

Kasem K. Kasem (Ph. D)
School of Science (Chemistry)
Full Member of Graduate Faculty at Indiana University
Professor of Physical/Analytical Chemistry
Indiana University Kokomo
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Summary of Qualifications:

University faculty for more than 30 years. Research and Development in the field of applied Photo-electrochemistry. Physical and analytical applications of chemically modified electrodes. Semiconductors' electrochemistry. Electrochemical behavior of polymeric thin films. Activation and Metallization of polymers. Electro-deposition of metals and alloys. Corrosion.

Research Activities and Interests:

Efficient use and transformation of energy have been one of my research activities and goals. I have been working in the area of photo-induced charge transfer process at modified semiconductor's surface (Thin films, colloidal, or nano-size particles) with structured or molecularly designed interfaces. My primary goal is to attain efficient capturing of free solar energy and its utilization in hydrogen production in particular.

Based on My current and previous extensive experience in electrochemistry, my goal is to develop an active research program for graduate/undergraduates in the field of photo-electrochemistry, and electro-catalysis.

Please see the attached Research and Teaching Statements.

Education:

B.Sc. (7/71) Chemistry

School of Science, Assiut University, EGYPT

M.Sc. (11/75) Electrochemistry

School of Science, Assiut University, EGYPT

Ph.D. (7/78) Electrochemistry

School of Science, Assiut University, EGYPT

Post-Doctoral (1986/88) (photo-electrochemistry) School of Science, Cornell University, NY
Post-Doctoral (1988/89) (charge transfer) School of Science, Purdue University, IN

Teaching Experience:

Graduate Research in Chemistry, Undergraduate Research in Chemistry
Instrumental Methods of Analysis (400/500 level)/Lab
Physical Chemistry (200 & 300 level)/Lab. Inorganic Chemistry
Analytical Chemistry (300 level)/Lab.
Inorganic Chemistry (400 level)
General Chemistry. Introductory Chemistry for non-chemistry majors.

HONORS AND AWARDS:

Indiana University research Award, 2009 , and 2014
The CLAUDE RICH EXCELLENCE IN TEACHING Award 2000.
DEPARTMENT OF THE NAVY-ASEE 2000
INDIANA UNIVERSITY TEACHING EXCELLENCE AWARD 1997,1999.
CORNELL UNIVERSITY Postdoctoral 1986-1988
PURDUE SCHOOL OF SCIENCE Postdoctoral 1988-1989.

PROFESSIONAL EXPERIENCE:

Professor of Chemistry **2003-present**
Associate professor of Chemistry **1997- 2003**
Assistant professor of Chemistry **1991-1997**
Division of Biological & Physical Sciences
Indiana University Kokomo.

Assistant professor of Chemistry (Sabbatical Replacement) **1989-1990**
Chemistry Department Indiana State University, Terre Haute, IN

Postdoctoral Research associate **1988-1989.**
Chemistry Department, IU-PUI, Indianapolis, and West Lafayette, IN

Postdoctoral Visiting scientist **1986-1988.**
Chemistry Department, Cornell University, Itacha, NY

Assistant professor of Chemistry **1981-1986**
Chemistry Department, Al Fateh University, Tripoli , Libya

Lecturer of Chemistry **1978-1981**
Chemistry Department, Assiut University, Assiut, Egypt

RESEARCH SUPERVISION OF GRADUATE & UNDERGRADUATE STUDENTS:

3 Master , 4 Ph.D

More than 26 Students Participated in My Undergraduate research projects.

EVALUATION EXPERIENCE:

Member of IUK All campus Promotion & Tenure Committee for 6 years .

Member of Faculty Affair Committee for 4 Years.

