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● **Education**

Ph.D. degree (Microelectronics/Microsystems) (October 2000 – July 2004):

University of Rennes1, Institute of Electronics and Telecommunication of Rennes (IETR), Rennes, France.

Thesis entitled: “Microstructures realized using polycrystalline silicon deposited on glass substrates. Realization and characterization of Air-Gap Thin Film Transistor.

Supervisors: Prof. T Mohamed-Brahim and Dr A-C Salaun.

Master (DEA) of Electronics (1999-2000):

University of Rennes1, France. Dissertation: “Feasibility of high temperature annealing of Poly-Si on glass substrates”.

Bachelor of Science (1991-1995):

Assiut University, Egypt; Major: Physics; Minor: Mathematics.

● **Research interests**

- Electrical, Dielectric and Optical properties of thin films and bulk semiconductors.
- Materials Science for Microelectronics, Micro-Electro-Mechanical Systems (MEMS) and sensors applications.

● **Experience**

- July 2021 – present: Professor at Physics department, Faculty of Science, Assiut University, Assiut, Egypt.
- September 2012 - July 2022: Associate professor at Physics department, College of Science, King Faisal University, Saudi Arabia, a secondment from Assiut University.
- April 2012 – September 2012: Associate professor at Physics department, Faculty of Science, Assiut University, Egypt.
- November 2004 – April 2012: Assistant professor (Lecturer) at Physics department, Faculty of Science, Assiut University, Egypt.
- September 2009 – December 2009: Post-doctor fellow at the Laboratory of Analysis and Architecture of Systems (LAAS)-CNRS, Toulouse, France.
- September 2006 – August 2008: Post-doctor fellow at the Laboratory of Analysis and Architecture of Systems (LAAS)-CNRS, Toulouse, France.
- November 1996 – September 1999: Demonstrator (assistant lecturer) at Physics department, Faculty of Science, Assiut University, Egypt.

Languages

- Arabic
Native language
- English
Professional working proficiency
- French
Professional working proficiency

Skills

- Microtechnology and samples preparation techniques
Masks design, Photolithography, wet and dry etch of materials, Chemical Mechanical Polishing (CMP).
Thermal evaporation, spin coating, sputtering, mechanical ball mill, spark plasma sintering.
- Characterizations and analysis
Optical (spectrophotometer), Electrical, Dielectric (Impedance spectroscopy), Parameters analyzer for discrete devices (MOS, diode, ...), Structural (XRD, SEM, EDX, AFM), Thermal (Differential Thermal Analysis (DTA) and Differential Scanning Calorimetry (DSC)).

Administrative experience

- 2016-2022: Member of Quality assurance committee at the Physics department, Faculty of Science, King Faisal University, Saudi Arabia.
- 2018-2022: Member of safety and **Laboratories** committee at the Physics department, Faculty of Science, King Faisal University, Saudi Arabia.
- 2018-2020: Head of Quality assurance committee at the Physics department, Faculty of Science, King Faisal University, Saudi Arabia.
- 2019-2022: Member of promotion committee at the Physics department, Faculty of Science, King Faisal University, Saudi Arabia.

Research projects

- 1. Project Title: "New method for preparation of Tin-oxide films for gas sensing applications". Funded by the Deanship of Scientific Research of King Faisal University (Grant NO: 150127). (Principle investigator) Status: Finished
- 2. Project Title: "Nano-ceramics of $\text{La}_{0.5}\text{Na}_{0.5}\text{Cu}_3\text{Ti}_4\text{O}_{12}$ by Mechanochemical Milling and sub-sequent Spark Plasma Sintering for Charge Storage Applications". Funded by the Deanship of Scientific Research of King Faisal University (Grant NO: 160162). (Principle investigator) Status: Finished
- 3. Project Title: "Effect of Ba and Y double substitution and spark plasma sintering on the ionic conductivity of $\text{Li}_{5+x+2z}\text{La}_{3-x}\text{Ba}_x\text{Ta}_{2-z}\text{Y}_z\text{O}_{12}$ lithium ion conductors". Funded by the Deanship of Scientific Research of King Faisal University (Grant NO: 180079). (Co-Investigator) Status: Finished

- 4. Project Title: "Thin films of pure and CuO-doped $\text{BaFe}_{0.5}\text{Nb}_{0.5}\text{O}_3$: Dielectric, electrical conduction mechanism and optical properties study for energy storage and microelectronics applications". Funded by the Deanship of Scientific Research of King Faisal University (Grant NO: 180083). (Principle investigator) Status: Finished
- 5. Project Title: "Effect of graphene layers on the morphology and optical properties of the doped zinc oxide and their roles in photo catalytic degradation of industrial pollutant". Funded by the Deanship of Scientific Research of King Faisal University (Grant NO: 180079). (Co-Investigator) Status: Finished
- 6. Leader of research group: Materials for Electronics and sensing Applications (MESA). Funded by the Deanship of Scientific Research of King Faisal University (Grant NO: 1811017). (Principle investigator) Status: Finished.

