Current Address

The Chemical and Petrochemicals Engineering Department, Egypt-Japan University of Science and Technology, P.O. Box New Borg El-Arab City, Alexandria 21934, Egypt

Current Contact Info

Phone ++20-14-541-1234 Mobile
++20-2-5673-6561 (Work)
++20-2-3587-2914 (Home)

E-mail abubakr_2@yahoo.com

Aboubakr Moustafa Abdullah, Ph. D.

Objective

To apply for research grants

Professional experience

December 2010 – present *Chemical and Petrochemicals Engineering Department, Egypt-Japan University of Science and Technology, New Borg El-Arab City, Alexandria, Egypt*

Job Title: Associate Professor

September 2010 – Nov. 2010 *Chemistry Department, Faculty of Science, University of Cairo, Giza, Egypt*

Job Title: Associate Professor

Dec. 2009 – August 2010 *Chemistry Department, Faculty of Science, University of Cairo, Giza, Egypt*

Job Title: Assistant Professor

- Teaching Chem318 “Introduction to Physical Chemistry of Polymers”.
- Supervising Chemistry Labs.
- Studying antibacterial and antitumoric corrosion inhibitors for ferrous and non ferrous alloys.
- Passivation of Ti alloys.
- Preparing and using grapheme/nanoparticles systems.

Jan. 2009 – Nov. 2009 Chemistry Department, The University of Calgary, 2500 University Dr., NW Calgary, Alberta T2N 1N4, Canada.

Job Title: Research Associate

- My work there was twofold; (i) functionalizing mesoporous carbon (FMC) with aminophyenyl compounds then loading the FMC with nano Pt particles. Functionalization carbon before loading the nano particles will prevent segregation when working at 90 ^{o}C within a polymer electrolyte membrane fuel cell (PEMFC). In this work, I have used X-ray diffraction spectroscopy (XRD) and several electrochemical characterization techniques including the electrochemical impedance spectroscopy (EIS).
- (ii) Also, I am working on the liquid phase impregnation of Ni microparticles within yttria stabilized zirconia (YSZ) for a tubular anode supported solid oxide fuel cell (SOFC). This work necessitates using scanning electron microscopy (SEM), surface conductivity and EIS characterization techniques.
- Besides the aforementioned work, I am supervising two Ph.D. students. One of them is working on Al anodization and the other is working on developing non precious catalysts for PEMFCs.

Oct. 2006 – Jan. 2009 Electronic Chemistry Department, Tokyo Institute of Technology, 4259 – G1-05 Nagatsuta, Midori-Ku, Yokohama 226-8502, Japan.

Job Title: Research Associate

- In August 2006, Prof. Takeo Ohsaka hired me to work on a research project for electrochemically characterizing new catalysts in different hydrogen/air polymer electrolyte membrane fuel cells. Besides characterization of new catalysts, my work was also directed to study the local degradation of the membrane electrode assembly (MEA). This project is funded by the NEDO (New Energy and Industrial Technology Development Organization).
- This job required measuring the characteristic *I* - *E* relationships for the fuel cell under study. Also, EIS for finding the membrane resistance under different operating conditions was used.
- Also, I have measured the local temperature profiles and current distributions within segmented PEMFC using thermocouples and many zero resistance ammeters (ZRA).
- In addition, I measured the pH of the water drained out the cathode and the anode compartments and correlated this to the performance and the

degradation of the Nafion membranes and used the pH of the drained water as an alarm for the onset of the chemical degradation of the Nafion membranes beside using it quantitatively to estimate the chemical degradation.

- Also, I have worked on the effect of SO_2 gas on the kinetics of the oxygen reduction reaction at GC/nano Pt modified electrodes. Different average sizes of Pt nanoparticles were prepared using the double potential step technique by controlling the time and the potential.
- Beside my work on PEM fuel cells, I have worked also on production of ozone using Novel titanium and tantalum oxide electrodes which have high O_3 production efficiency.
- During my research at Tokyo Institute of Technology, I used the EIS, rotating ring disk electrode (RRDE), Rotating disk electrode (RDE), cyclic voltammetry (CV), XPS, XRD, SEM and Potentiometry.
- My activities at TIT also include the supervising of a Master student at Tokyo Institute of Technology.

