

Mohammad K. Hassan

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WORK EXPERIENCE

- Center for Advanced Materials, Qatar University, Doha, Qatar** Oct 2014 – Current
Research Fellow
- School of Polymers & High Performance Materials, The University of Southern Mississippi (USM), Hattiesburg, Mississippi** May 2014 – Sept. 2014
Research Lab Leader/Group Manager
- School of Polymers & High Performance Materials, The University of Southern Mississippi (USM), Hattiesburg, Mississippi** Nov 2009 – April 2014
Senior Research Scientist
- School of Polymers & High Performance Materials, The University of Southern Mississippi (USM), Hattiesburg, Mississippi** Jul 2004 - Jul 2009
Postdoctoral Research Fellow

- Research Interests & experiences:

- * Polymer electrolyte membranes for high temperature fuel cell applications, including both hydrogen and methanol based fuel cells for automotive, stationary and portable systems.
- * Marine degradable plastics for packaging applications.
- * Polymer composites and resins for coating and aerospace applications.
- * Supercapacitor materials for energy storage media.

Achievements:

- Helped to develop a comprehensive vertically-integrated fuel cell membrane program at USM through support from the Department of Energy (DOE).
- Extensive experiences in characterization of polymer electrolyte membranes for high temperature fuel cell applications, marine degradable plastics, Polymer composites and resins, and supercapacitor materials for energy storage media. Characterization involved the usage of Broadband dielectric spectroscopy in studying polymer chain dynamics and proton hopping mechanisms related to changes in chemical structure, temperature and chemical degradation.
- Successfully developed a method to connect changes in polymer molecular weight distribution with chemical degradation in NafionTM membranes, which is important in understanding performance loss and durability during fuel cell operation, using dielectric spectroscopy.
- Successfully discovered and characterized new low cost hydrocarbon fuel cell membranes based on blending and copolymerizing poly(ethylene glycol) (PEG) into fuel cell membranes, which caused proton conductivities to increase by a factor of 10, compared to benchmark Nafion membranes and exceeded the US Department of Energy milestone. This work was collaboration between the USM and Prof. Jimmy Mays at the University of Tennessee.
- Successfully developed and characterized new type of marine degradable thermoplastic polyurethanes (TPUs) for packaging applications.
- Extensive experience in studying polymer electrolyte membranes structure-property relationship. Experiences include constructing performance curves for membranes using actual fuel cell testing stations, in-situ membrane degradation through open circuit voltage (OCV) tests as well as ex-situ chemical degradation using Fenton reagent, and mechanical durability testing of membranes.

- Extensive experience in inorganic modifications of polymer electrolyte membranes and characterization of their performance/degradation using Fuel Cell Testing Stations, Proton Conductivity, Broadband Dielectric Spectroscopy, ATR-FTIR and Solid State NMR Spectroscopy.
- Extensive experience in preparation and studying mechanical properties & degradation mechanisms in biodegradable polylactides and TPUs.
- Extensive experience in studying epoxy polymer composite resins curing via dielectric spectroscopy and the new technology of inter-digitated electrode sensors developed by Netzsch, Inc.
- Participated in teaching polymer characterization lab to undergraduates and have been directly overseeing portions of many graduate students research dissertations.

University of Cincinnati, Cincinnati, United States

Sep 2000 - Jun 2004

Research/Teaching Assistant

Achievements:

- Successfully prepared and characterized new type of elastomeric materials based on poly(tetrahydrofuran)(PTHF).
- Improved the mechanical properties of P&G's biodegradable poly(3-hydroxybutyrate-co-3 hydroxyhexanoate) (Nodax™) by pre-orientation and crosslinking techniques.
- Diversified utilization of sound wave propagation technique to characterize elastomeric polymer networks.
- Shared in cross-functional group which successfully measured Segmental orientation and strain-induced crystallization in poly(tetrahydrofuran) PTHF networks using Wide- and Small-angle X-ray Scattering, Small-angle Neutron Scattering techniques.
- Extensive experience in polymers synthesis, elastomers and polymer nanocomposites preparation.
- Experienced with biodegradable polymers and their nanocomposites characterization using various techniques such as: GPC, ATR-FTIR Spectroscopy, Wide- and Small angle X-ray Scattering, Small-angle Neutron Scattering, Instron Mechanical Tester, SEM, DMA, DSC, TGA, and TEM.
- Teaching responsibilities included delivery of general/freshmen chemistry lab instruction, supervision of lab students and grading of students lab reports.
- Shared in preparation of chemistry experiments demonstrations used in freshman lectures.
- Tutored general/freshmen chemistry classes for pre-medical and engineering majors' students.