Chair of research Affair committee

RESEARCH ACTIVITIES:

The following summarizes my research effort since 1972;

- 1991-Now** I have been working in the area of photo-induced charge transfer process at modified semiconductor's surface (Thin films, colloidal, or nano-size particles) with structured or molecularly designed interfaces. Research projects on the electrochemical behavior of free and immobilized polyoxo-metalates in aqueous and mixed solvent electrolytes. Photo electrochemistry of inorganic and organic semiconductors. Electrocatalytic activities of these polyoxometalates. URSI projects on electro- chemical application of chemically modified electrodes as biosensor enzyme electrodes).
- 1989-1990** Electrochemical studies (Purdue University, West Lafayette) on the lipophile exchange membranes as electro-active assemblies on the electrode surface.
- 1988-1989** NSF research project (West Lafayette/ Indianapolis), in characterization of electro-chemical behavior of transition metal complexes Dynamic voltammetric techniques, and chemically modified electrodes are being used to characterize rates and mechanisms of electrode reactions.
- 1986-1988** Research project at Cornell University (Ithaca, NY) on application of modified electrodes in trace analysis; coordination trends, the selectivity and sensitivity of

such electrodes were also studied. Photoelectrochemical studied of native semiconductor electrodes for solar energy conversion the quantum conversion efficiencies of photoelectrochemical cells were also characterized.

- 1983-1986** Collaborative research work with the Ministry of Industry and Al-Fateh University (Tripoli, Libya) in the electrical properties of inorganic phosphates and their polymers. Polymers of either Ti or Zr phosphate or mixed metal phosphates were prepared and investigated with respect to their electrical conductivity.
- 1978-1983** Collaborative research work at Assiut university in electro-organic synthesis of some organic acids and esters and electro-reduction of ketones using surface derivatized electrodes. Designed electrodes for biological and organic solutions. Studied non-toxic baths for electrodeposition of some transition metals. Co-operative research project with Industrial & Financial Co.(Quna, Egypt) in the corrosion studies of some of their products (metals and alloys). Co-supervised two M.Sc thesis.
- 1975-1978** Anodic preparation of bulk and surface attached films of oxides on Al and Al-Mn alloys in organic and inorganic acid baths. These systems were characterized by X-ray diffraction and by electrochemical instrumentation. Thermodynamic functions were calculated from the data analysis of temperature variations in these systems. Possible applications for preparation of porous and microelectrodes, as well as ceramics were also investigated.
- 1972-1975** Electrodeposition of some binary alloys of Cd-Ni. The study which, was a part of my M. Sc. degree covered the analytical and physical aspects of the electroplating process. Anti-corrosion properties of these alloys under marine environments were also investigated.

PUBLICATIONS: (Not all of my research work was published; some of it was kept for confidential use of the employer)

SELECTED ARTICLES: (The following articles are published in refereed Journals)

- ‘Electrochemical studies on a photoactive semiconductor organic/inorganic hybrid interface consisting of a poly tris [4-(2-thienyl) phenyl] amine and CdS nanoparticles.’, **Synthetic Metals** **2016** (217), 61-67.

- “Creation of Photoactive Inorganic/Organic interface s using Occlusion Electrodeposition Process of Inorganic nanoparticles during electropolymerization of 2,2',5,2''–Terthiophene “ , **International journal of Chemistry** , **2016** (8) 2, pp1-8.
- **“Photoelectrochemical, and Magnetic Studies on Photoactive Interface Assemblies of Poly Dithiophene (PDTh)/Poly 2 Thionyl Aniline (2ThA)/ Ferromagnetic Mg-doped Fe₂O₃.in Aqueous Electrolytes.” , in prepublication review 2016**
- * " Photoelectrochemical Studies on Aqueous Nano Suspensions of Some metal oxides/Chalcogenides Semiconductors for hydrogen production. Effecient harvesting of Solar Energy" , Bulletin of Material Sciences, 2015, 38 (2) pp303-308
- “Photoelectrochemical Studies on High Specific Capacitance- Photoactive Interfaces Based on poly 3,4 Ethylenedioxythiophene/Metal Oxides Assemblies. J. Material sciences and chemical engineering , 2015, 3, 88-97
- * “ Photo-electrochemically active inorganic/organic interface s consists of Zn-Doped WO₃/poly4-(thiophene-3-yl) aniline. “ . International Journal of chemistry , 2015, 7(1), pp 146-154.
- “Photoelectrochemical studies on Inorganic/organic Aqueous nano-Suspensions made by TiO₂/Poly neutral Red Assembly” , Mediterranean Journal of chemistry, **2014**, 3(3), 883-893.
- “Photoelectrochemical Studies at TiO₂/Poly 2-Anilino 1,4 Naphthoquinone Interfaces “ . Journal of surface and Interface materials, **2014** , 2, 1-7 .
- * "Photoelectrochemical Studies on TiO₂ -Doped Ce (III/IV) Oxides Nanoparticles in Aqueous Electrolytes " , Material Seiences and Applications , **2013**, 4, 737-643.
- * "Photoelectrochemical Studies on CdS/Poly Ethyl -Aniline Interfaces " , International Journal of Chemistry, **2013**, Vol. 5(3), 76-86.
- * " Photoelectrochemical Studies on Aqueous Nano Suspensions of Some metal oxides/Chalcogenides Semiconductors for hydrogen production. Effecient harvesting of Solar Energy. 11th international Conference On chemistry and Its Role in Development, Mansura -Sharm El-Sheikh March , **2013** Page 73.

