

Curriculum Vitae

Personal data:

Name: Dr. Hmoud Al-Dmour
Place & date of Birth: Al-Karak, 30/8/1979
Nationality: Jordanian
Marital status: Married
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Education:

BSc in Physics from Mutah University, Jordan, 2002.

PhD in Materials and Sensors/Nano-Technology (Nano-Physics) from College of Physical and Applied Science /University of Wales/ Bangor, United Kingdom, 2008.

Thesis title: "Solar Cells Based on the Nano-Crystalline-TiO₂ Semiconducting Polymer Heterojunction"

Professional Experience :

2008 -2009	Full Lecture / Tafila Technical University
2009 -2015	Assistant Professor /Mu'tah University
2015 – 2021	Associate Professor / Mu'tah University
2018 – 2019	Associate Professor / Taibah University
2021 - Present	Professor /Mu'tah University

Awards:

University Studentship, Awarded by the University of Wales in the UK to study for a PhD degree in Materials and Sensors.

University Award, Awarded by Mutah University, Jordan, 2002/2003 for getting the first rank.

Research Grants Awarded:

I finished three-years project funded by the Scientific Research Support Fund, Ministry of Higher Education and Scientific Research / Jordan for the amount of JD120000 (principal investigator).

Academic Administration Experience :

2010- 2011 Assistant Dean of College of Science, Mutah University, Jordan

2013-2014 Head of the Dept. of Physics , Mutah University, Jordan

2016 - 2017 Vice - Dean of Science College

Research Interests:

I have produced the highest efficiency solar cells of their type (Heterojunction solar cells based on dye-Sensitised Nano Crystalline Titanium Dioxide and Poly (3-Hexylthiophene)). The aim of my research was to produce an efficient and inexpensive solar cell that would be commercially viable for the domestic market. The more traditional silicon solar cells used today are expensive to produce. This new technology will make choosing a carbon neutral energy source cheaper and therefore more attractive. I have done some work on polymer transistors during my PhD.

Skills:

I worked in a class 1000 microfabrication clean room during my PhD studies. I have got experience in fabricating solar cells based on the nc-TiO₂ semiconducting polymer heterojunction. I studied the characteristics of the semiconductor polymer and Nano Crystalline -TiO₂ films using various techniques (AFM, SEM, STS, and XRD). I used a Solartron 1260 Frequency Response Analyzer and Keithley model 4200 source-measure unit to study the electrical characterisation (AC and DC measurements) of polymer semiconductor devices. I helped my supervisor with his master and undergraduate students for fabricating devices, preparing experiments and analysing results.

Collaboration with Cambridge University:

I did part of my research in Cavendish Laboratory/ Cambridge University during my PhD studies. The Cavendish Laboratory was founded in 1871 and has a distinguished intellectual history, with 29 Nobel prize winners who worked for considerable periods within its facilities, and is associated with many notable discoveries.

Publications:

1. "Effect of Nanocrystalline-TiO₂ Morphology on the Performance of Polymer Heterojunction Solar Cell", **H. Al-Dmour**, D. M. Taylor and J. A. Cambridge, Journal of Physics D: Applied Physics 40 (2007) 5034 (It has been selected as one of the highlights of the articles published in Journal of Physics D: Applied Physics (J. Phys. D) in 2007.).
2. "Revisiting the Origin of Open Circuit Voltage in nc-TiO₂:Polymer Heterojunction Solar Cells", **H. Al-Dmour**, D. M. Taylor, Applied Physics Letter, 94 (2009) 22309
3. "Small-signal response of nanocrystalline-titanium dioxide/poly(3-hexylthiophene) heterojunction solar cells", **H. Al-Dmour**, D. M. Taylor, Thin solid Film , 22 (2011) 813 4.
4. "Host-guest complex of cucurbit [7] uril with albendazole in solid state", N. Seleh, A.Khaled, **H. Al-Dmour** , B. Al Hindawi , E. Yakushenko Journal of Thermal Analysis and Calorimetry 111(2013) 392 .
5. " Effect of Molecular-Level Insulation on the Performance of a Dye-Sensitized Solar Cell: Fluorescence Studies in Solid State", N Saleh, S Al-Trawneh, **H. Al-Dmour**, S Al-Taweel, JP Graham, Journal of fluorescence 25(2014) 59-68.
6. "The Effect of Z907 Dye on the Performance of Solar Cells Based on the Nc-TiO₂ Semiconducting Polymer Heterojunction", **H. Al Dmour** , Jordan Journal of Physics , 8 (2015) 103-111.
7. "Effect of Ambient Air Condtions On Low Frequency Capacitance NC-TiO₂/P3HT Heterojunction Solar Cells , H. Al Dmour, American Journal of Applied Sciences, 11 (2014) 1351-1356.