Jan 2006 – Nov. 2006 *Chemistry Department, Faculty of Science, University of Cairo, Giza, Egypt (full time)*

Job Title: Lecturer (Assistant Professor)

- This Job required teaching, making exams and grading them for the students.
- Teaching Chem212 "Electrochemistry of Solutions" (Ionics) for sophomore students.
- I was delegated to teach PHCM102 "physical chemistry" for October 6th University freshmen dentistry students.
- Teaching Physical Chemistry Lab for the chemistry department senior students
- Supervising the Chemistry Lab for predentol students.

March 2004 – Jan. 2006 *Chemistry Department, Faculty of Science, Kuwait University, B.O. Box 5969, Safat 13060, Kuwait*

Job Title: Research Associate

- In March 2004, I was invited to work on a research project funded by Kuwait University. The target of this project is studying the pollution of sulfide ions and its effects on the efficiency of the corrosion inhibitors used for copper and its alloys.
- Besides working on this project, I was working also on the use of electrochemical techniques in environmental engineering. For example, testing and removing of sulfide and polysulfide ions from water by electrochemical deposition (oxidation) of micro and nano sulfur particles on graphite electrodes.
- This research necessitated the use of Electrochemical Quartz Nano

Balance (EQNB), XPS, SEM, and many electrochemical techniques including the EIS and CV techniques. Also the potentiodynamic technique was used on both stationary and rotating disk electrode systems.

Oct. 2003 – March 2004 *Chemistry Department, Faculty of Science, University of Cairo, Giza, Egypt*

Job Title: Assistant Professor

- This Job required teaching, making exams and grading them for the Chemistry Department's junior and sophomore students.

Nov. 1998 – June 2003 *Materials Sci. & Eng. Dept., The Pennsylvania State University, University Park, PA 16802*

Job Title: Research and Teaching Assistant

- In 1998, I received an assistantship to pursue my Ph.D. from Prof. Howard W. Pickering and Prof. Barbara A. Shaw at The Pennsylvania State University. My research, conducted for Alcoa, Inc., concentrated on the environmental degradation (crevice and Intergranular corrosion) of some newly developed aluminum alloys.
- This research required creation of microprobes (0.15 mm in diameter) for in situ measuring the potential drop, pH, and chloride ion concentrations within narrow crevices and cavities. Additionally, I used the SEM and in situ digital optical microscope in this research to create videos for the intergranular corrosion development.
- I used XRD, XPS, EQNB and the Hydrogen Permeation Techniques efficiently.
- I also created Pourbiax diagrams for aqueous aluminum systems manually and using software package.
- I have worked a teaching assistant (TA) for the following courses for the senior students of the Metals Section in the Materials science and Engineering Department; Intensive corrosion summer course, Failure Analysis, Electrochemistry of Corrosion, and Hydrometallurgy.
- I used many software packages including: Microsoft Office, Mathematica, EndNote, Adobe Acrobat, Adobe PhotoShop, Math Cad, Front Page, Netscape Composer, and Sigma Plot.
- I Created and updated Web pages.

1993 – 1998 *Chemistry Department, The University of Cairo, Giza, Egypt*

Job Title: Research and Teaching Assistant

- I developed a functionalized electrode by the electropolymerization technique. I also used the CV for the electrochemical characterization of this newly developed metal-complex conducting polymer electrode. I used the electrocatalytic features of the conducting polymer electrode for the determination of very low concentrations of some organic pollutants e.g. epinephrine and catechol and some neurotransmitters e.g. ascorbic acid and dopamine.
- I used infrared spectroscopy (IR) and XPS to characterize the electropolymerized films.
- I taught many lab classes in the Inorganic and physical Chemistry Sections in the Chemistry Department at The University of Cairo for the freshmen, sophomores, juniors and seniors' students. For example, Qualitative Analysis, Quantitative Analysis, Instrumental Analysis, and Physical Chemistry classes. Besides teaching to the Chemistry Department students, I taught Qualitative Analysis lab classes for the freshmen students of The Faculty of Pharmacology, The Faculty of Dentistry and The Faculty of Veterinary Medicine.
- In addition to the teaching responsibilities, I prepared and graded exams for all the lab classes I had taught.

Education

1998 – 2003 *Materials Sci. & Eng. Dept., The Pennsylvania State University, University Park, PA 16802*

Doctor of Philosophy with High Honors in Materials Science and Engineering, Metals Science Option.

GPA is 3.91

The Thesis title is "The Use of Microelectrodes in the Study of Localized Corrosion of Aluminum 6111-Like Alloys".

