



## **Dr. Ahmed Salem M. Solieman**

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Nationality: Egypt

Birth Date : 19/05/1970

## Research Interests

- **Deposition of thin films** using different physical and chemical techniques
- **Chemical synthesis of metal oxide nanoparticles**
- **Physical properties of nanostructured films** (Semiconductors and metal oxides)
- **Modelling the optical and electrical properties of thin films**
- **Transparent conductive coatings for solar cells and optoelectronic devices**
- **Film patterning using photolithographic**

## EDUCATION

**2005** PhD. in Physics Faculty of science, Al-Azhar University, Egypt in cooperation with INM (Institute of New Materials), Saarbrucken, Germany. Dissertation title: "**Characterization and Simulation of ITO Nanoparticulate Coatings on Glass/Plastic Substrates**".

**1999** **M. Sc.** in Physics, Faculty of science, Assiut University, Egypt. Thesis title: "**Characterization and properties of chalcogenide CuInSe thin films**"

**1992** **B.Sc.** in Physics with **Very good** evaluation, Faculty of science, South Valley University, Egypt.

## CAREER HISTORY

**2007-present** **Assis. Prof.** of Physics, Faculty of Science, Taibah University, KSA.

**2005 - 2007** **Permanent Assis. Prof.** of Physics, Faculty of Science, Al-Azhar University, Egypt.

**2002 - 2005** **PhD** Student in Department of Coating Technology, INM (Institute of New Materials), Saarbrucken, Germany.

**1999 - 2002** **Lecturer assistant** in Physics Dept. Faculty of science El-Azhar Uni., Assiut, Egypt

**1995 - 1999** **Demonstrator** in Physics Dept. Faculty of science El-Azhar Uni., Assiut, Egypt.

**1994 - 1995** **Physicist** in Arab Contractors Company, Egypt.

## RESEARCH EXPERIENCES

<b><i>Nanopowder and bulk</i></b>	<p>Expert in preparing amorphous semiconductors alloys and chalcogenide glasses by melt-quenching technique.</p> <p><b>Skilled</b> in wet chemical synthesis of nanocrystals (co-precipitation, hydrothermal processes).</p> <p><b>Professional in</b> preparation of different phases of conductive ITO nanopowders.</p>
<b><i>Coatings and thin films</i></b>	<p>Use of sol-gel techniques (Doctor blade, spin and dip coating) to deposit thin films on different substrates.</p> <p>Dispersion of ITO nanoparticles in solvents by roll milling and microfluidizer techniques and hydrolysis of methoxysilane groups (MPTS, GPTS, and TEOS ).</p> <p>Use Edward's coating unit and Denton vacuum unit to deposit different alloys by thermal evaporation (one or two sources) on glass substrates.</p> <p>Patterning of ITO layers by UV light and UV and CO<sub>2</sub> laser beam irradiation.</p> <p>Thermal and UV curing processes of coatings</p>
<b><i>Measurements</i></b>	<p><b>Capable of measuring and interpreting the following</b></p> <ul style="list-style-type: none"> <li>• Optical data of thin films using spectrophotometer and ellipsometric and FTIR spectroscopy</li> <li>• Electrical properties using four probe and Hall Effect.</li> <li>• Structure and phase analysis using XRD, EDX</li> <li>• Nanoparticle density and its specific BET surface area.</li> <li>• using WLI (White Light Interferometer) microscopy</li> </ul>
<b><i>Calculations and analysis</i></b>	<p>Using SCOUT2 software for Modelling of optical and electrical properties of thin conducting films.</p> <p>Analysis of XRD patterns of glass, powder and thin film.</p> <p>Optical constants (refractive index, extinction coefficient and optical band gap) of thin films.</p>
<b><i>Skills:</i></b>	<p><b>Computer skills</b></p> <ul style="list-style-type: none"> <li>• <b><i>Operating Systems:</i></b> MSDOS, Windows 95/98/NT, Windows XP</li> <li>• <b><i>Scientific Applications:</i></b> SCOUT2, Origin</li> <li>• <b><i>Office Applications:</i></b> Microsoft PowerPoint, Excel, Word, Publisher</li> </ul> <p><b>Language skills</b></p> <ul style="list-style-type: none"> <li>• Arabic (Mother) - English (very good) - German (Fair)</li> </ul>
<b>Projects:</b> 177,000 (SR)	<p><b>"Preparation of transparent conductive oxides (TCOs) thin films by using the Sol-gel technology"</b> by Scientific research deanship at Taibah University.</p>
1,181,760 (SR)	<p><b>"Hydrothermal process preparation of cubic and corundum ITO nanocrystals for fabricating transparent conductive layers on glass and plastic substrates"</b> By King AbdelAziz City for Science and Technology (KACST) in Saudi Arabia.</p>

## ORAL & POSTER PRESENTATIONS:

### A.Solieman

"Sol-Gel Based Deposition of Cubic and Corundum Structure Nanocrystalline ITO Films"  
4th Saudi Conference of Science, 21-24 March 2010, Medinah, Saudi Arabia

### A.Solieman and A.A. Abu-Sehly

"Modelling of optical properties of amorphous As-S thin films: Effect of composition"  
4th Saudi Conference of Science, 21-24 March 2010, Medinah, Saudi Arabia.