* " Photoelectrochemical and Spectroscopic Studies of Colloidal Nano-Particles of Mixed TiO₂ / V₂O₅ Metal- Oxide Semiconductors ". Material Science and Application, **2012** ,3,265-271 .

* "Role of Platinum in Photoelectrochemical Studies Related to Solar Energy Harvesting", Platinum Metal Review , **2012**,56(4), 221-228.

* "Photoelectrochemical Studies at CdS/PTTH Nanoparticles Interfaces" . Material Science and Application, **2012** ,3, 719-727.

* "Photoelectrochemical Production of Hydrogen in Aqueous Suspensions Nanoparticles Composites of CdS/ZnS" . Material Science and applications , **2011**,2, 1631-1638.

- "Photoelectrochemical Production of Hydrogen in Aqueous Suspensions Nanoparticles Composites of CdS/ZnS" . Material Science and applications , 2011, 2, 1631-1638.
- * "PHOTO-ELECTROCHEMICAL STUDIES ON AQUEOUS SUSPENSIONS OF 3-DODECYL 2-5 DI- THIONYL PYRROLE/ METAL OXIDE PHOTOACTIVE INTERFACES" .Surface and Interface Science , Volume 43, Issue 12, pages 1527–1531.
- " PHOTO-ELECTROCHEMICAL STUDIES ON COPPER (I) OXIDE THIENYL PYRROLES INTERFACES ” . International Journal of material Science , 3, 2011 , 321-330.
- “Photoelectrochemical Studies on Aqueous Suspensions of Mixed CdS/ZnS Nanoparticle Composites for Hydrogen Production ” Cairo 12th International conference in Energy & Environment , 2011
- Photodissociation of water using colloidal nanoparticles of doped titanium (IV) oxide semiconductors for hydrogen production. Current Science , 99(8), 2010, 1087-1092
- “Hydrogen Production by Selective Photo-dissociation of Water in Aqueous Colloidal Nano-particles of Doped Iron (III) Oxides Semiconductors” . J. Mat. Sci. & Techno., 2010, 26(7), 619-624.
- “ELECTROCHEMICAL STUDIES ON METAL-HEXACYANO COBALATE (III) THIN SOLID FILMS IN AQUEOUS ELECTROLYTES” J. Mat. Sci. Poland , 2010, vol.28(2), pp439-449.

- “Photolysis of Aqueous Colloidal Zinc Oxide Nanoparticles for hydrogen production” CACS, 2010, 4(1), 13-17.
- "Photoelectrochemical Studies on Poly 1-(2-Aminophenyl)Pyrrole: Creation of a Photoactive Inorganic /Organic Semiconductor Interface (IOI) ". Canadian J. of chem., **2009, 87, 1109-1116.**
- “Selective Photolysis of aqueous colloidal nano-particles of some metal oxide semiconductors for hydrogen production”. Oriental journal of Chemistry, **2009, 25, 1-6**
- “Photo-generation of Hydrogen from Aqueous Colloidal Nano-particles of Some Metal-Oxides Semiconductors” . Proceeding of Cairo 11th international conference, and 8th world solar electricity, **2009.**
- Photo-electrochemical Studies on Poly 1-(2-Aminophenyl Pyrrole): Creation of Photoactive Inorganic /Organic Semiconductor Interface (IOI)" Material science An Indiana journal In press.**2009**
- * “Platinum as reference Electrode in electrochemical measurements”. Platinum Metals Review, 52 (2), 2008, 100-106.
- * “Photo-electrochemical Studies on copper Oxides/Chalcogenides Semiconductors” 10th. International Conference on energy and environment, 2007
- * “ Electrochemical behavior of Hexacyano Iron (III) In frozen Aqueous electrolytes” American Journal of undergraduate research. 2006, 5(4) 25.
- * " Electrochemical Behavior Of some Redox Systems pendant in Agar Gel". *J. of New materials for Electrochemical Systems*, 2005, 8(3), 189-195.
- * "Electrochemical, Catalytic behavior of Iridium hexacyanometalates thin film in aqueous electrolytes. *Platinum Metals Review*, 2004, (48)4, 159-167.
- * Electrochemical Synthesis of Zeollite-like Ruthenium Based Hexacyanometalates Multi-film Assemblies. *J. Microporous and Mesoporous Materials*, 66, **2003**,133-141 .
- * Electrochemistry in Thin Solid Films of Prussian Blue; A Model Demonstration of Reversible Behavior. Kasem K.. Kasem Et al, *American Journal of undergraduate*