1994 – 1997 *Chemistry Department, The University of Cairo, Giza, Egypt*

Master of Science in Physical Chemistry (Electrochemistry).

The thesis title is " Metal-Complex Modified Conducting Polymer Electrode; Characterization and Sensory Application"

1989 – 1993 *Chemistry Department, The University of Cairo, Giza, Egypt*

Bachelor Degree in Chemistry with High Honors. My GPA was one of the seven best GPAs out of four hundred students during these four

years.

Publications & Professional Presentations

1. Aboubakr M. Abdullah, Ahmad M. Mohammad, Takeyoshi Okajima, Fusao Kitamura, and Takeo Ohsaka , "Effect of Relative Humidity on the Current and Temperature Distributions within a 5-5 Segmented H_2/Air PEM Fuel Cell", accepted for oral presentation at The 219th ECS meeting, Montreal, Quebec, Canada, May 1-6, (2011).

2. A. Tawfik, A. Salem, M. El-Qelish, Aboubakr M. Abdullah, E. Abou Taleb , "Feasibility of Biological Hydrogen Production from Kitchen Waste via Anaerobic Baffled Reactor (ABR)", Int. J. Sustainable Water and Environmental Systems 2 (2011) 117 – 122.

3. Aboubakr M. Abdullah, Dustin W. Banham, Felicia Feng, S. Gharaibeh, K. Pei and Viola I. Birss *Electrochemical Study of Surface-Functionalized Carbon Support Materials*, Poster presentation at the 217th Electrochemical Society Meeting, Vancouver, BC, Canada, April 25-30, (2010).

4. Aboubakr M. Abdullah, Mahmoud M. Saleh, Mohamed I. Awad, Takeyoshi Okajima, Fusao Kitamura and Takeo Ohsaka, *Temperature effect on the recovery of SO_2-Poisoned GC/Nano-Pt electrode towards oxygen reduction*, J. Solid St. Electrochem., 14 (9) 1727 (2010).

5. Ahmad M. Mohammad, Aboubakr M. Abdullah, Bahgat E. El-Anadouli, and Suzanne Mohney, ~~*Template assisted growth of rhodium nanowire contacts to silicon nanowires*~~, Int. J. Nanomanufacturing, 4 (1-4), 146 (2009).

6. Ahmad M Mohammad, Kenta Kitsuka, Aboubakr M Abdullah, Mohamed I Awad,Takeyoshi Okajima, Kazuhiro Kaneda, Mineo Ikematsu, Takeo Ohsaka, *Development of spin-coated Si/TiOx/Pt/TiOx electrodes for the electrochemical ozone production*, *Appl. Surf. Sci.*, *255, 8458 (2009).*

7. Aboubakr M. Abdullah and Viola I. Birss, *Liquid Phase Impregnation of Ni into porous YSZ tubes*, Poster presented at The SOFC Canada Meeting at the University of Calgary, June 24 – 27, 2009.

8. Aboubakr M. Abdullah, Ahmad M. Mohammad, Takeyoshi Okajima, Fusao Kitamura and Takeo Ohsaka, *Effect of Load, Temperature, and Humidity on the pH of the Water Drained out from H_2/Air PEM Fuel Cells.*, *J. Power Sources*, *190, 264 (2009).*

9. Aboubakr M. Abdullah, Takeyoshi Okajima, Fusao Kitamura and Takeo Ohsaka, *Effect of Operating Conditions on the Acidity of H_2/Air PEM Fuel Cells' Water*, The 214th Electrochemical Society Meeting in Hawaii, USA, October 12 – October 17, 2008.

10. Aboubakr M. Abdullah, Takeyoshi Okajima, Fusao Kitamura and Takeo Ohsaka, ~~*Effect of Operating Conditions on the Acidity of H_2/Air PEM Fuel Cells' Water*~~, ECS Transactions, 16 (2) 543-550

(2008).

11. Aboubakr M. Abdullah, Takeyoshi Okajima, Fusao Kitamura and Takeo Ohsaka, *A Simple In-situ Characterization Technique for the Onset of the Chemical Degradation of PEM Fuel Cells' Fluorinated Membranes*, Electrochem. Commun., 10, 1732 (2008).

12. Aboubakr M. Abdullah, Ahmad M. Mohammad, Taeyoshi Okajima, Fusao Kitamura and Takeo Ohsaka, *Effect of Relative Humidity on the pH of Water within PEM Fuel Cells*, 17th Meeting of The Japan Institute of Energy, 4 – 25, Tokyo Urban Tech University, Tokyo, August 4 – 5, 2008

13. Bayoumi, F. M., A. M. Abdullah, B. Attiya, *Kinetics of Corrsion inhibition of Benzotriazole to Copper in 3.5% NaCl*, Mater. Corros., 59 (8) 691-696 (2008).

