



Helwan University
Faculty of Science
Department of Physics

CURRICULUM VITAE

Dr. Mahmoud Hammam

Professor and Vice Dean
(Graduate Studies & Research)

2006

CURRICULUM VITAE

Mahmoud HAMMAM - Professor

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1- PERSONAL DATA :

Full Name : Mahmoud Hammam Ibrahim Hammam
Born October 6, 1952
Cairo, Egypt.

Nationality : Egyptian (& Belgian) citizen

Marital Status : Married - Two Children
(Isra, 17 years & Dina 15 years)

Present Rank: *Professor, Experimental Solid State Physics*

Date of Present Rank : 31/07/1993

Mailing Address: Helwan University
Faculty of Science
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Ain Helwan, Cairo

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+(20-2) 27 19 189
Mobile: 010 522 0601

E-Mail Address : Hamam@aucegypt.edu

Languages : **English** : *EXCELLENT*
Arabic: *Mother Tongue*
Dutch : *GOOD*

2- ACADEMIC QUALIFICATIONS :

Degree	Awarding Institution	Year	Title of Thesis or Specialization
Doctor	Catholic	1983	Steady State Photoconductivity in

of Science	University at Leuven, Belgium		Amorphous Arsenic-Selenium Com-pounds.
Grade	Great Distinction		Auxiliary Thesis In Egyptian Remote Areas, The Use of Presently Available Solar Power Generation Equipment's is Economically Feasible for Some Applications".
M.Sc.	Catholic University at Leuven, Belgium.	1980	Study of X-Ray Florescence and Diffraction Phenomena.
M.Sc.	Mansoura University, Mansoura, Egypt.	1978	Study of Some Physical Properties of A Polymer loaded with Different Concentrations of Carbon Black.
B.Sc.	Cairo University, Cairo, Egypt.	1974	B.Sc. in Physics.

3- EXPERIENCE :

- Jan. 2006 – Present* : **Vice Dean**
Graduate studies & Research
Faculty of Science
Helwan University
Cairo, Egypt
- Aug. 2005 – Jan. 2006* : **Vice Dean**
Environmental Affairs
Faculty of Science
Helwan University
Cairo, Egypt
- Sept. 2004 - Aug. 2005* : **Chairman, Physics Department**
Faculty of Science
Helwan University
Cairo, Egypt
- Sept. 2001 - Aug. 2004* : **Visiting Professor (F/T)**
American University in Cairo
Department of Physics
- Jan. 2000 – Sept. 2001* : **Chairman, Physics Department**
Helwan University

Cairo, Egypt
American University in Cairo P/T

- Sept. 1999 - Jan. 2000* : - **Visiting Professor**
University of United Arab
Emirates (Al-Ain, UAE)
- Aug. 1998 - Sept. 1999* : -Department of Physics,
Helwan University,
Ain Helwan, Egypt (Full Time)
-American University in Cairo P.T
- Jan. 1994 – Aug. 1998* : Department of Physics
University of Mansoura (F.T)
- Sept. 1988 - Jan. 1994* : Department of Physics,
University of Bahrain, Bahrain.
- Sept. 1986 - Sept. 1988* : Department of Physics,
American University in Cairo,
Egypt. (P.T).

Department of Physics,
Faculty of Science,
University of Mansoura,
Mansoura, Egypt. (Full Time).
- Sept. 1985 - Sept. 1986* : Department of Electrical
Engineering,
University of Pennsylvania,
Philadelphia, PA,
U.S.A. (Fulbright Scholar)
- March 1984 - Sept. 1985* : Department of Physics,
University of Mansoura,
Mansoura, Egypt.
- Nov. 1983 - March 1984* : Visiting Scholar,
Department of Physics,
Catholic University at Leuven,
Belgium.
- Sept. 1979 - Nov. 1983* : Graduate Assistant,
Department of Physics,
Catholic University at Leuven,
Belgium
- Oct. 1974 - Sept. 1979* : Research Assistant,

M.Sc. Student,
Department of Physics,
University of Mansoura,
Mansoura, Egypt.

Sept. 1970 - Sept. 1974 : Undergraduate Student,
Department of Physics,
Cairo University,
Cairo, Egypt.

