

Research Lab Sheet

Lab Name	The renewable energies lab
Academic Year	2021/2022

Basic Information	
Department	physics
Location	Second floor
Total area (m²)	~ 24 m ²

Lab Members

No. of Prof.	No. of Ass. Prof.	No. of Lect.	No. of Ass. Lect. & Demonst.	No. of technicians
1	1	--	2	--



كلية العلوم
Faculty of Science

حاصلة على شهادة الاعتماد من الهيئة القومية
لضمان جودة التعليم والاعتماد في 2012/7/12م



جامعة سوهاج
University of Sohag

Staff members

#	Name	Scientific degree	e-mail	Specializations	C.V
1	Prof. Dr. Sodky Hamed Mohamed Abo Laila	Professor	abo_95@yahoo.com	Materials Science	https://staffsites.sohag-univ.edu.eg/s.h.mohamed?p=home
2	Dr. Madeha Ahmed Aboelfadle Awad	Ass. Prof.	arwamadeha@yahoo.com	Materials science (nanomaterials)	https://eg.linkedin.com/in/madeha-awad-279490151

Ass. Lecturers & Demonstrators

#	Name	Scientific degree	e-mail	Specializations	
1	Mohamed Asran Hassan	Ass. Lecturer	m.asran@science.sohag.edu.eg	Materials Science	
2	Ayman Ameen	Ass. Lecturer	aiman2017@gmail.com	Theoretical solid state physics	
3					

Theses produced by the Lab

M Sc Thesis			
#	Degree	Title	Approval date
1	B.Sc.	Controlled Growth and Physical Characterization of One Dimensional Tin Oxide Based Nanomaterials	29/04/2018
2	B.Sc.	Theoretical studies on new types of photonic crystals and their applications	2018
3	B.Sc.	Synthesis and characterization of copper oxide and copper oxysulfide nanostructures	7/2020
Ph.D. Thesis			

Articles produced by the Lab

#	Title	Journal information
1	N. M. A. Hadia, A. A. A. Abdelazeez, M. Alzaid, M. Shaban, S. H. Mohamed, B. Hoex, A. Hajjiah, M. Rabia, Converting Sewage Water into H ₂ Fuel Gas Using Cu/CuO Nanoporous Photocatalytic Electrodes	Materials 15 (2022) 1489 (14pp).
2	M. A. Awad, M. Shaban, M. Rabia, The efficiency of M (M = Li, Na, or Cs) doped CdS nanomaterials in optoelectronic applications	Int. J. Energy Res. 2022;1–9. DOI: 10.1002/er.7640
3	N. M. A. Hadia, S. H. Mohamed, W.S. Mohamed, M. Alzaid, M. T. Khan, M. A. Awad, Structural, optical and electrical properties of Bi _{2-x} Mn _x Te ₃ thin films	J. Mater. Sci.: Mater. Electron. 33 (2022) 158–166.
4	N. M. A. Hadia, M. Aljudai, M. Alzaid, S. H. Mohamed, W. S. Mohamed, Synthesis and characterization of undoped and copper-doped zinc	Applied Physics A 128 (2022) 17 (11pp).

	oxide nanowires for optoelectronic and solar cells applications	
5	A.M. Abd El-Rahman, S.H. Mohamed, M.T. Khan, M. A. Awad, Plasmonic performance, electrical and optical properties of titanium nitride nanostructured thin films for optoelectronic applications	J. Mater. Sci.: Mater. Electron. 32 (2021) 28204–28213.
6	M. A. Awad, S. H. Mohamed, S. A. Mohamed, Electrical resistivity and magnetic susceptibility of substoichiometric CdO and In doped CdO films	Appl. Phys. A 127 (2021) 343 (8pp).
7	S. H. Mohamed, M. A. Awad, M. I. Hafez, N. M. A. Hadia, Change in properties upon thermal treatment of copper sulfide powder and thin films	Bull. Mater. Sci. 44 (2021) 81 (11pp).
8	F.M. El-Hossary, S. H. Mohamed, E.A. Noureldein, M. Abo EL-Kassem, ZnO thin films prepared by rf plasma chemical vapor transport for self-cleaning and transparent conducting coatings	Bull. Mater. Sci. 44 (2021) 82 (13pp).
9	S.H. Mohamed, M. T. Khan, A. Almohammed, M. A. Awad, Synthesis, structural and photophysical properties of mixed Zn:SnO ₂ nanowires	Mater. Sci. Semicond. Proc. 123 (2021) 105573.
10	E.M.M. Ibrahim, G.A. Ahmed, V. Khavrus, N.M.A Hadia, S. H. Mohamed, S. Hampel, A.M. Adam, Effect of surfactant concentration on the morphology and thermoelectric power factor of PbTe nanostructures prepared by a hydrothermal route	Physica E 125 (2021) 114396 (6pp).
11	E. M. M. Ibrahim, G. A. Ahmed, V. Khavrus, N. M. Hadia, S. H. Mohamed, S. Hampel, A.M. Adam, Tailoring the thermoelectric properties of Pb _{1-x} Sm _x Te nanostructures via Sm doping	Intermetallics 125 (2020) 106923.
12	F.M. El-Hossary, S. H. Mohamed, E.A. Noureldein, M. Abo EL-Kassem, Influence of rf power on growth, structural and optical properties	Mater. Sci. Semicond. Proc. 120 (2020) 105284 (9pp).