Research , 2(1), **2003**, 27-36.

- * Electrochemical Studies on Substituted Iron-Hexacyano iron (III)Bi-Layered Thin Films at Glassy Carbon Electrode/Electrolyte Interface. **J. Interface Science**, 10, **2002**.261-269
- * Electrodeposition of Catalytically active mixed solid film of hexacyanoferrate and decavanadates". K. Kasem, *J. Applied Electrochemistry* , 31, **2001**,1125-1129.
- * Electrochemical Behavior of iron-hexacyanoruthenate(II) thin films in aqueous electrolytes: potential analytical and catalytic applications. K. Kasem, *Material Science & Engineering B*,83, **2001**, 97-105
- * Electrochemical and Adsorption Studies on the Formation of Poly 8-Hydroxyquinoline Thin Films at Glassy Carbon /Electrolyte Interface. K. Kasem, *J. Interface Sciences*, 8, **2000**, 111-121.
- * Photoelectrochemical Studies on Stationary surface Modified CdSe electrodes. *J. Mat. Sci. &Eng. B*65. **1999**, 127-134.
- * Electrodeposition of Doped Solid Film of Phosphomolybdates. K. Kasem, *J Applied Electrochemistry*,29, **1999**, 1471-1473
- * Photo-electrochemistry at Polymer/Semiconductor Interface. Characterization of Surface Modified CdS Based Photovoltaic Cells. K. Kasem, *J. Material Science*, 34,**1999**,5273-5242.
- * Modified electrodes with synthetic bio-catalytic membrane. Kasem Kasem, Josie Sheets, and Natalie Koon. *Biotechnol. Progress*, 14, **1998**, 791-796.
- * Electrochemical behavior of Sodium 12-Tungstodicoaltoate in aqueous and mixed solvent electrolytes. K. Kasem, *J. of Electrochimica Acta*, 41(2), **1996**, 205-211
- * Effect of both electrode material and polymer configuration on the performance of the electrochemical sensor based immobilized enzyme electrode. Kasem K. Kasem, Josie Sheets and Natalie Koon, *Annali di Chimica*, 86, **1996**, 449-461.
- * Electrochemistry of Polyoxometalates Immobilized in Ion Exchange Polymers Films. K. Kasem and F.A Schultz, *Canadian Journal Of Chemistry*, 73, **1995**, 858-864.
- * Modified electrodes for electrocatalysis. Kasem K. Kasem and F.A. Schultz.

Proceedings of the *Indiana Academy of Science*, 104(3-4), **1995**, 185-192.