4- RANK PROFILE :

31/07/93	<i>Professor</i>
31/07/88	<i>Associate Professor</i>
28/06/84	<i>Assistant Professor</i>
09/11/83	<i>Award of Doctor of Science Degree</i>
31/12/78	<i>Senior Lecturer</i>
07/10/74	<i>Demonstrator</i>

5- HONOURS :

1. Senior Research Scholarship from the Catholic University at Leuven (Belgium), F/87/23 (July 92) and F/95/17 (Aug. 95).
2. Senior Fulbright Research Scholarship in Physics (1985-1986), Department of Electrical Engineering, University of Pennsylvania, Philadelphia, U.S.A.
3. Scholarship for the degree of "Doctor of Science", Catholic University at Leuven, Belgium. (1980-1983).
4. Scholarship for the degree of M.Sc. in Physics, Catholic University at Leuven, Belgium. (1979-1980).

6- INTERNATIONAL CONSULTATION :

A mission undertaken for the United Nations Environment Program (UNEP/ROWA) from 1st. June - 31 December 1989.

T I T L E Preparation of a proposal for a training program for the Countries of West Asia on Hazardous Waste Management in a form of a project document. SSA. No. 89/04

7- ORGANIZATION OF INTERNATIONAL CONFERENCES :

- Member of the organizing committee of the international Conference on Condensed Matter Physics and Applications (ICCOMPA) held in Bahrain, April 1992.
- Assistant Secretary of the 11th. Conference on Solid State Science and Applications, Mansoura University, 12-15 April (1987), Egypt.

8- GENERAL LECTURES (1988-2000) :

A series of lectures on different subjects on physics has been given to some preparatory and secondary schools in Bahrain as per previous invitations. An annual seminar is given to the secondary school students of Futures Language schools, Cairo, Egypt using multimedia to promote teaching physics in the stage of Pre- University students.

9- DEPARTMENT OF PHYSICS COMMITTEES

(i) 1988-1996 :

- Promotion Committee, University of Bahrain
(*Rank Assistant to Associate Professor*).
- Research and Conference Committee.
- Equipment Committee.
- Computer committee.
- Renewal of Contracts Committee, University of Bahrain
(*Rank up to Associate Professor*).
- Committee of revising and updating the bylaws of the Department of Physics, University of Mansoura, Egypt.
- Committee of cooperation and link between the University of Mansoura and industry at Dakahlia governorate, Egypt.

(ii) 1998-2001

- Chairman of the physics department, Helwan University, Cairo, Egypt.

(iii) 2001- 2004

- Member of different committees at the Department of Physics at the American University in Cairo (AUC).
- Academic Advisor for some Physics Major Students.
- Coordinator for the Declaration of Physics as a Major at AUC.

(iv) 2002-2004

- Member of the **University Senate** (American University in Cairo), representing the Physics Department.
- Member of the Executive Committee of the Senate at large.
- Chairman of the Benefits and Compensation Committee.
- Member of the Enrollment and Competition Committee.
- Member of the Faculty Affairs Committee, University Senate

Faculty Services Committee (2000 – 2004)

- A member of the subcommittee for the orientation program for the new faculty members 2003 & 2004.

Member on the Fulbright selection committee for the Egyptian Post-Doctoral Research Program for scholars in the fields of Physics (1998-present).

Vice President of the “Parents-Teachers Association” of the Futures Language Schools (for girls) (1994-present), Nasr City, Cairo.

10- DOCTORAL EXAMINATION COMMITTEE :

- Member of the doctoral examination committee of A Doctor of Science Candidate (June, 1996), Department of Physics, Catholic University at Leuven, Belgium (External Examiner).
- Member of a number of M.Sc. and Ph.D. examination committees in the Egyptian Universities as an external examiner.

11- PROFESSIONAL SOCIETIES :

Member of the following Societies :

- American Physical Society (APS).
- Materials Research Society (MRS).
- American Ceramic Society (ACrS).
- The Egyptian Society of Solid State Science and Applications.
- Egyptian Biophysics Society.
- Bahrain Astronomical Society.