● Thesis Supervision

- Msc. Program in Solid State Physics

Thesis Title: Influence of doping and processing conditions on the structural, electrical and dielectric properties of $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$ -based ceramics.

Location of Thesis Work: Physics Department, College of Science, King Faisal University.

Student Name: Sara Aldabel

Status: The student has obtained the degree in September 2018.

- Msc. Program in Solid State Physics

Thesis Title: Study of the structural and dielectric properties of $\text{Na}_x\text{A}_y\text{Ni}_{1-x-y}\text{O}$ (A: Si and V) ceramics.

Location of Thesis Work: Physics Department, College of Science, King Faisal University.

Student Name: Nouf Alraheem

Status: The student has obtained the degree in March 2018.

- PhD. Program in Solid State Physics

Thesis Title: Preparation and Characterization of Cd-Se-X Thin Film Alloys.

Location of Thesis Work: Physics Department, Assiut University

Student Name: Mehdi Ahmed Dabban

Status: The student has obtained the degree in 2012.

● Patents

- 1. "Sensor for the detection and/or the measure of charges content in any ambience, usefulness and fabrication process", French Patent 0407583, July 7, 2004.

T. Mohammed-Brahim, A.C. Salaun, F. Le Bihan, H. Mahfoz Kotb, F. Bendriaa, O. Bonnaud.

● Publications

43- "Dielectric Properties of Colossal-Dielectric-Constant $\text{Na}_{1/2}\text{La}_{1/2}\text{Cu}_3\text{Ti}_4\text{O}_{12}$ Ceramics Prepared by Spark Plasma Sintering"

Hicham Mahfoz Kotb, Mohamad Mahmoud Ahmad, Sajid Ali Ansari, Tarek S. Kayed, Adil Alshoabi
Molecules 2022, 27, 779. <https://doi.org/10.3390/molecules27030779>

42- "Colossal Permittivity Characteristics of (Nb, Si) Co-Doped TiO_2 Ceramics"

Hicham Mahfoz Kotb, Adil Alshoabi, Javed Mazher, Nagih M. Shaalan, Mohamad M. Ahmad
Materials 2022, 15, 4701. <https://doi.org/10.3390/ma15134701>