### A.Solieman and M. Aegerter

"Modelling of optical and electrical properties of In<sub>2</sub>O<sub>3</sub>:Sn coatings" 5th ICCG - International Conference on Coatings on Glass, July 4 – 8, 2004, Saarbruecken, Germany

## PUBLICATION LIST

- 19 A. Solieman, M. K. Zayed, S.N. Alamri, and *A.A., Joraid*  
"sol-gel based deposition and characterization of pure and Al doped ZnO films" under construction (2011).
- 18 A. Solieman, M. K. Zayed, S.N. Alamri, N. Al-Dahoudi, M. A. Aegerter  
"Corundum nanostructure ITO film fabrication: an approach for physical properties assessment" *J. Mater. Chem Phys.*, revised version was submitted, (2011).
- 17 Saleh A. Ahmed, Zeinab A. Hozien, Aboel-Magd A. Abdel-Wahab, Shaya Y. Al-Raqa, Abdulrahman A. Al-Simaree, Ziad Moussa, Saleh N. Al-Amri, Mouslim Messali, Ahmed S. Soliman, Heinz Dürr  
"Photochromism of dihydroindolizines. Part 16: Tuning of the photophysical behavior of photochromic dihydroindolizines in solution and in polymeric thin film" *Tetrahedron* 67 (37) (2011) 7173-7184
- 16 A. Solieman  
"Effect of sintering temperature on the structural, optical and electrical properties of sol-gel derived indium oxide thin films" *J. Sol-gel Science and Technology*, 60 (2011) 48–57
- 15 A. Solieman and A.A. Abu-Sehly,  
"Determination of the optical constants of amorphous As<sub>x</sub>S<sub>100-x</sub> films using effective-medium approximation and OJL model " *J. Mater. Chem Phys.*, 129 (3) (2011) 1000 – 1005
- 14 *A.A., Joraid , S.N., Alamri , A., Solieman , A.A., Abu-Sehly*  
"Dielectric modelling of the transmittance spectra of thin As<sub>20</sub>S<sub>80</sub> films" *Optics & Laser Technology* 43 no7 (2011) 1243 - 1248
- 13 A. Solieman, S. Alamri and M. A. Aegerter  
"Synthesis of corundum structure ITO nanocrystals by hydrothermal process" *J. Nanoparticles Research* 12 (2010) 2381.
- 12 A. Solieman and A.A. Abu-Sehly,  
"Modelling of optical properties of amorphous As-S thin films: Effect of composition" 4<sup>th</sup> Saudi Conference of Science, 21-24 March 2010, Medinah, Saudi Arabia.
- 11 A. Solieman and A.A. Abu-Sehly,  
"Modelling of optical properties of amorphous Selenium thin films" *Physica B* 405 (2010) 1101.

- 10 **A. Solieman**, A.H. Moharram and M. A. Aegerter  
"Patterning of nanoparticulate transparent conductive ITO films using UV light irradiation and UV laser beam writing" *App. Surf. Sci.* 256 (2010) 1925
- 9 S.N. Alamri, A.A. Joraid, **A.S. Solieman**, Sh.Y. Al-Raqa, A.A. Mohamed  
"Structural and optical properties of 1, 4, 8, 11, 15, 18, 22, 25-octahexylphthalocyanine: A comparison between thermally evaporated and spin-coated thin films" *J. Taibah University for Science*, 1, (2008) 35-43.
- 8 S.Y. Al-Raqa, **A. S. Solieman**, A.A. Joraid, S.N. Alamri, A. Aljuhani,  
"Preparation and optical properties of novel symmetrical hexadecachlorinatedphtalocyaninato zinc(II) spin coated thin films" *Polyhedron* 27 (2008) 1256-1261
- 7 **Solieman A.**, Aegerter M.A.  
"Modeling of optical and electrical properties of In<sub>2</sub>O<sub>3</sub> :Sn coatings made by various techniques" *Thin Solid Films* 502 (2006) 205-211
- 6 **Solieman A.**,  
"Characterization and Simulation of ITO Nanoparticulate Coatings on Glass/Plastic Substrates" PhD Thesis, Al-Azhar Univ, Egypt, 2005.
- 5 M.A. Aegerter, N. Al-Dahoudi, **A. Solieman**, H. Kavak, P. Oliveira  
"Transparent conducting coatings made by chemical nanotechnology processes"  
Proceedings of the 7<sup>th</sup> ICFPAM, June 10-15, 2003 Bucharest Romania, special issue of *Molecular Crystal and Liquid Crystal*, vol. 417 (2004) 105 -114.
- 4 Naji Al-Dahoudi, **Ahmed Solieman** and Michel A. Aegerter  
"Properties of transparent conducting coatings (TCO) made by chemical nanotechnology process"  
-105<sup>th</sup> Annual Meeting & Exposition of The American Ceramic Society, April 27 – 30, 2003, Nashville/TA, and  
- *Ceramic Nanomaterials and Nanotechnology II Ceramic Transactions*, Volume 148, 2004.
- 3 A.H. Moharram , I.M. Al-Mekkawy and **A. Salem**,  
"Optical Properties and Structural Changes of Thermally Co-evaporated CuInSe Films" *Applied Surface Science*, 191 (2002) 85.
- 2 A.H. Moharram , M.M. Hafiz and **A. Salem** ,  
"Electrical Properties and Structural Changes of Thermally Co-evaporated CuInSe Films" *Applied Surface Science* , 172 (2001) 61
- 1 **A. Salem**,  
"Characterization and properties of chalcogenide CuInSe thin films"  
M.Sc. thesis, Assiut Univ., Egypt, 1999.

## REFEREES

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