Dr. Abdelhaq Nassiri, PhD

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Professional Summary

- ∇ Materials for Energy Storage and Conversion.
- ∇ Electrochemical storage expert with 8+ years of research experience in batteries.
- ∇ Development of the electrode materials for Alkali-ion batteries (Li, Na…).
- ∇ Demonstrated a capacity to lead teamwork and group (teaching and supervising).
- ∇ Expert in proposals writing for grant funding under national and international research programs.

Professional Experience

Sep 2021-July 2023 Marrakech, Morocco

Faculty of Science Semlalia, Cadi Ayyad University (UCA)

Temporary assistant professor

- Teaching and supervising master and PhD students.
- Proposals writing for grant funding under national research programs.
- Scientific project collaboration with other fields.

Mai 2015-June 2021 Marrakech, Morocco

IMED Lab at Cadi Ayyad University (UCA)

Doctoral Researcher

- Synthesis of a new active materials phosphate based for Sodium-ion Batteries.
- Using different method (solid state reaction, sol gel, pyrolysis, Combustion …).
- Standard characterizations (XRD, SEM/TEM, ATD/ATG, FTIR, Raman spectroscopy…)
- Electrochemical characterizations (GCPL, GITT, CV…...)
- Advanced characterizations in situ Synchrotron and ex situ XPS.
- Published 3 scientific articles as the first author in peer-reviewed journals.

November-December 2017 Karlsruhe, Germany

IAM-ESS Lab at Karlsruhe Institute of Technology.

Research training

- Electrode preparation for electrochemical test using several formulations
- Standard characterizations (XRD, SEM-EDX, ATD/ATG, Raman spectroscopy…)
- In situ synchrotron and ex situ XPS measurement

- Training course of refinement method via Fullprof software (Prof Knapp).

October-November 2015 Sakarya, Turquie

Engineering Faculty, Sakarya University.

Research training

- Microwave synthesis of phosphates nanoparticles
- Optimization of coating method via microwave approach
- Characterizations (XRD, SEM-EDX, ATD/ATG, Raman spectroscopy…)
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January-June 2014 Marrakech, Morocco

LCMN-Lab at Cadi Ayyad University

Junior researcher

Title: "Chitosan-TiO_2 nanocomposite: Synthesis, characterization and photocatalytic activities under UV irradiation"

- Synthesis of a nanocomposite via solvothermal and sol gel method.
- Standard characterizations (XRD, SEM/, ATD/ATG, IR spectroscopy, and UV-visible…)
- Adsorption study of Ch@TiO_2 versus tow dyes (cationic and anionic)
- Photocatalytic study of Ch@TiO_2 under UV and light irradiation.

Education

January 2024-Februry 2025, Trieste-Italy

Advanced Master in Sustainable Blue Economy at University of Trieste and OGS institute.

July 2021, Marrakech-Morocco

PhD in Chemistry and Materials Science, from Faculty of Sciences and Technology, University of Cadi Ayyad (FST-UCAM).

July 2014, Marrakech-Morocco

Master degree of Sciences and Techniques in Functional Materials, awarded from Faculty of Science and Technology, Cadi Ayyad University (FST-UCAM).

July 2012, Marrakech-Morocco

Bachelor in Inorganic Chemistry (Ceramic and glass) awarded from Faculty of Sciences Semlalia, University of Cadi Ayyad (FSSM-UCAM).

Publications

A. Nassiri, N. Sabi, A. Sarapulova, W. Yingjin, B. Manoun, S. Indris, M. Alexandr, H. Ehrenberg, I. Saadoune, Elucidation of the sodiation/desodiation mechanism in $Ca_{0.5}Ti_2(PO_4)_3$/C promising electrode for sodium batteries: New insights into the phase transitions, Journal of Energy Chemistry. (2022). https://doi.org/10.1016/j.jechem.2022.01.036.

S. Ait Bouzid, M. Sajieddine, E.K. Hlil, O. Mounkachi, M. Mansori, **A. Nassiri**, A. Essoumhi, Structural, magnetic transition and magnetocolaric properties of $La_{1-x}Li_xMn_{1-y}Fe_yO_3$ (x = 0.1, 0.2 and y = 0, 0.1) manganites, Appl. Phys. A. 128 (2022) 121. https://doi.org/10.1007/s00339-021-05254-6

A. Nassiri, N. Sabi, A. Sarapulova, S. Indris, S. Mangold, H. Ehrenberg, I. Saadoune, $Co_{0.5}TiOPO_4$@C as new negative electrode for sodium ion batteries: Synthesis, characterization, and elucidation of the electrochemical mechanism using in operando synchrotron diffraction, Journal of Power Sources. 498 (2021) 924-229. https://doi.org/10.1016/j.jpowsour.2021.229924.