- 41- "Wrinkle-Shaped Nickel Sulfide Grown on Three-Dimensional Nickel Foam: A Binder-Free Electrode Designed for High-Performance Electrochemical Supercapacitor Applications"
Sajid Ali Ansari, Hicham Mahfoz Kotb, Mohamad M. Ahmad
Crystals 2022, 12, 757. <https://doi.org/10.3390/cryst12060757>
- 40- "Green Synthesis of Mn + Cu Bimetallic Nanoparticles Using Vinca rosea Extract and Their Antioxidant, Antibacterial, and Catalytic Activities"
Mohamad M. Ahmad, Hicham Mahfoz Kotb, Shehla Mushtaq, Mir Waheed-Ur-Rehman, Christopher M. Maghanga, MirWaqas Alam
Crystals 2022, 12, 72. <https://doi.org/10.3390/cryst12010072>
- 39- "Enhanced Li⁺ Ionic Conduction and Relaxation Properties of Li_{5+2x}La₃Ta_{2-x}Ga_xO₁₂ Garnets"
Mohamad M. Ahmad, Fatimah R. Al-Ghareeb, Hicham Mahfoz Kotb, Sajid Ali Ansari, Tarek S. Kayed, Hassan A. Khater, Shalendra Kumar, Koji Yamada.
Crystals 2022, 12, 770. <https://doi.org/10.3390/cryst12060770>
- 38- "Dielectric Properties of Bi_{2/3}Cu₃Ti₄O₁₂ Ceramics Prepared by Mechanical Ball Milling and Low Temperature Conventional Sintering"
Mohamad M. Ahmad, Adil Alshoaibi, Sajid Ali Ansari, Tarek S. Kayed, Hassan A. Khater, Hicham Mahfoz Kotb
Materials 2022, 15, 3173. <https://doi.org/10.3390/ma15093173>
- 37- "Ceramic Ti/TiO₂/AuNP Film with 1-D Nanostructures for Selfstanding Supercapacitor Electrodes"
Nagih M. Shaalan, Faheem Ahmed, Mohamed Rashad, Shalendra Kumar, Osama Saber, Abdullah F. Al-Naim, Hicham M. Kotb, Mohammed Ezzeldien, Amara Z. Mahmoud.
Crystals 2022, 12, 791. <https://doi.org/10.3390/cryst12060791>
- 36- "An Effective Photocatalytic Degradation of Industrial Pollutants through Converting Titanium Oxide to Magnetic Nanotubes and Hollow Nanorods by Kirkendall Effect"
Osama Saber, Hicham Mahfoz Kotb, Mostafa Osama, Hassan A. Khater.
Nanomaterials 2022, 12, 440. <https://doi.org/10.3390/nano12030440>
- 35- "Transport and Dielectric Properties of Mechanothesized La_{2/3}Cu₃Ti₄O₁₂ Ceramics"
Mohamad M. Ahmad, Hicham Mahfoz Kotb, Celin Joseph, Shalendra Kumar, Adil Alshoaibi
Crystals 2021, 11, 313. <https://doi.org/10.3390/cryst11030313>
- 34- "Sintering Temperature, Frequency, and Temperature Dependent Dielectric Properties of Na_{0.5}Sm_{0.5}Cu₃Ti₄O₁₂ Ceramics"
Hicham Mahfoz Kotb, Hassan A. Khater, Osama Saber, Mohamad M. Ahmad
Materials 2021, 14, 4805. <https://doi.org/10.3390/ma14174805>
- 33- "Effect of Sm³⁺ Substitutions on the Lithium Ionic Conduction and Relaxation Dynamics of Li_{5+2x}La₃Nb_{2-x}Sm_xO₁₂ Ceramics"
Mohamad M. Ahmad, H. Mahfoz Kotb, Adil Alshoaibi, M. H. Hadj Alouane, Abdullah Aljaafari, Hassan A. Khater
Crystals 2021, 11, 95. <https://doi.org/10.3390/cryst11020095>
- 32- "Dielectric response and structural analysis of (A³⁺, Nb⁵⁺) co-substituted CaCu₃Ti₄O₁₂ ceramics (A: Al and Bi)"
H. Mahfoz Kotb, Mohamad M. Ahmad, Adil Alshoaibi, Koji Yamada
Materials 2020, 13, 5822 (doi:10.3390/ma13245822)
- 31- "Colossal relative permittivity and low dielectric loss in BaFe_{0.5}Nb_{0.5} ceramics prepared by spark plasma sintering"
H. Mahfoz Kotb, Osama Saber, Mohamad M. Ahmad
Results in Physics 19 (2020) 103607 (<https://doi.org/10.1016/j.rinp.2020.103607>)