8. "Study the Effect of Ruthenium Dye Layer on Negative Capacitance in Solar Cells Based on the Nc-TiO₂ Semiconducting Polymer Heterojunction ", **H. Al Dmour** , Materials Sciences and Applications, 6 (2015) 95-102.
9. "Enhanced Energy Conversion of Z907-Based Solar Cells by Cucurbit[7]uril Macrocycles", **H. Al Dmour** , Reem H. Alzard, Hamda Alblooshi, Khaula Alhosani, Shaqra AlMadhoob, and Na'il Saleh , Frontiers in Chemistry. 2019, 7, 561
10. "Admittance spectroscopy analysis of dye-sensitised solar cells with host-guest complexes". **H Al Dmour**. Indian Journal of Science and Technology.2020, 13 (16), 1686-1692
11. " A comparative study of titanium dioxide preparation methods in solar cells based on the TiO₂ semiconducting polymer heterojunction". **H.Al Dmour**. International Journal of Advanced and Applied Sciences. 2020. 7 (12), 133-138.
12. "Synthesis, characterization, and performance of oligothiophene cyanoacrylic acid derivatives for solar cell applications". **H. Al Dmour**, Salah Al-Trawneh , Samir Al-Taweel. International Journal of Advanced and Applied Sciences. 2021. 8(6), 128-135
13. "Capacitance response of solar cells based on amorphous Titanium dioxide (A-TiO₂) semiconducting heterojunctions". **H Al-Dmour**. AIMS Materials Science.2021. 8 (2), 261–270.
14. "Al and Zr porous clay heterostructures as removal agents of Basic Blue 41 dye from an artificially polluted solution: regeneration properties and batch design. **H Al Dmour** , Fethi Kooli , Ahmed Mohmoud , Yan Liu and Saheed Abiodun Popoola. Materials. 2021.14(8).253

15. Application of Murphy – Good Plot Parameters Extraction Method on Electron Emission from Carbon Fibers. Mazen A. Madanat, Ahmed A. Al-Tabbakh, Mohammed Alsa'eed, **Hmoud Al-Dmour**, Marwan S. Mousa. Ultramicroscopy. 2022, 113479

16. Utilizing Spectroscopy and Optical Microscopy to Characterize Titanium Dioxide Thin Films **H Al Dmour** East European Journal of Physics, 171-175

17. Organophilic clays for efficient removal of eosin Y dye properties SA Popoola, **H Al Dmour**, B Messaoudi, I Fatimah, S Rakass, Y Liu, ...Journal of Saudi Chemical Society 27 (5), 101723

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18. Effect of properties of NC-TiO₂ grains on the performance of organic/inorganic solar cells. **H Al-Dmour**, DM Taylor Journal of Ovonic Research 19 (5)

19. SCAPS Numerical Analysis of Graphene Oxide/TiO₂ Bulk Heterojunction Solar Cell Sensitized by N719 Ruthenium Dye H Al Dmour East European Journal of Physics, 555-561