12- TEACHING EXPERIENCE :

1. Courses taught at :

(a) University of Bahrain (1988-1993)

INSC	012	Integrated Science
PHYS	110	General Physics I
PHYS	102	General Physics II
PHYS	208	Applied General Physics
PHYS	343	Solid State Physics I

PHYS 406 Advanced Experimental Physics
PHYS 420 Medical Physics
PHYS 450 Senior Project

(b) American University in Cairo (AUC) (1986-1988) &
(1994-2004)

PHYS 111 General Physics I
PHYS 112 General Physics II
PHYS 123 General Physics Lab I
PHYS 124 General Physics Lab. II
PHYS 301 Seminar
PHYS 401 Undergraduate Thesis
PHYS 402 Independent Study

(c) University of Mansoura, Egypt (1984-1988) &(1995-1998)

(i) Graduate level :

- * Solid State Physics
- * Physics of Non-Crystalline Solids

(ii) Undergraduate level :

- * Solid State Physics I
- * Semiconductor Physics
- * Modern Physics
- * Geophysics
- * Electricity and Magnetism
- * Bulk properties of Matter
- * Waves and Vibrations
- * Alternating Current Circuits

(d) Cairo University

(National Institute for Laser Enhanced Sciences, NILES)

Graduate level

- * Gas Detection by Lasers (for special diploma)
- * General Physics (for general diploma)

(e) Helwan University

(i) Graduate level

- * Solid State Physics II
- * Physics of Non-Crystalline Solids

(ii) Undergraduate level

- * Atomic and Molecular Spectra
- * Solid State Physics I.
- * Electricity and Magnetism.
- * Properties of Matter.
- * Physics for Pre-Pharmacy students
- * Special Course (4th year students)

2. Projects offered to Undergraduate students (1988-1999) :

- Preparation, Electrical Properties and Infrared Spectroscopy of a-S,C:H and a-Si,S,C:H Alloys.
- Photoconductivity and CPM in Amorphous Hydrogenated Silicon based Alloys.
- Application of Solar Energy in the Egyptian Remote Areas.

3. Undergraduate Course Development:

Teaching the freshman physics courses, Phys. (111) and Phys. (112) at AUC, has been developed using WebCT course management. The course materials have been uploaded on the web with different communication facilities that help the students better understand and communicate with the different concepts and problems.

4. Academic Integrity:

- I normally discuss with my students my policies concerning Plagiarism in general at the beginning of each semester as I introduce the subject in the syllabus or course outline. On individual assignments I always teach them the proper citation or referencing of sources or internet.
- I never ignore any suspected incident of cheating in any of my courses. On the other hand, I find it a good occasion to talk more about academic integrity in general.
- If I find out with no doubts that a student had cheated in any of my exams I normally fail the student on the test assignment. If it is in a final exam I fail the student for the course.
- In my opinion, if a proper action is taken in the class room, there will be no need to report the case to anyone except if the student tries again to cheat.
- In order to reduce cheating in my courses I provide information about cheating/plagiarism in advance. I change my exams regularly. I also hand out different versions of an exam. I proctor all my exams myself, with the help of an assistant.
- I find it also necessary to discuss my views on the importance of honesty and academic integrity with my students.

13- EXPERIENCE IN LABORATORY DEVELOPMENT :

1. Advanced Research Laboratories :

I have contributed to the introduction and installation of advanced research facilities in the Department of Physics, University of Bahrain and Department of Physics, University of Mansoura (Egypt). The operation of these facilities has now become a shared responsibility among the faculty members. The advanced laboratories to which I have major contributions are :

a. At the Department of Physics, University of Bahrain (1988-1993) :

(i) Hydrogen Evolution Technique :

For determining the hydrogen concentration and hydrogen bonding configuration in semiconductors. The facilities for this technique have been purchased using the University of Bahrain funded research proposal where I am the principal researcher.

(ii) CPM (Constant Photocurrent Method) :

To study the optical subgap spectra of amorphous hydrogenated silicon based alloys prepared in the department. All the facilities of this technique have been purchased using the University of Bahrain funded research project where I was the principal researcher.

(iii) Sharing the responsibilities of operating the sample preparation laboratory :
(Glow discharge system and the thermal evaporation technique).

