



## Hagar Khalil Hassan Ibrahim

Curriculum Vitae

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**Current Position:** Assistant lecturer, Chemistry department, Faculty of Science, Cairo University.

### Education:

- **Master of Science:** Chemistry department, Faculty of Science, Cairo University, 2012.

**Title of thesis:** "Surface modified electrode with graphene for catalytic and sensor applications" under supervision of Dr. Ahmed Galal Helmy, professor of physical chemistry, Faculty of Science Cairo University.

- **Bachelor of Science:** Chemistry, faculty of Science, Cairo University (2005-2009)
  - Excellent with distinctions.

### Research Experience:

**Cairo University, Faculty of Science, Department of Chemistry, Cairo Egypt (2010 to present)**

- Chemical and electrochemical characterization and synthesis of graphene and its functionalization with different nanostructure materials.
- Electrocatalysis: electrochemical oxidation of small organic molecules used in fuel cell applications such as methanol, ethanol and formaldehyde.
- Electrochemical sensing: construction new sensors based on graphene/nanoparticles and graphene/polymer via a simple and rapid method for several neurotransmitters and drugs.
- Electrochemical, surface and structural characterizations of graphene and many other nanostructure materials.
- Electrochemical polymerization of conductive polymers over graphene surface
- Corrosion study and protection of metals: protection of stainless steel surface against corrosion using graphene and functionalized graphene surfaces.
- Electrochemical energy storage: currently I am working on synthesis of different graphene/nanostructure materials via an environmentally friendly method for their applications on the area of supercapacitors.
- Hydrogen production using graphene/perovskite nanocomposites.

**Joint Institute for Nuclear Research, Dubna, Moscow Region, Russia (2011-2013)**

- Molecular dynamic simulation of chemical and biological systems using Amber and DL-Poly packages.

## Awards and Honors:

### Postgraduate awards:

- Best MSc thesis award in the Faculty of Science for the academic year 2012-2013 2014

### Undergraduate awards:

- Egyptian Syndicate of Scientific Professions Shield 2010
- Faculty of Science, Cairo University award for the top -10 Faculty students 2010
- Prof. Dr. Hamed Khalefa award for the top 10 chemistry department students 2010
- Prof. Dr. Nabil M. Hassan award for the first chemistry department student 2010
- Prof. dr. Ezzat M. Khiry award for the first chemistry department student 2010
- Prof. dr. Mohamed El-Khalfawy award for the first chemistry department student 2010
- Best presentation in the graduation project seminar 2009
- Schlumberger award for the highest grade second year student 2007

## Workshops and Conferences

- 1- Horizon 2020 information day, 2015.
- 2- Royal Society of Chemistry, RSC, information day, 2015.
- 3- GSAS workshop on Catalysis, Qatar, 5-8 Jun., 2013.
- 4- LinkSCEEM Cross-sectional HPC (high performance computation) Workshop, Faculty of Computers and Information, Cairo, Egypt and American University in Cairo, Egypt, Nov. 10-15, 2013.
- 5- Molecular dynamics study of ethanol solvated by water on the Pt (111) surface, presentation Talk, Japan–Russia International conference MSSMBS 12 "Molecular Simulation Studies in Material and Biological Sciences", September 9-12, JINR, Dubna, Moscow Region, Russia, 2012.
- 6- Biannual international conference of chemistry department, Chem. 06, 2010.
- 7- Biannual international conference of chemistry department, Chem. 05, 2008.

## Publications:

### Published Journal papers:

- 1- Rapid and simple electrochemical detection of morphine on graphene-palladium-hybrid-modified glassy carbon electrode. Nada F Atta, Hagar K Hassan, Ahmed Galal, Analytical and Bioanalytical Chemistry, 406 (2014): 6933-6942.
- 2- Electrodeposited nanostructured Pt-Ru co-catalyst on graphene for the electrocatalytic oxidation of formaldehyde, Hagar K. Hassan, Nada F. Atta, Ahmed Galal, Journal of Solid State Electrochemistry, 17 (2013) 1717-1727.
- 3- Structural and Diffusional Study of Pure Ethanol and Water on Pt (III) Surface Using Molecular Dynamic Simulation, Kholmurzo Kholmurodov, Ermuhammad Dushanov, Kenji Yasuoka, Hagar K. Hassan, Ahmed Galal, Sameh Ahmed, Nasser Sweilam, Hatem Moharram, European Chemical Bulletin, 2013, 2(5), 247-254.