- 30- "Hydrothermally derived three-dimensional porous hollow double-walled Mn_2O_3 nanocubes as superior electrode materials for supercapacitor applications"
Sajid Ali Ansari, Nazish Parveen, H. Mahfoz Kotb, Adil Alshoaibi
Electrochimica Acta 355 (2020) 136783 (doi.org/10.1016/j.electacta.2020.136783)
- 29- "Improved dielectric properties of $Na_{1/2}Y_{1/2}Cu_3Ti_4O_{12}$ ceramics synthesized by ball-milling and reactive sintering"
H. Mahfoz Kotb, Mohamad M. Ahmad, Adil Alshoaibi, Hassan A Khater, Abdullah Aljaafari
Mater. Res. Express 7 (2020) 026550 (doi.org/10.1088/2053-1591/ab73fb)
- 28- "Designing Dual-Function Nanostructures for Water Purification in Sunlight"
Osama Saber, H. Mahfoz Kotb
Appl. Sci. 2020, 10, 1786; (DOI:10.3390/app10051786)
- 27- "Structural and dielectric properties of giant dielectric $Na_{1/2}Sm_{1/2}Cu_3Ti_4O_{12}$ ceramics prepared by reactive sintering methods"
H. Mahfoz Kotb
Chin. Phys. B Vol. 28, No. 9 (2019) 098202 (10.1088/1674-1056/ab37f1)
- 26- "Dielectric behavior of spark plasma sintered $BaTi_{0.7}Zr_{0.3}O_3$ relaxor ferroelectrics"
Mohamad M. Ahmad, Latifah Alismail, Adil Alshoaibi, Abdullah Aljaafari,
H. Mahfoz Kotb, Reda Hassanien
Results in Physics 15 (2019) 102799 (doi.org/10.1016/j.rinp.2019.102799)
- 25- "Structural and dielectric behavior of Al-substituted $CaCu_3Ti_4O_{12}$ ceramics with giant dielectric constant by spark plasma sintering"
H. Mahfoz Kotb, Mohamad M. Ahmad, Sara Aldabal, Adil Alshoaibi, Abdullah Aljaafari
Journal of Materials Science: Materials in Electronics (2019) 30:18259–18267
(doi.org/10.1007/s10854-019-02180-5)
- 24- "Study of the structural, impedance spectroscopy and dielectric properties of Na and Si co-doped NiO ceramics"
H. Mahfoz Kotb, Mohamad M. Ahmad and Nouf A. Alraheem
J. Phys. D: Appl. Phys. 50 (2017) 435304 (9pp) (DOI.org/10.1088/1361-6463/aa89d8)
- 23- "Electrical and dielectric properties of $Na_{1/2}La_{1/2}Cu_3Ti_4O_{12}$ ceramics prepared by high energy ball-milling and conventional sintering"
H. Mahfoz Kotb and Mohamad M. Ahmad,
Chin. Phys. B Vol. 25, No. 12 (2016) 128201-1-7 (DOI: 10.1088/1674-1056/25/12/128201)
- 22- "Giant dielectric properties of fine-grained $Na_{1/2}Y_{1/2}Cu_3Ti_4O_{12}$ ceramics prepared by mechanosynthesis and spark plasma sintering"
Mohamad M. Ahmad, H. Mahfoz Kotb
J Mater Sci: Mater Electron 266 (2015) 8939-8948.
- 21- "The influence of the substitution of Se for Sn on the thermal, optical and dispersion properties of $Ge_{14}Se_{86-x}Sn_x$ thin films"
H. Mahfoz Kotb, F. M. Abdel-Rahim
Materials Science in Semiconductor Processing 38 (2015) 209–217.
- 20- "Annealing Effects on Structural and Optical Properties of $Ge_{10}Sb_{30}Se_{60}$ Thin Film"
M. M. Hafiz, N. El-kabany, H. Mahfoz Kotb and Y. M. Bakier
Int. J. Thin. Fil. Sci. Tec. 4, No. 3, (2015) 163-171.
- 19- "Determination of Optical Band Gap and Optical Constants of $Ge_xSb_{40-x}Se_{60}$ Thin Films"
M. M. Hafiz, N. El-kabany, H. Mahfoz Kotb and Y. M. Bakier
Int. J. Thin. Fil. Sci. Tec. 4, No. 3, (2015) 179-185.