(iv) Sharing the responsibility for the operation of the following equipment's :

- * Fourier Transform Infra-red (FTIR) Spectrometer
- * UV-VIS-NIR Spectrometer
- * Electrical Conductivity and Photoconductivity set-up.

b. At the Department of Physics, University of Mansoura, Egypt (1984-1988) :

Polymer Physics Laboratory :

I have a major contribution to this laboratory in carrying out many of the advanced projects leading to the degree of M.Sc and Ph.D.

- (i)** A system for corona discharge technique has been built for applications in the field of polymeric materials and to study the effect of the corona on the different properties of the samples prepared..
- (ii)** I have built a “home-made” cryostate to be used in measuring the electronic transport properties in dark and under illumination in the temperature range 80 K to 600 K.

- (iii) I have A major contribution in building a machine to be used in carrying out some tensile experiments in the temperature range R.T. to 200° C. This machine has been used to study the mechanical properties of the polymeric materials in the form of either strips or fibers.
- (iv) I have established a Semiconductor Physics group. A research laboratory has been partially equipped for studying the Electrical and Photoconductive Properties of semiconducting materials in the form of Thin Films as well as bulk samples.

c. At the Department of Electrical Engineering and LRSM, University of Pennsylvania, Philadelphia, U.S.A. :

I have contributed in building a spectrometer set-up that has been designed and installed to measure the absolute transmission and reflection spectra simultaneously. This automatic system consists of a quartz - halogen tungsten lamp, an electromechanical chopper, double pass monochromator and a filter to remove second order light. The transmitted or reflected beams are measured by A silicon photodetector. Data are automatically acquired by a small computer. In this system, the sample and detector are mounted on a rotating gear driven by a synchronous motor.

2. Undergraduate Teaching Laboratories :

I had a major contribution in planning, installing and writing up manuals for the experiments offered to the undergraduate students at the University of Mansoura, Egypt (1974-1988).

A manual that contains all the experiments offered for the course Phys. 343 (Solid State Physics) has been prepared for the department of Physics, University of Bahrain (1988-1993).

I have edited and prepared a book on electricity and Magnetism for 1st year science and pre-medical students at the Department of Physics, University of Mansoura, Egypt.

A series of lecture notes, for first year Science and Engineering students, have been prepared for the University of Helwan students.

14- THESIS SUPERVISION :

I have co-supervised a number of M.Sc. and Ph.D. Thesis, Department of Physics, University of Mansoura, Mansoura, Egypt in the field of physics of polymeric materials and semiconductors. The subject of most of these theses was in the area of Amorphous Semiconductor, Thermally Stimulated Currents in polymer films, Electronic Transport properties and the study of the Mechanical properties of these materials.

I also currently supervise 4 Ph.D. students in Helwan University, Damietta University, Alexandria University and Banha University. A couple of M.Sc. students in each of Banha University and Helwan University are about to submit their theses under my supervision soon.

15- UNIVERSITY FUNDED RESEARCH PROJECTS :

(1) (UNIVERSITY OF BAHRAIN) (1988-1993):

- Study of atomic structure, hydrogen bonding, and plasma chemistry of hydrogenated amorphous and crystalline semiconductors -I-

(1990-91, Amount of 5,665.00 BD = 15000 \$)

- Study of the structure and electronic properties of hydrogenated amorphous and crystalline semiconductors -II-

(1991-92, Amount of 2,200.00 BD = 5800 \$)

- Investigation of the structural and electronic properties of hydrogenated amorphous and crystalline semi-thin films.

(1992-93, Amount of 1,200.00 BD = 3200 \$)

(2) American University in Cairo, Research Development Project, 2003-2004

- Design, Developing and Testing a Solar Concentrator for Thermo Acoustic and Cooling Applications.

(Dec. 1, 2003 – June 30, 2004, Amount of *LE* 15000)

16- RESEARCH INTERESTS :

For the last few years, I have been involved in several research projects that were initiated and carried out at the Department of Physics, University of Bahrain with the collaboration of a Bahraini research team. Some international collaboration was achieved with Universities from USA, Europe (Germany, Belgium) and Egypt.