- * Ion Exchange and Charge transport Properties of Polymeric Tris(4-vinyl-4'-methyl-2,2'-bipyridine) ruthenium(II) Films. Kasem K. Kasem and F.A Schultz, *J. of Inorganic and Organometallic polymers* , 4(4) **1994**, 377-390 .
- * Solvent Effects on the Redox Behavior of Silicotungstates in Mixtures of Some Oxoanions and Their Potential Analytical Applications. Kasem K. Kasem, *Annali Di Chimica*, 84, **1994**, 365-377..
- * Effect of the anodization current density and time on the corrosion of Al-Mn alloy. Abou-El-Wafa, Moustafa H.M.; El-Cheikh, Hesham Mansour, F.M.; Kasem, K.K.. *Commun. Fac.Sci. Univ. Ankara, Ser. B: Chem. Chem. Eng.* (**1994**), 36(1-2), 27-35.
- * Effect of Competitive Binding on the Amperometric Determination of Copper with Electrodes Modified with Chromotrope 2B. K.K. Kasem and H.D. Abruna. *Talanta* 38(1) **1991**, P. 89-93 .
- * Lipophile Exchange Membranes as Electroactive Assemblies on Electrode Surface. K.K. Kasem, M. Zelden, W. Fife, and Charlis R. Leinder. *J. of Electroanalytical Chemistry*. 296, **1990**, P221-231.
- * Effect of some trimethine merocyanine dyes on the corrosion of aluminum and aluminum manganese. Abou-El-Wafa, Moustafa H. M.; Mansour, Hesham; El-Cheikh, F. M.; Kasem, K. K.. *Pak. J. Sci. Ind. Res.* (**1990**), 33(5-6), 208-12.
- * Anodization of aluminum and some of its alloys in organic and inorganic acids Mansour, Hesham; Abou-El-Wafa, Moustafa H. M.; El-Cheikh, F. M.; Kasem, K. K. *J. Indian Chem. Soc.*(**1989**), 66(12), 908-10.
- * Role of acid concentration on the anodic film properties of aluminum and aluminum-manganese alloy. Abou-El-Wafa, Moustafa H. M.; Mansour, Hesham; El-Cheikh, F. M.; Kasem, K. K.. *J. Indian Chem. Soc.* (**1989**), 66(12), 858-61
- * Effect of the anodization current density and time on the corrosion of aluminum and aluminum-manganese alloy. Abou-El-Wafa, Moustafa H. M.; Mansour, Hesham; El-Cheikh, F.M.; Kasem, K. K. *Pak. J. Sci. Ind. Res.* (**1989**), 32(6), 366-9.
- * Electroanalysis with Modified Carbon Paste Electrodes; Coordination Trends, Selectivity and Sensitivity. K.K. Kasem, Hector D. Abruna. *J. of Electroanalytical*

Chemistry. 242, **1988**, 87,

- * Efficiency of alkylamines in retarding the dissolution of electrolytic cadmium. Noubi, G. A.; Gahli, H.; Kasem, K.; Mansour, H. *J. Electrochem. Soc. India* (**1982**), 31(4), 182-7.
- * Effect of Aliphatic Acid Anions on the Standard Potentials of Calomel Like Electrodes. K.K. Kasem, *Annali di chimica*, 72, **1982**, 503-9.
- * Additional Physical Properties of Butyrate and Iso-Butyrate Anions. K.K. Kasem and M.T. Esmail, *Revue Roumaine de Chimie*, 27, **1982**, 479.
- * Electrosynthesis of Organic Compounds I-Synthesis Succinic, Adipic, and Suberic Acids, and their Methyl Esters. Ismail, M.T., K.K. Kasem, and Abdel-Wahab. A.A. *Bull. Sci. Assiut University*, 11(1), **1982**, 121-6.
- * The Electrodeposition of Zn and Ni in the Presence of Acetylacetone; the Behavior of Ligand as Both an inhibitor and Depolarizer. M.M. Aly, f.M. El-chiek, K.K. Kasem, and H.M. Kilia. *J. of the Indian Chemical Society*, 57(12), **1980**, 1223-5.
- * Electrodeposition of Cd-Ni Alloys from Solutions Containing Organic Anions. M.M. Aly, F.M. El-Chiek, and K.K. Kasem. *Revue Roumaine de Chimie*. Vol. 24, **1979**, 506.
- * The Effect of Halides on the Corrosion of Zinc in Acidic Medium. F. El-Chiek, G. Nobi, and K. Kasem. *Bull. of Sci. Assiut University*. 7(1). **1978**, 1
- * A Study on the Effect of Amino Acids on Al-Mn Alloy Corrosion in HCl Solution. F. El-Chiek, G. Nobi, and K. Kasem, *Bull. of Faculty of Sci. Assiut University*. 7(1). **1978**.
- * A Glycinate Bath for Cd-Ni Alloys. F. El-Chiek, I.M. Issa, and K. Kasem. *Annali di Chimica*. Vol. 67. **1977**.