- 18- "Influence of heat treatment on the structural, optical and electrical properties of Cd₂₀Sn₁₀Se₇₀ thin films"
A.Y. Abdel-latif, H. Mahfoz Kotb, M.M. Hafiz, M.A. Dabban,
Materials Science in Semiconductor Processing 30 (2015) 502–512.
- 17- "Dispersion and optical properties of thermally deposited Se_{91-x}Te₉P_x (x=0, 10) films"
H. Mahfoz Kotb, F. M. Abdel-Rahim, M. M. Hafiz
Thin Solid Films 566 (2014) pp. 54-60.
- 16- "Electrical and mechanical properties of β-hydroxynaphthoic acid–multiwalled carbon nanotubes–polystyrene nanocomposites"
Ayman S Ayesh, SS Ibrahim, Abdullah A Al-Jaafari, Rami A Abdel-Rahem, Nadeem S, Sheikh and H Mahfoz Kotb
Journal of Thermoplastic Composite Materials, (2014) pp. 1–16.
- 15- "Possible two non-linear regions in the I–V characteristics of ZnO varistors"
Sedky, H. Mahfoz Kotb
Current Applied Physics, Volume 13, Issue 9, November 2013, pp. 2117-2122
- 14- "Optical properties of Cd₂₀Se_{80-x}M_x (M: Zn, In, and Sn) thin film alloys"
M.M. Hafiz, H. Mahfoz Kotb, M.A. Dabban, A.Y. Abdel-latif
Optics & Laser Technology, 49 (2013) pp. 188-195
- 13- "Annealing Temperature Dependence of the optical and Structural Properties of Selenium-Rich Cd-Se Thin Films"
H. Mahfoz Kotb, M.A. Dabban, A.Y. Abdel-latif, M.M. Hafiz
Journal of Alloys and Compounds 512 (2012) pp. 115– 120
- 12- "Nano-crystallized tetragonal metastable ZrO₂ thin films deposited by MOCVD for 3D capacitors",
M. Brunet, H. Mahfoz Kotb, L. Bouscayrol, E. Scheid, M. Andrieux, C. Legros, S. Schamm-Chardon.
Thin Solid Films, Vol. 519 (2011) pp. 5638-5644.
- 11- "Thermally induced effects on structural and electrical properties of selenium-rich Cd-Se thin films"
H. Mahfoz Kotb, M.A. Dabban, F.M. Abdel-Rahim, A.Y. Abdel-latif, M.M. Hafiz.
Physica B, 406 (2011) pp. 1326-1329
- 10- "Conception de transistors MOS haute tension (1200 volts) pour l'électronique de puissance"
L. Théolier, H. Mahfoz Kotb, K. Isoird, F. Morancho.
European Journal of Electrical Engineering Vol. 13, N° 2 (2010) 227-252.
- 9- "Factorial experimental design applied to DRIE for optimised process in power electronics applications requiring high-aspect ratio trenches"
Magali Brunet, Pascal Dubreuil, H. Mahfoz-Kotb, Aline Guantes and Anne-Marie Dorthe.
J. Microsystem Technologies, 15, No 9 (2009) pp. 1449-1457.
- 8- "Filling of very deep, wide trenches by BenzoCycloButene polymer"
H. Mahfoz-Kotb, L. Theolier, K. Isoird, F. Morancho.
J. Microsystem Technologies, 15, No 9 (2009) pp. 1395-4000.
- 7- "A New Junction Termination Using a Deep Trench Filled with BenzoCycloButene"
L. Theolier, H. Mahfoz-Kotb, K. Isoird, F. Morancho, P. S. Assié-Souleille, N. Mauraun
IEEE Electron Device Letters, Vol.30, No.6 (2009) pp. 687-689.
- 6- "Sensing sensibility of surface micromachined suspended polysilicon thin film transistors"
H. Mahfoz-KOTB, A-C Salaün, F Bendriaa, F Le Bihan, T Mohammed-Brahim and J R Morante
Sensors and Actuators B, 118 (2006), pp 243-248.

5- "Air-Gap polycrystalline silicon thin film transistors on glass substrates"

H. Mahfoz-KOTB, A-C Salaün, T Mohammed-Brahim, N Coulon and O Bonnaud
Sensors and Actuators A, 113/3 (2004), pp 344-349.

4- "Polycrystalline silicon thin films for MEMS applications"

H. Mahfoz-KOTB, A-C Salaün, T Mohammed-Brahim, F Le Bihan and M EL-Marssi
Thin Solid Films, 427 (2003) pp. 422-426.

3- "Air-Gap polycrystalline silicon thin film transistors for fully integrated sensors",

H. Mahfoz-KOTB, A-C Salaün, T Mohammed-Brahim and O Bonnaud
IEEE Electron Device Letters, Vol. 24, No. 3 (2003) pp. 165-167.

2- "Silicon films deposited by LPCVD for Microsystems",

H. Mahfoz-KOTB, A-C Salaün, T Mohammed-Brahim, F Bendriaa, F Le Bihan and O Bonnaud
Solid State Phenomena, Vol. 93 (2003) pp. 453-458.

1- "Influence of thermal treatments on the crystallization of LPCVD- Si thin films "

A Bachrouri, A. Romano-Rodriguez, J. Li. Alay, A. Vila, J. R. Morante, H. KOTB, R. Rogel, Y. Helen, T. Mohammed-Brahim, M. Sarret and O Bonnaud.

Solid State Phenomena, Vol.s 80-81 (2001) pp. 199-204. (H-index: 32, IF: 0.4, Q3, Publisher: Scientific net, Switzerland, ISSN: 16629779),.

Reviewer for International Journals:

- Journal of the American Ceramic Society
- J Alloys and Compounds
- Physics and Chemistry of Solids
- Materials Science in Semiconductor Processing
- Molecules (MDPI)
- Materials (MDPI)
- Micromachines (MDPI)

References

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