(a) Amorphous Silicon Alloys :

Study of the structural, electrical, optical and photoconductive properties of hydrogenated amorphous silicon alloys a-Si, X:H, where X could be S, Se or C. Some characterizations were performed in collaboration with other institutions (as Max Plank Institute, University of Munich (Germany) and the Catholic University at Leuven (Belgium)).

(b) Chalcogenide Semiconductors :

Study of the density of localized states in the gap of some Chalcogenide amorphous semiconductors by means of infrared and optical modulation spectroscopy as well as through steady-state and transient Photoconductivity. Both stoichiometric and non stoichiometric samples are studied. This work is carried out in collaboration with the Catholic University at Leuven, and RUCA University of Antwerp, Belgium.

(c) Polymer Physics :

Study of the electrical and mechanical properties of polymeric materials. Investigation of the molecular relaxations with the thermal sampling mode of thermally stimulated depolarization currents under different conditions. Our interest goes also to the calculation of the different parameters associated with the dipolar relaxation process. For the mechanical process, we are interested in the creep and stress and strain relaxation behaviors of polymers in the form of strips or fibres. We also study the effect of ion implantation on the different mechanical parameters (e.g. relaxation time, critical strength, and structural sensitive parameters) of some polymers which are of technological interest. This project is carried out in collaboration with the Department of Physics, University of Mansoura, Egypt.

17- CONFERENCES ATTENDED :

- 9th. International Conference on Amorphous and Liquid Semiconductors (9th ICALS), Grenoble, France (1981).
- 10th. International Conference on Amorphous and Liquid Semiconductors (10th ICALS), Tokyo, Japan (1983).
- Materials Research Society (MRS), Fall meeting, Boston, USA, (1985).
- 88th. American Ceramic Society Meeting, Chicago, USA, (1986).
- Materials Research Society (MRS), Spring meeting, Palo Alto, California, USA, (1986).
- School on Polymer Physics, International Centre on Theoretical Physics (ICTP), Trieste, Italy, (1987) [2 Months].
- 11th. Conference on Solid State Science and Application (Assistant Secretary of the Conference), Mansoura University, Egypt, (1988).
- 13th. International Conference on Amorphous and Liquid Semiconductors (13th. ICALS), Asheville, N.C., USA, (1989).
- 1st. World Renewable Energy Congress, Reading, UK. (23-28 Sept., 1990).
- 14th. International Conference on Amorphous Semiconductors (14th. ICAS), Garmisch-Partenkirchen, Germany (9-23 Aug., 1991).
- Organizing Committee of the International Conference on Condensed Matter Physics and Applications, (13-16 April, 1992), Bahrain.
- 2nd. International Conference on Lasers and Applications (Cairo, 16-19 Sept., 1996), Cairo University, Cairo, Egypt (Chairperson).
- CCM'98 (contribution of Cognition to Modelling, 6-8 July 1998, Lyon, France)(Participant and Chairperson).
- Second International Spring School On "Current Activities Of Materials Science", 22-26 April 2000, (Assiut University, Egypt & Tokoho University, Japan) (Session Chairman).
- The 7th International Conference on Solar Energy and Applied Photochemistry (SOLAR'03), 23-28 February (2003) Luxor, Egypt.
- The 225th ACS National Meeting, Polymer Material Science and Engineering, New Orleans, LA, March 23-27, (2003) of ACS.
- The 8th Arab International Solar Energy Conference & Regional World renewable Energy Congress, 8-10 March, 2004, Kingdom of Bahrain.
- International Conference on Materials Science Research and Education, Future Trends and Opportunities, Doha, Qatar – 4-6 April 2005.
- Pakistan, Islam Abad, July 2005
- The Philippines, Jan. 2006

18- PUBLICATIONS (1978 – 2006) :

1. M. Hammam,

M.Sc. Thesis, Mansoura University, Mansoura,

“Study of Some Physical Properties of a Polymer loaded with Different Concentrations of Carbon Black”, (1978).