ON GOING RESEARCH ENDEAVOR :

Continue to work on synthesis and characterization of Organic and inorganic semiconductors

PAPERS AT NATIONAL / INTERNATIONAL MEETINGS

2015 *Mansura University 12th international conference on chemistry and its role in development*

- 2013** *Mansura University 11th international conference on chemistry and its role in development*
- 2009** *11th international conference on Energy and environment, March , 2009, Urghardga , Egypt*
- 2007** *Tenth international conference on Energy and environment, Luxur, Egypt March 2007.*
- 2001** **28th Annual Conference of FACSS (Ferd. Of Analyt. Chem. & Spect. Soc.), Detroit, Michigan**
 - Electrochemical Charge Exchange.
- 1993** **International Electroanalytical Symposium, Indianapolis, IN**
 - Electroanalytical determination of silicotungstates in a mixture of some oxoanions; Solvent effect criteria.
 - Electrochemical behavior of Sodium 12- Tungstodicobaltoate in aqueous and mixed solvent electrolytes.
- 1989** **American Chemical Society (197th) Dallas, TX**
 - Ion exchange and charge transport properties of polymeric Ru(vppy)₃ films.
 - Incorporation and electrocatalytic properties of polyoxometalates in ion exchange polymer films.

Undergraduate Research

2001-14 ACS regional meetings, Dow AgroSciences, Indianapolis, IN.

-Dirrenet topics in Photo-Electrochemical studies on Inorganic/organic interfaces (Students: Trent Miller, and Angela Zimmerman, RYanne Hazen, Margaret Rosanne Spaulding, Carmen Davis, Stephni Jons, Heather Ramey, William Bennit, Nick Daanan, Waleed Ahmed, Mellissa Dhan,, Neda Zia Aubrey Fenny)

2000 National Conference on Undergraduate Research, University of Montana.MT.

-Elechemical behavior of some immobilized hexacyanometalates.
 (Students, A Croxford, D, henninger, and F. Phetteplace)

- 1999 National Conference on Undergraduate Research, Rochester, New York.**
 -Electrochemical studies on Poly 2-Aminophenyl Pyrrole in aqueous electrolytes.
 (Student: Sarah Menages)
- 1998 National Conference on Undergraduate Research, Baltimore, MD**
 -Electrochemical behavior of free and immobilized 9- Tungesto 3- Vanado- Phosphate in aqueous and mixed solvent electrolytes.
 (Student Laura Canon)
- 1997 National Conference on Undergraduate Research, Austin , TX.**
 - Electrochemical behavior of some mixed addendia.
 (Students: Becky Boardman, Robin Carter)
- 1996 National Conference on Undergraduate Research, Asheville, NC.**

 -Surface modification of glassy carbon electrodes.
 -Polyoxometalates -based polymer films as modifier for electrode surfaces.
 (Students: Jo Rousseau, Gena Morandi)
- 1995 National Conference on Undergraduate Research, Schenectady, NY.**

 -Modified Glassy carbon electrodes' surfaces as electrochemical sensor for enzyme-substrate interaction.
 (Students: Natali Koon, and Josie Sheets)
- 1994 National Conference on Undergraduate Research, Kalamazoo, MI.**

 -Enzyme electrode based immobilized glucose oxidase in polymer films.
 (Student: Josie Sheets)

INVITED SEMINARS AND PRESENTATIONS

- 1- Plenary Lecture on Photoelectrochemistry at Inorganic/organic interfaces ,theory and Applications. 2015 Mansura University 12th international conference on chemistry and its role in development , Sharm El-Chiekh , Egypt (March 16-20, 2015)***
- 2- T.J Research Center, IBM, NY.

" Ion exchange and charge transport at chemically modified electrode"
- 3- University of Toledo, Department of Chemistry

"Analytical application of chemically modified electrodes"

4- Indiana University Northwest, Department of Bio.& Phys. Sci.

"Charge transfer in polymeric films"

5- Eastern Illinois University, Department of Chemistry **"Chemically modified electrodes"**