14. A. M. Abdullah, T. Okajima, F. Kitamura and T. Ohsaka, *Local Temperature Profiles within a Segmented H_2/air PEM Fuel Cell*, *Fall Meeting of The Electrochemical Society of Japan, 1A32, Ookayama campus , September 19 – 20, 2007.*

15. A. M. Mohammad, M. I. Awad, A. M. Abdullah, K. Kitsuka, K. Kaneda, M. Ikematsu, T. Okajima, and T. Ohsaka, *Electrocatalytic Enhancement of Ozone Electrogeneration on Spin-Coated Titanium Oxide Electrodes*, *Fall Meeting of The Electrochemical Society of Japan, 2F30, Ookayama Campus, September 19 – 20, 2007*.

16. A. M. Abdullah, T. Okajima, A. M. Mohammad, F. Kitamura and T. Ohsaka, *Temperature Gradients Measurements within a Segmented H_2/air PEM Fuel Cell*, *J. Power Sources*, 172, 209 (2007).

17. A. M. Mohammad, K. Kitsuka, K. Kameda, M. I. Awad, A. M. Abdullah, M. Ikematsu and T. Ohsaka, ~~*Superior Electrocatalysis of Spin – Coated Titanium Oxide Electrodes for the Electrochemical Ozone production,*~~ *Chem. Lett.*, 36, 1046 (2007).

18. B. G. Ateya, F. M. Al-kharafi, A. S. Al-Azab and A. M. Abdullah, *Kinetics of the electrochemical deposition of sulfur from sulfide polluted brines, J. App. Electrochem., 37, 395 (2007).*

19. F. M. Al-Kharafi, A. M. Abdullah and B. G. Ateya, *A Quartz Crystal Microbalance Study of the Kinetics of Adsorption of Benzotriazole on Copper*, *J. App. Electrochem., 37, 1177 (2007).*

20. F. M. Al-Kharafi, A. M. Abdullah, I. M. Ghayad, and B. G. Ateya, *Effect of sulfide pollution on the stability of the protective film of benzotriazole on copper*, *Appl. Surf. Sci., 253, 8986 (2007).*

21. Aboubakr M. Abdullah, Faiza M. Alkharafi and Badr G. Ateya, *Intergranular Corrosion of Copper in the Presence of Benzotriazole*, Scripta Mater., 54, 1673 (2006)

22. Faiza M. Al-kharafi, Aboubakr M. Abdullah and Badr G. Ateya, *Extraordinary Effects of Benzotriazole and Sulfide Ions on the*

Corrosion of Copper, Electrochem. Solid St., 9, B19 (2006).

23. M. I. Abdulsalam, A. M. Abdullah, B. G. Ateya and A. Bairamov, ~~*Active and Passive Behavior of Iron Electrodes with Artificial Crevices*~~, J. Eng. Appl. Sci., 52, p.183 (2005).

24. Faiza M. Al-kharafi, Badr G. Ateya, A. S. Al-Azab and Aboubakr M. Abdullah, ~~*Performance of some electrode materials for electrochemical treatment of sulfide polluted brines,*~~ Int. J. Chem., 15, 113 (2005).

25. Faiza M. Al-kharafi, Aboubakr M. Abdullah and Badr G. Ateya, *Corrosion and protection of Copper in Sulfide Polluted Media*, The Arab School Workshop, Dec. 3rd-7th 2005, Kuwait.

26. F. M. Al-kharafi, A. M. Abdullah, and B. G. Ateya, Corrosion and Inhibition of Copper in Sulfide Polluted Media, presented at The Egyptian Corrosion Society Meeting, Dec. 4th- 9th 2004, Shokhna, Red Sea, Egypt.

27. M. K. Sawford, B. G. Ateya, A. M. Abdullah, H. W. Pickering, *The Role of Oxygen on The Stability of Crevice Corrosion*, J. Electrochem. Soc., 149, B198-B205 (2002).