2. **E.A. Abdel-Bary, S.A. El-Shazly, M. Hammam and M.D. Migahed,**
“Effect of the Concentration of HAF Carbon-Black on the Electrical Conductivity of Polychloroprene”, Mansoura Science Bulletin (Egypt), 7 (1978) 103.
3. **S.A. El-Shazly, E.A. Abdel-Bary, M. Hammam and M.D. Migahed,**
“Electrical Conductivity of Polychloroprene Loaded with Different Types of Carbon-Black”, Mansoura Science Bulletin (Egypt), 7 (1978) 129.
4. **M. Hammam,**
M.Sc. Thesis, Catholic University at Leuven, Belgium,
“Study of X-Ray Fluorescent and Diffraction Phenomena”, (1980). (Not Published).
5. **G.J. Adriaenssens, H. Michiel and M. Hammam,**
“Isothermal Relaxation Currents in Arsenic Chalcogenides”,
Journal de Physique, Colloque C4, Nr. 10 (1981).
6. **G.J. Adriaenssens, M. Hammam, H. Michiel and J. M. Marshall,**
“Spectral Distribution of the Steady-State Photoconductivity in a-As_xSe_{1-x}”, Solid State Commun., 45 (1983) 465.
7. **M. Hammam and G.J. Adriaenssens,**
“Temperature and Excitation Energy Dependence of the Lux-Amper Characteristics in Bulk a-As_xSe_{1-x} samples”, J. Non-Cryst. Solids, 59-60 (1983) 961.
8. **M. Hammam,**
Ph.D. Thesis, Catholic University at Leuven, Belgium,
“Steady-State Photoconductivity in Amorphous Arsenic Selenide Compounds”, (1983).
9. **M. Hammam, G.J. Adriaenssens and W. Grevendonk,**
“Steady-State Photoconductivity in Amorphous Arsenic Selenide Compounds”, J. Physics. C: Solid State Physics, 18 (1985) 2151.
10. **M. Hammam, and J.J. Santiago,**
“Vickers Microhardness Indentation and Fracture Mechanics of Chalcogenide Arsenic Selenium Glasses”, J. Mat. Sci., 21 (1986) 4021.
11. **M. Hammam and J.J. Santiago,**
“Indentation Fracture Properties of Glassy As-Se Bulk Samples”,
Proceeding of the 88th Annual Meeting of the American Ceramic Society (Chicago, IL), April 1986.
12. **M. Hammam, M. Abdel-Harith and W. Osman,**
“Optical Constants of Thermally Evaporated Arsenic Triselenide Using Only Transmission Spectrum”, Solid State Commun., 59 (1986) 271.
13. **M. Hammam and J.J., Santiago,**
“Optical Response of Amorphous As₂S₃ : Melt-Quenched Versus Spin casted Materials”, Mat. Res. Soc. Symp. Proc. Vol. 70 (1986) 719.

