsala University 2008-2010), International research grant,' High-pressure and high/low temperature studies on novel functional materials based on double perovskites, phosphate glassy-ceramics and alkali molybdates and tungstates'.
12- Action intégrée Maroc-Portugal, Physique/01 08-09 N, (FSTE-Aveiro university) ' Verres et composites 'verre-céramique' $BaNb_2O_6$-$(NaNbO_3)_2$-$(MO_3)_2$-P_2O_5 (M = Mo, W) : élaboration, recristallisation, propriétés structurales et diélectriques'.
13- Projet FSTE-CERPHOS, 2008, 'valorisation des matériaux fluorés'.
14- Action Intégrée (France-Maroc, MA/07/165, Volubilis-2007) intitulée 'Les ferroélectriques-relaxeurs TTB: une nouvelle famille de matériaux pour la microélectronique'.
15- Projet CORUS 2005 "Valorisation de nouveaux matériaux d'électrode positive des batteries rechargeables au lithium à haute densités " (Responsable local)
16- Protars (P22/02) "Les batteries secondaires au lithium à haute densité d'énergie : une solution de choix pour la production, le stockage et la conversion de l'énergie électrique".
17- Protars (P2T3/13) "Impact des changements climatiques sur les écosystèmes de la région de Tafilalt et ses environs depuis environ 140 000 ans BP".
18- Projet de coopération entre l'Université My Ismaïl–Ministère de l'artisanat. "Minéraux et fossils de la région Meknès Tafilalt" .
19- Projet de recherche avec CERPHOS "Préparation de nouveaux phosphosilicates à partir du phosphate naturel marocain" .).
20- Action Intégrée CNRS-CNRST "Etude des propriétés électriques et structurales des verres à base de phosphates alcalins (N° DC-7/92)".
21- Projet Maroc-Tunisie,08/TM/94, 'une nouvelle famille de matériaux avancés pour la nanotechnologie et la microélectronique' (Membre, Resp. D. Mezzane, FSTG-Marrakech).
22- Action intégrée Maroc-Tunisie : Nouveaux matériaux ferroélectriques: Elaboration et caractérisation de céramiques ferroélectriques et vitro-céramiques phosphomolybdates alcalins à base de titanate de baryum $BaTiO_3$. (21/04), entre l'université Monastir et FST-Errachidia.

Theses of Doctorate framed during the 8 last years,

1- Doctorat National : Mr ABBAS Lahbib (**2008**).
Titre : Propriétés, durabilité chimique et recristallisation des verres A_nO_m-MO_3-P_2O_5, $BaTiO_3$-$NaPO_3$ et Li_2O-Na_2O-MO_3-P_2O_5 (M=Mo, W ; A=Li, Na, K, Ca, Al, Fe, Pb).
2- Doctorat National : Mlle SINOUH Hasnaa (**2013**).
Titre : Verres et vitrocéramiques des systèmes SrO-TiO_2-P_2O_5, $NaPO_3$-$MTiO_3$, Na_2O-AO-TiO_2-B_2O_3-P_2O_5, C_2O-SrO-TiO_2-B_2O_3-P_2O_5 (M=Sr, $Ba_{0.5}Sr_{0.5}$, Ba; A=Sr,Ba; C=Na, Li): caractérisation, étude structurale, et propriétés électriques.
3- Doctorat National : BENSAID Hanane (**2013**).

Titre : Synthèse, propriétés et caractérisation physico-chimiques de nouveaux matériaux de type structural Bronze Quadratique de Tungstène (TTB) et Lyonsite.

4- Doctorat National : Mlle GOURAI Khadija (**2017**)

Titre : Osmose inverse alimenté par l'énergie solaire pour le dessalement des eaux saumâtres, à la FS-Ben M'sik Casablanca.

5- Doctorat National : Mlle ALLEM Khadija (**2017**)

Titre : Distillation membranaire des eaux saumâtres par l'énergie solaire à la FS-Ben M'sik Casablanca.

6- Doctorat National : Mr ES-SOUFI Hicham (**2018**)

Titre : Elaboration et caractérisation structurale, optique et électrique des verres phosphates $A_2O – A_2MO_4 – TiO_2 – P_2O_5$ (A = Li, Na ; M = Mo, W, FS-Meknès.

7- Doctorat National : Haily El Mehdi, (**2020**)

Titre : Verres et vitrocéramiques diélectriques titano-phosphatés pour le stockage électrostatique de l'énergie, à la FS-Meknès.

8- Doctorat National, Jerroudi Meryem (**2021**)

Titre : Corrélation propriété-structure des verres phosphatés des systèmes M_2O-MnO_2-P_2O_5 (M=K, Na), $NaPO_3$-KPO_3-MO (M=Zn, Mn) et Li_2O-ZnO-CoO-P_2O_5, FS-Meknès.

9- Doctorat National : Benyounnoussy Sannaa, (**2022**)

Titre :Verres et Vitrocéramiques diélectriques niobophosphates pour le stockage électrostatique de l'énergie, à la FS-Ben M'sik, Casablanca.

10- Doctorat National, Ihyadn Abderahim, (**2022**)

Titre : Vitrocéramiques diélectriques phosphatées à base des niobates de TTB pour le stockage électrostatique de l'énergie, à la FST-Guéliz.

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