	of ZnO synthesized via vapor transport in inductively coupled plasma	
13	A.M. AbdEl-Rahman, S.H. Mohamed, Properties of SnO_2 and $\text{SnO}_{2-x}\text{N}_x$ grown on the boat walls using vapor transport method	Applied Physics A 126 (2020) 457 (8pp).
14	M. S. Alqahtani, S.H. Mohamed, Z.A. Alrowaili, N. M. A. Hadia, Ellipsometric evaluation and morphology of mixed zinc sulfide/zinc oxide and zinc oxide nanostructures synthesized at various temperatures	Can. J. Phys. 98 (2020) 689-694.
15	A. M. Abd El-Rahman, S. H. Mohamed, Preparation and characterization of nanostructured titanium oxynitride films for the application in self-cleaning and photoelectrochemical water splitting	Thin Solid Films 698 (2020) 137864 (10pp).
16	S. H. Mohamed, H. Zhao, H. Romanus, F.M. El-Hossary, M. Abo EL-Kassem, M.A. Awad, M. Rabia, Yong Lei, Optical, water splitting and wettability of titanium nitride/titanium oxynitride bilayer films for hydrogen generation and solar cells applications	Mater. Sci. Semicond. Proc. 105 (2020) 104704 (7pp).
17	M. Rabia, S. H. Mohamed, H. Zhao, M. Shaban, Y. Lei, A. M. Ahmed, $\text{TiO}_2/\text{TiO}_x\text{N}_y$ hollow mushrooms-like nanocomposite photoanode for hydrogen electrogeneration	J. Porous Mater. 27 (2020) 329.
18	M. S. Alqahtani, N. M. A. Hadia, S. H. Mohamed, Tuning the optical, electrical resistivity and structural properties of DC magnetron sputtered aluminum zinc oxide films by changing the oxygen flow rate	Appl. Phys. A 125 (2019) 776.
19	S. H. Mohamed, N. M. A. Hadia, M. A. Awad, M. I. Hafez, Study of the effects of both film thickness and annealing time on $\text{Cu}_x\text{S}_y\text{O}_z$ thin films for the possibility of usage as solar control coatings	Applied Physics A 125 (2019) 587 (10pp).

20	S. H. Mohamed, N. M. A. Hadia, M. A. Awad and Essam R. Shaaban, Effects of thickness and Ag layer addition on the properties of ZnS thin films	Acta Physica Polonica 135 (2019) 420-425.
21	A. H. Aly, A. A. Ameen, H. A. Elsayed, S. H. Mohamed, M. R. Singh, One-Dimensional Metallo-Superconductor Photonic Crystals as a Smart Window	J. Supercond. Nov. Magn. 32 (2019) 2313–2318.
22	M. A. Awad and A. H. Aly, Experimental and theoretical studies of hybrid multifunctional TiO ₂ /TiN/TiO ₂	Ceramics International 45 (2019) 19036-19043.
23	A. H. Aly, A. A. Ameen, H. A. ElSayed, S. H. Mohamed, Photonic crystal defective superconductor and black body radiations	Opt. Quant. Electron. 50 (2018) 361.
24	M. A. Awad and N. M. A. Hadia, Towards understanding the morphological, magnetic, optical and electrical properties of MnO ₂ nanowires for magneto-and optoelectronic applications	J. Mater. Sci.: Mater.Electron. 29 (2018) 20695–20702.
25	M. S. Alqahtani, N.M.A. Hadia, S.H. Mohamed, Controlled synthesis, morphological, optical and electrical properties of copper-doped zinc oxysulfide nanostructures	Appl. Phys. A 124 (2018) 617 (8pp).
26	M. S. Alqahtani, N.M.A. Hadia, S.H. Mohamed, Effect of oxidation time on structural, optical and electrical properties of mixed copper oxides nanocrystallites	Optik 173 (2018) 101–109.