14. **M. Hammam and J.J., Santiago,**
“Evidence for As-S Sulfide from Mass Spectrometric Analysis”,
Solid State Communication, 59 (1986) 725.
15. **J.J. Santiago, M. Sano, M. Hammam, and N. Chen,**
“Growth and Optical Characterization of Spin Casted As S Multi-Layer Thin Films”, Thin Solid Films,
147 (1987) 275.
16. **M.D. Migahed, M. Hammam, and M.T.A. Ahmed,**
“The Mechanism of DC Conductivity in ABS Copolymer Thin Films”, Mansoura Science Bulletin
(Egypt) Vol. 15 (1) (1988) 399 and IC-87/91 Internal Report, ICTP, Trieste, Italy (1987).
17. **M.D. Migahed, M. Hammam, M.T.A. Ahmed and H.A. Ashry,**
“ γ -Ray Induced TSDC Spectrum Changes in ABS Terpolymer”, Proceedings of the 1st Egyptian-
British Conference on Biophysics, CAIRO-EGYPT (1987).
18. **M. Hammam, A. Shaban and M. D. Migahed,**
“Correlation Between DC Conductivity and DSC in PVDF (Tr-FE) Copolymer”, Mansoura Science
Bulletin (Egypt) Vol. 15 (1) (1988) 421.
19. **S. Al-Dallal, M. Hammam and S.M. Al-Alawi,**
“Vibrational, Electrical and Optical Properties of Hydrogenated Amorphous Silicon-Sulfur Alloy”. J.
Non-Cryst. Solids 114 (1989) 789.
20. **S. Aljishi, M. Stutzmann, Shu Jin, S. Al-Dallal, C.
Herrero, M. Hammam and S.M. Al-Alawi,**
“Defect Density and Structure of a-Si,S:H Alloys”. J. Non-Cryst. Solids 114 (1989) 462.
21. **M.D. Migahed, A. El-Khodary, M. Hammam, S. Shaban and H.R. Hafiz,**
“Compensation Effect in Styrene-Acrylonitrile Copolymer and Acrylonitrile-Butadiene-Styrene
Terpolymer as Explored by Thermal Stimulated Depolarization Measurements. J. Mat. Sci., 25 (1990)
2795.
22. **M.D. Migahed, S. Shaban, A. El-Khodary, M. Hammam, M. El-Tonsy and H. Hafiz,**
“TSDC Studies on Molecular Relaxation in SAN Films”, J. Polym. Mater, 7 (1990) 131-137.
23. **M. Hammam, G.J. Adriaenssens, J. Dauwen, G. Seynhaeve and W. Grevendonk,**
“Influence of Oxygen on the Electronic Gap-State Density in a-As₂Se₃”. J. Non-Cryst. Solids 119
(1990) 89.
24. **M. Hammam, B. Al-Alawi, H.S. Al-Alawi, S. Al-Dallal, S. Aljishi and M. Stutzmann,**
“Structural and Electronic Properties of Ternary Hydrogenated Amorphous Silicon-Sulfur-Selenium
Alloys”, J. Non-Cryst. Solids 137 and 138 (1991) 911-914.

25. **S. Al-Dallal, S. Aljishi, M. Hammam, S.M. Al-Alawi, M. Stutzmann, S. Jin, T. Muschik and R. Schwarz.**
“High Bandgap Hydrogenated Amorphous Silicon-Selenium Alloys”, J. Appl. Phys. 70 (9) (1991) 4926.
26. **S. Aljishi, S. Al-Dallal, S.M. Al-Alawi, M. Hammam, H.S. Al-Alawi, M. Stutzmann, S. Jin, T. Muschik and R. Schwarz,**
“Electronic Properties of a-Si,Se:H Alloys. Journal of Solar Energy Materials 23 (1991) 334-339.
27. **T. Muschik, R. Schwarz, M. Hammam, S.M. Al-Alawi, S. Al-Dallal, S. Aljishi, M. Stutzmann and S. Jin,**
“Compositional Dependence of Photoluminescence Spectra in Hydrogenated Amorphous Silicon-Sulfur Alloys”, J. Luminescence, 48 and 49 (1991) 641-644.
28. **S. Al-Dallal, M. Hammam, S.M. Al-Alawi, S. Aljishi and A. Breitschwerdt,**
“Infrared Spectroscopy of Hydrogenated Silicon-Sulfur Alloys Prepared by Glow Discharge”, Phil. Mag. B. 63 (1991) 839.
29. **M. Hammam,**
“Preparation and Characterization of Graded Bandgap Amorphous Hydrogenated Silicon-Sulfur Thin Films”, Modern Physics Letter B, 6 (1992) 469.
30. **S. Al-Dallal, M. Hammam, S.M. Al-Alawi and S. Aljishi,**
“Thin Film Hydrogenated Silicon-Sulfur Alloys as Promising Materials for Solar Cell Applications”, Thin Solid Films 205 (1991) 89-92.
31. **S.M. Al-Alawi, M. Hammam, S. Aljishi, H.S. Al-Alawi and S. Al-Dallal,**
“Novel-Stoichiometric Amorphous Silicon-Chalcogen Semi-conductor Alloys”, Proceedings of the VII International Conference on the Physics of Non-Crystalline Solids, Cambridge, UK, 4-9 August (1991) 218.
32. **M. Hammam,**
“Energy Gap States in a-As₄₇S₃₅₃ Non-Stoichiometric Compound”, Arab Journal of Applied Physics and Educations”, 3 (1992) 157.
33. **S. Aljishi, S. Al-Dallal, S.M. Al-Alawi and M. Hammam,**
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