- 4- Graphene Supported-Pt-M (M = Ru or Pd) for Electrocatalytic Methanol Oxidation, Ahmed Galal, Nada F. Atta, Hagar K. Hassan, International journal of Electrochemical Science, 7 (2012) 768 – 784.
- 5- Molecular dynamics study of ethanol solvated by water on a Pt surface, Kholmirzo Kholmurodov, Ermuhammad Dushanov, Kenji Yasuoka, Hagar Khalil, Ahmed Galal, Sameh Ahmed, Nasser Sweilam, Hatem Moharram, Chemical Physics, 402, (2012) 41-47.
- 6- Nanocomposite Graphene-Based Material for Fuel Cell Applications, Ahmed A. Elzatahry, Aboubakr M. Abdullah, Taher A. Salah El-Din, Abdullah M. Al-Enizi, Ahmed A. Maarouf, Ahmed Galal, Hagar K. Hassan, Ekram H. El-Ads, Salem S. Al-Theyab and Attiah A Al-Ghamdi, International journal of Electrochemical Science, 7 (2012) 3115 – 3126.
- 7- Electropolymerization of Aniline Over Chemically Converted Graphene-Systematic Study and Effect of Dopant, Hagar K. Hassan, Nada F. Atta, Ahmed Galal, International journal of Electrochemical Science, 7 (2012) 11161 – 11181.
- 8- Molecular dynamics simulation of the interaction of ethanol-water mixture with a Pt surface, Kholmirzo Kholmurodov, Ermuhammad Dushanov, Kenji Yasuoka, Hagar Khalil, Ahmed Galal, Sameh Ahmed, Nasser Sweilam, Hatem Moharram, Natural Science 3 (2011) 1011-1021.

**Manuscripts under revision/submitted:**

- 1- High electrocatalytic activity of graphene supported Pt-Pd/Ru for ethanol oxidation; Electrochemistry and characterization, Hagar K. Hassan, Ahmed Galal, Nada F. Atta, submitted.
- 2- Graphene supported Pt-Pd co-catalyst for the enhanced electrooxidation of formaldehyde, Hagar K. Hassan, Ahmed Galal, Nada F. Atta, submitted.
- 3- A green, simple and one-pot synthesis of LaFeO<sub>3</sub>-graphene for hydrogen production application; Graphene oxide is an efficient oxidizing agent. Hagar K. Hassan, Ahmed Galal, Nada F. Atta, submitted.
- 4- Green method for preparation of Ru/reduced graphene oxide for high-performance supercapacitor in neutral electrolyte, Hagar K. Hassan, Ahmed Galal, Nada F. Atta, submitted.

**Book Chapters contributions:**

- 1- Ahmed Galal, Nada F. Atta, Hagar K. Hassan, Graphene as Electrochemical Sensor and Biosensor: Synthesis, Characterization and Applications. In: Nada F. Atta (ed.), *Nanosensors; Materials and Technologies*, (pp.25-63), IFSA Publishing, 2013.
- 2- Kholmirzo T. Kholmurodov, Ermuhammad B. Dushanov, Evgenii A. Krasavin, Hagar K. Hassan, Hadeer A. ElHabashy, Ahmed Galal, Nasser H. Sweilam, Kenji Yasuoka, "Molecular Dynamics Simulations of the DNA Interaction with Metallic Nanoparticles and TiO<sub>2</sub> Surfaces. In: Kholmirzo T. Kholmurodov (ed.), *Bioscience and Materials Research: Molecular Dynamics and Related Techniques*, (pp. 167-201), Nova Science Publishers (N.Y.), 2013.