28. B. A. Shaw, M. M. McCosby, A. M. Abdullah and H. W. Pickering, *The Localized Corrosion of Al 6xxx Alloys*, JOM, 53, 42 (2001).*

29. A. M. Abdullah, H. W. Pickering, B. A. Shaw, *The Sources of Active Peaks in Some Aluminum/Electrolyte Systems,* The Electrochemical Society Meeting, San Francisco, CA, Sept. 3-7, 2001.*

30. A. M. Abdullah, H. W. Pickering, and B. A. Shaw, Poster presentation at the Gordon Research Conference (Aqueous Corrosion), *Crevice Corrosion of Al 6xxx Alloys*, in New London, NH (July-2000).*

31. A. M. Abdullah, B. A. Shaw and H. W. Pickering, *Crevice Corrosion of Al 6xxx Alloys*, in *Electrochemical Soc. Meeting*, R. Buchheit and B. A. Shaw, Editors, 2000-23, 401, Electrochemical Society Inc., Pennington, NJ (2000).*

32. Ahmed Galal, Nada F. Atta, S. A. Darwish and Abubakr M. A. Ismail, *Conducting Polymer Ferrocene-Modified Electrochemical Sensor for the Determination of Organic and Biological Compounds,* at the Pittsburgh Conference Pittcon' 96, McCormick Place, Chicago Il, (March 3-8, 1996).*

TO BE PUBLISHED

33. Ayman M. Zaky, Takeyoshi Okajima, Aboubakr M. Abdullah, Fusao Kitamura and Takeo Ohsaka, Phase Transformations and Electrochemical Behavior Changes with Anodization of Ta/TaOx Electrodes, Submitted to Electrochimica Acta.

34. A. M. Abdullah, H. W. Pickering and B. A. Shaw, *Immediate Crevice*

Corrosion of Al 6113-Like Alloy, To be Published.*

35. A. M. Abdullah, H. W. Pickering and B. A. Shaw, *Delayed Crevice Corrosion of Al 6113-Like Alloy*, To be Published.*

36. A. M. Abdullah, E. Sikora, H. W. Pickering, B. A. Shaw, *Intergranular Corrosion of an Al 6113-Like Alloy*, To be Published.*

Research Proposals Submitted

1. Sensors based on Nanostructured Hybrid Materials. Submitted on Sept. 10, 2010 for STDF/JSPS.

2. A Novel Pilot-Scale Application for Bio-hydrogen Fermentation of Starch Wastewater Industry and Synthesize of New Materials for Chemical Storage of Hydrogen. Submitted on October 30, 2010 for STDF/US.

3. Designing, Manufacturing and Developing Prototype Distillation Systems. Submitted on December 15, 2010 for STDF National Cal.

4. Sustainable Technologies for Domestic Wastewater Treatment for Reuse in Agricultural Purposes. Submitted December 2010 for STDF/Morocco.

Professional memberships

1. Currently a member in The Electrochemical Society (ECS).

2. Student membership in American Society of Metals (ASM) from 2002-2004

3. Student membership in the National Association of Corrosion Engineers (NACE) from 1999-2003

Languages

Fluent in Arabic and English. I Know a Little German, French and Japanese.

References

1. Prof. Takeo Ohsaka, Electronic Chemistry Department, Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology, 4259, G1-5, Nagatsuta, Midori – Ku, Yokohama, 226-8502, Japan, Tel: ++81-45-924-5404, Fax: ++81-45-924-5489, Email: ohsaka@echem.titech.ac.jp

2. Prof. Ahmad Galal, Cairo University, Dean of the Faculty of Science, Cairo University, Giza, Egypt, Tel: ++20-12-2329453 Email: galalah1@yahoo.com

3. Prof. Viola I. Birss, Chemistry Department, University of Calgary, 2500 University Dr NW, Calgary, AB T2N 1N4 Tel: ++1-403-220-6432, Email: birss@ucalgary.ca

---

Hobbies

Reading, surfing the web, swimming, volunteer activities, computer maintenance and upgrade.

Awards, Scholarships and Fellowships

1. Honorable position and a $100 award from the Chemistry Department at Cairo University for being one of the best seven students out of the 400 major chemistry students in Cairo University (1993).
2. Ph.D. scholarship form The Pennsylvania State University (1998).
3. Runner-up poster ($75 Award) in the Materials Science and Engineering Department (Metals Section) in The COOP meeting (Cooperative Program between Mat. Sci. and Eng. Dept. and Industry) at Penn State University (2000).
4. Post doctoral fellowship from Tokyo Institute of Technology, Japan (2006).
5. Post doctoral fellowship from The University of Calgary (2009).