20. Effect of thiophene rings rigidity on dye-sensitized solar cell performance. Dithienothiophene versus terthiophene as π - donor moiety S Al-Taweel, S Al-Trawneh, **H Al-Dmour**, O Al-Gzawat, W Alhalasah, ... Heliyon 9 (10)

21. Parameters Synthesis of Na-Magadiite Materials for Water Treatment and Removal of Basic Blue-41: Properties and Single-Batch Design Adsorber AM Alanazi, **H Al Dmour**, SA Popoola, H Oudghiri Hassani, S Rakass, ... Inorganics 11 (11), 423

22.. Ambient Effect on nc-TiO₂/P3HT Solar Cells Performance”, **H. A. Al-Dmour**, D. M. Taylor, International Conference on Organic Electronics (ICOE), June 2006, Eindhoven, The Netherlands.

23. Morphology of Nanocrystalline TiO₂ for Improved Heterojunction Solar Cell Performance, **H. A. Al-Dmour**, D. M. Taylor and J. A. Cambridge, International Conference on Organic Electronics (ICOE), 04 - 07 June 2007, Eindhoven, The Netherlands.

24. Nano-crystalline TiO₂-Semiconducting Polymer Solar Cells”, D. M. Taylor and **Hmoud Al-Dmour**, Hybrid Organic/Inorganic/Metallic Electronic and Optical Devices, April, 2006, San Francisco, USA2006 .

25. Influence of ambient conditions on the electrical characteristics of nanocrystalline-TiO₂/P3HT solar cells **H Al Dmour** . Nano Conference 2009, April 2009, Riyadh, Saudi Arabia.

Teaching Experience:

I have taught the following courses many times:

1. General Physics 1 (Classical Mechanics).
2. General Physics 2 (Electricity and Magnetism).
3. General Physics Labs 1& 2.
4. Electronics & Electronics Lab.
5. Materials Science
6. Modern Physics
7. Optics
8. Solid State Physics
- 9- Materials science
- 10- Electronic
- 11- Electronic Lab
- 12- Optics Lab
- 13- Modern Physics
- 14- Wave and Vibrations
- 15- Mathematical Physics
- 16- Special Topics (For Graduate Student)
- 17- Solid State Physics (For Graduate Student

Supervision of Graduate Students:

Ahmad Badwi, *The effect of thickness of nc-TiO₂ on DC and AC measurements of organic/inorganic solar cells*, 2020

Community Service , Department Committees :

Member of faculty recruitment committee in Physics Department (2011).

Member of the college of science council at Mu'tah University (2013 and 2017).

Chairman of the graduate studies committee at the Faculty of Science, Mu'tah University (2017).

Member of the subcommittee for the student union election for the faculty of science / Department of Physics / eighteenth session .

Member of the subcommittee for the student union election for the faculty of science / Department of Physics / nineteenth session .

Member of scientific research committee in Physics Department.

Member of the science committee, The Scientific Research Support Fund (SRSF), Ministry of Higher Education and Scientific Research, (2017-2018).

Member of the science committee, The Scientific Research Support Fund (SRSF), Ministry of Higher Education and Scientific Research, (2018-2019).

Member of the committee for the accreditation of College of Science in Yarmouk University in accordance with the Jordanian Accreditation Board. Higher Education Accreditation Commission (2017).

Languages and computer skill

1- Professional in Arabic and English

Arabic - Native Language.

English - Excellent.

2- Professional in Computer skill (ICDL since 2011)

References:

- Professor Martin Taylor, College of Physical and Applied sciences, University of Wales Bangor, Dean Street, Bangor Gwynedd, UK, LL57 1UT.
Email: d.m.taylor@bangor.ac.uk
- Prof. Marwan Mousa, Department of Physics, Collage of Science, Mu'tah University, Karak, Amman, Jordan . Email: marwansmousa@yahoo.com
- Prof. Samir Ahmed Al-Taweel, Chemistry Department, Collage of Science, Mu'tah University, Karak, Amman, Jordan .
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