### Projects and grants:

- 1- Member of #304 cooperation project between Egypt and Russian since 2011, which includes joint research papers, internships and conference attendance.
- 2- Participated as a researcher in “Nanocomposite Graphene-Based Material for Fuel Cell Applications” project that was supported by King Saud University, Deanship of Scientific Research, College of Science Research Center, 2011.

### Teaching Experience

- **Assistant Lecturer:** at Chemistry department (physical chemistry subdivision), Faculty of Science, Cairo University (since 2013).
- **Teaching Assistant:** at Chemistry department (physical chemistry) Faculty of Science, Cairo University (from 3/2010 till 11/2012).

Chem 101 (General chemistry lab).

Chem 102 (Introduction to Physical Chem. Lab).

Chem 211(Physical chem. Lab: Thermodynamics).

Chem 212 (Physical chem. Lab: Practical reversible electrochemistry).

Chem 481 (Physical chem. Lab: Chemical kinetics).

Chem 483 (Physical chem. Lab: Electrochemistry, conductivity, spectroscopy, Refractrometry and Polarimetry).

### Training, Courses and internship:

- Exams and student evaluation system course at FLD center of Cairo University, 11<sup>th</sup> Feb. to 12<sup>th</sup> Feb., 2013.
- Six weeks internship at Joint institute for nuclear research (JINR) for training to use AMBER for molecular dynamic simulations and QM/MM calculations, Laboratory of Radiation biology, JINR, Dubna, Russia, 4<sup>th</sup> Aug. to 16<sup>th</sup> Sep., 2012 (Internship).
- Project preparation for competitive research funding course at FLD center of Cairo University, 20<sup>th</sup> -22<sup>nd</sup> May, 2012
- International publication of scientific research course at FLD center of Cairo University, 11<sup>th</sup> -13<sup>th</sup> Feb., 2012.
- Three weeks internship at Joint institute for nuclear research (JINR) for training to use DLPoly for molecular dynamic simulation, Laboratory of Radiation biology, JINR, Dubna, Russia, 16<sup>th</sup> Sep to 3<sup>rd</sup> Oct., 2011.
- Effective presentation skills course at FLD center of Cairo University, 12<sup>th</sup>-14<sup>th</sup> Sep., 2011.
- Effective Teaching course at FLD center of Cairo University, 6<sup>th</sup> -8<sup>th</sup> June, 2011.
- Linux -Administration course at Faculty of Engineering, Cairo University, 20<sup>th</sup> April-23<sup>rd</sup> May, 2011.
- Linux -Essential course at Faculty of Engineering, Cairo University, 23<sup>rd</sup> March – 7<sup>th</sup> April, 2011.
- Time management course at FLD center of Cairo University, 3<sup>rd</sup> -5<sup>th</sup> May 2010.

- Using technology in teaching, course at FLD center of Cairo University, 20<sup>th</sup> -22<sup>nd</sup> Sep., 2010.

**Leadership/services skills:**

- Helping some of master students in our research group by training, guiding and following up them in their researches.
- Helping undergraduate students by creation Facebook groups to contact with them:  
<https://www.facebook.com/groups/chem211lab/>  
<https://www.facebook.com/groups/chem101lab/>  
<https://www.facebook.com/groups/Chem212lab/>
- Co-founder of “minutescience” YouTube channel that is responsible for simplifying the scientific information in different fields and making tutorial videos for undergraduate chemistry students:  
<https://www.facebook.com/MinitesciArarb>  
<https://www.youtube.com/channel/UCDvDZQxq7beFLB8K9GiwC5w>
- Volunteer in Resala charity.

**Other skills:**

- Language skills: very good (Writing and Speaking) in English language and beginner in Germany.
- I can deal with the following scientific computer programs (Sigmaplot, Origin, DLPOLY, Amber and VMD) additionally; I have some of the basics of C and C++ programming language.