27	S. H. Mohamed, Kh. M. Al-Mokhtar, Characterization of Cu ₂ O/CuO nanowire arrays synthesized by thermal method at various temperatures	Appl. Phys. A 124 (2018) 493 (8pp).
28	N. M. A. Hadia, M.F. Hasaneen, Mohamed Asran Hassan, S. H. Mohamed, Effect of the carrier gas on morphological, optical and electrical properties of SnO ₂ nanostructures prepared by vapor transport	J. Mater. Sci. - Mater. Electron. 29 (2018) 4155–4162.
29	M. A. Awad and M. Raaif, The disclosed transformation of pre-sputtered Ti films into nanoparticles via controlled thermal oxidation	Appl. Phys. A 124 (2018) 388 (9pp).
30	M. M. Soraya, E. R. Shaaban, M. A. Awad, H. Shokry Hassan, M. I. Eman, H. Algarni	Appl. Phys. A 124 (2018) 197 (11pp).
31	M. A. Awad and M. Raaif, Optical and electrical performance of transparent conductive TiO ₂ /Cu/TiO ₂ multilayers prepared by magnetron sputtering	J. Mater. Sci.: Mater Electron 29 (2018) 2815–2824.
32	M. A. Awad and N.M.A. Hadia, Copper oxide nanocrystallites fabricated by thermal oxidation of pre-sputtered copper films at different temperatures and under oxygen and argon flows	Optik 142 (2017) 334–342.
33	S. H. Mohamed, N. M. A. Hadia, M.F. Hasaneen, M. A. Hassan, Morphologies and optical properties of mixed tin oxysulfide produced by evaporation	Mater. Sci. Semicond. Proc. 72 (2017) 72 – 77.

	condensation of SnS	
34	M. S. Alqahtani, N.M.A. Hadia, S.H. Mohamed, Effects of V doping on magnetic and optical properties of oxygen-deficient In ₂ O ₃ thin films	Optik 145 (2017) 377–386.
35	Arafa H. Aly, Hussein A. Elsayed, Ayman A. Ameen and S. H. Mohamed, Tunable properties of one-dimensional photonic crystals that incorporate a defect layer of a magnetized plasma	Int. J. Mod. Phys. B 31 (2017) 1750239 (9 pages).
36	M. Raaif and S. H. Mohamed, The effect of Cu on the properties of CdO/Cu/CdO multilayer films for transparent conductive electrodes applications	Appl. Phys. A 123 (2017) 441 (7pp).
37	M. S. Alqahtani, N.M.A. Hadia, S. H. Mohamed, Synthesis, optical, structural, and electrical properties of single-crystalline CdS nanobelts	Appl. Phys. A 123 (2017) 298 (9 pp).
38	N. M. A. Hadia, M. A. Awad, S. H. Mohamed, E. M. M. Ibrahim, Optical and electrical properties of hydrothermally prepared CdTe nanowires	Appl. Phys. A 122 (2016) 889 (6pp).
38	S. A. Saleh, A. A. Ibrahim, S. H. Mohamed, Structural and optical properties of nanostructured Fe-doped SnO ₂	Acta Phys. Pol. A 129 (2016) 1220-1225.
40	D. Prakash, E.R. Shaaban, M. Shapaan, S.H. Mohamed, A.A. Othman, K.D. Verm, Thickness-dependent dispersion parameters, energy gap and nonlinear refractive index of ZnSe thin films	Mater. Res. Bull. 80 (2016) 120–126.
41	N.M.A. Hadia, Mohammed S. Alqahtani, S. H. Mohamed, WO ₃ nanowires for optoelectronic and gas sensing applications	Appl. Phys. A 119 (2015) 1261–1267.
42	S. H. Mohamed, N. M. A. Hadia, H. M. Ali, Effect of annealing on properties of decorative zirconium oxynitride thin films	Eur. Phys. J. Appl. Phys. 69 (2015) 30301(6p).

Lab instruments						
#	Device	quantity	Quality			
			Good	Poor	Need maintenance	malfunction
1	Vapor transport deposition system	1	√			
2	muffle furnace, max.Temp 1200°C	1	√			
3	Dc sputter system	1			√	
4	UV lamp source	1	√			

Instruments Description	
Device image	Description /use



The Vapor transport deposition system consists of quartz tube furnace, electrometer, 3 mass flow meters, one argon cylinder, one oxygen cylinder and one nitrogen cylinder. The system can be used to deposit nanostructure d metal oxides, sulfides and metal oxynitrides.



The muffle furnace has a maximum Temperature of 1200°C. The furnace is fully controlled.



The DC sputter system is under construction. It needs a dc power supply and vacuum pump system. It also needs some gas cylinders and targets.



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The UV lamp source has two different wavelengths in the UV spectral range.

Evaluate the fulfillment of lab to appropriateness of areas, building installations, facilities and human resources standards

Areas of assessment		Indicators	Yes	Somewhat	No
Floor area and capacity	1	Adequacy of the total capacity of the lab for the number of researcher (1).	√		
Windows and doors	2	Availability of windows for adequate ventilations.	√		
	3	Ease of use of windows.	√		
	4	There are two exits (doors) at least (2).	√		
	5	There are signs to locate directions of emergency exits	√		
Equipment	6	Appropriate temperature during the lectures (3).	√		
	7	Availability of good ventilation (4).	√		
	8	The existence of adequate lighting (4).	√		
	9	Lab is connected to the Internet	√		
	10	The existence of directions inside the Lab showing entrances and emergency exits.	√		
Security and Safety	11	Existence of firefighting equipment near the hall (5).	√		
	12	Cleanliness of the room.	√		