A. Nassiri, N. Sabi, A. Sarapulova, M. Dahbi, S. Indris, H. Ehrenberg, I. Saadoune, $Ni_{0.5}TiOPO_4$ phosphate: Sodium insertion mechanism and electrochemical performance in sodium-ion batteries, Journal of Power Sources. 418 (2019) 211–217. https://doi.org/10.1016/j.jpowsour.2019.02.038.

S. Difi, **A. Nassiri**, I. Saadoune, M.T. Sougrati, P.-E. Lippens, Electrochemical Performance and Mechanisms of $NaSn_2(PO_4)_3$/C Composites as Anode Materials for Li-Ion Batteries, J. Phys. Chem. C. 122 (2018) 11194–11203. https://doi.org/10.1021/acs.jpcc.7b12770.

A. Nassiri, Y. Chaali, I. Saadoune, $Li_{1.5}Fe_{0.5}Ti_{1.5}(PO_4)_3$/C phosphate as promising electrode material for electrochemical energy storage, in: 2016 International Renewable and Sustainable Energy Conference (IRSEC), (2016): pp. 969–972. https://doi.org/10.1109/IRSEC.2016.7983971.

Conferences

A. NASSIRI "Towards high-electrochemical performances for sodium-ion batteries: Phosphate-based polyanionic electrode materials as a promising choice" the 8th edition of Materials for Energy Symposium, UM6P-Bengurir, Morocco, October 4th to 6th 2023.

A. NASSIRI, I. SAADOUNE "Phosphate-based materials as electrodes for rechargeable sodium-ion batteries" 13th International Conference on Advanced Lithium Batteries for Automobile Applications, UM6P-Bengurir, Morocco, October 16th to 19th 2022.

A. NASSIRI, I. SAADOUNE "Synthesis and characterization titanium oxyphosphate $M_{0.5}TiOPO_4$@C (M= Co, Ni) as an anode material for Sodium Ion Batteries (SIBs)" La 1ére Edition des doctoriales CERNE2D 2019 à ENSET à Rabat, 12th-14th juin 2019.

A. NASSIRI, N. SABI, A. SARAPULOVA, V. TROUILLET, S. INDRIS, M. BRUNS, H. EHRENBERG, I. SAADOUNE "Calcium Titanium Phosphate as a promising electrode for sodium ion batteries", The International Conference for Research on Phosphates and Derivatives, Ben Guerir, Morocco, Nov 10th-11th, 2018

A. NASSIRI, N. SABI, A. SARAPULOVA, V. TROUILLET, S. INDRIS, M. BRUNS, H. EHRENBERG, I. SAADOUNE "Electrochemical performances of Oxyphosphates in sodium ion batteries", The International Conference for Research on Phosphates and Derivatives, Ben Guerir, Morocco, Nov 10th-11th, 2018

A. NASSIRI, I. SAADOUNE "$Ca_{0.5}Ti_2(PO_4)_3$ phosphate as a promising electrode for Sodium Ion Batteries (SIBs)", In The international conference "Humboldt Kollege" "Beacons of Hope in the Quest for the Next Einstein in the MENA region" Marrakech, Morocco, April 4-6, 2018.

A. NASSIRI, R. AMINE, K. AMINE, I. SAADOUNE "$Mn_{0.5}Ti_2(PO_4)_3$ phosphate: an active electrode material for sodium-ion batteries" 10th International Conference on Advanced Lithium Batteries for Automobile Applications, Oak Brook, IL, Oct 22nd– 25th, 2017.

A. NASSIRI, A. SOLHY, K. AMINE, I. SAADOUNE "Safe electrode material for Li-ion batteries based on phosphate" 9th International Conference on Advanced Lithium Batteries for Automobile Applications, Huzhou, China, Oct 22nd-25th, 2016.

Technical Skills

- ∇ Expert in elaboration and characterization of nanomaterials and nanocomposites.
- ∇ Lithium/Sodium ion batteries: electrodes (positive and negative) and electrolyte,
- ∇ Powder X Ray Diffraction, Microscopy analysis (SEM, EDX, TEM), Thermal analysis (TGA, DTA), SEM, TEM Spectroscopy analysis (FTIR, Raman Spectroscopy)
- ∇ Electrochemical characterizations: GCPL, GITT, CV….
- ∇ Synthesis and manipulation in gloves box under control atmosphere
- ∇ Using different cell types (Swagelock, Coin cells).
- ∇ Good capacity of management of Lab and project Management
- ∇ Good team worker and productive

Honors and awards

Partial Scholarship by OGS institute for Advanced Master of Sustainable Blue Economy period : from 1/03/2024 to 01/05/2025

Scholarship of Excellent students by National Center for Scientific and Technical Research (CNRST Morocco) Period : from 01/07/2015 till 01/07/2018 (3 years).

Academic Excellence Award (MA/2014) for the outstanding academic achievements - Cadi Ayyad University (01/08/2014).

Academic Excellence Award (BA/2012) for the outstanding academic achievements - Cadi Ayyad University (01/08/2012).