Cairo University at Beni Suef, Beni Suef, Egypt

Sep 1994 - Aug 1999

Research/Teaching Assistant

Achievements:

- Successfully prepared poly(methylmethacrylate) (PMMA) networks and characterized their mechanical properties using equilibrium stress-strain and swelling techniques.
- Measured the molecular orientation and the orientation relaxation of the deformed poly(methylmethacrylate) networks chains by Fourier-transformation infrared (FTIR) spectroscopy.
- Teaching responsibilities included delivery of general/freshmen, advanced physical and analytical chemistry lab instruction, supervision of lab students and grading of students lab reports.
- Managed 15-20 general/freshmen chemistry lab teaching assistants.
- Scheduled lab usage and compiled grades for over 500 students.
- Authored experimental procedures and quizzes for undergraduate chemistry major students.
- Lead chemistry tutoring program that included over 200 students.

Education

Ph. D.	University of Cincinnati	Chemistry/Polymer Science	September 2004
M. Sc.	Cairo University	Chemistry/Polymer Science	January 2001
B. Sc.	Cairo University	Chemistry	June 1994

Honors and Skills

- University of Southern Mississippi, Postdoctoral Fellowship/Visiting Research Scientist, July 2004–Current
- Fuel Cell Short Course, Florida Solar Energy Center, Cocoa, Florida, February 1-5, 2009
- University of Cincinnati Research Council Summer Graduate Summer Fellowship, June 2003–Sep. 2003
- University of Cincinnati, Chemistry Department, Research/Teaching Assistantship, Sep. 2000–June 2004
- University of Cincinnati, Chemistry Department, Visiting Researcher, Sep. 1999–June 2000
- Cairo University, Chemistry Department, Research/Teaching Assistantship, July 1995–Sep. 1999
- Ranked first in a class of 12 students, Department of Chemistry, Cairo University, 1994.
- Member of the American Chemical Society
- Skilled in Kaleida Graph, Sigma Plot, Chem Draw, ISIS Draw, and Microsoft Office
- Fully bilingual in Arabic and English

Research Proposals:

1. Title: Development of New Generation Electroless Ni-Based Nano-Composite Coating for Oil and Gas Pipelines.
Investigators: Qatar University, Center for Advanced Materials; Dalhousie University, Canada.
Role: Lead PI
Funding Agency: Qatar National Research Fund – NPRP Program
Period: 2016-2019
Requested fund: \$798,034
Status: Awarded
2. Title: Design, synthesis and evaluation of low cost and highly activity fuel-cell catalysts for direct methanol fuel cells.
Investigators: Qatar University, Center for Advanced Materials; University of South Carolina, United States.
Role: PI
Funding Agency: Qatar National Research Fund – NPRP Program
Period: 2016-2019
Requested fund: \$862,944
Status: Awarded
3. Title: Optimizing glassy polymer network morphology for enhanced nano-particle dispersion, stabilization and performance.
Investigators: The University of Southern Mississippi, Department of Polymer science and Engineering; Boeing Research and Technology; Cytec Engineered Materials.
Role: Co-PI
Funding Agency: United States Air Force Office of Scientific Research (AFOSR) and the Boeing Research and Technology
Period: 2013-2016
Requested fund: \$300,000
Status: Awarded

Publications: (total citations of 522 and *h*- index of 11 according to Google scholar)

Journals

1. Universal Power Law Behavior of the AC Conductivity vs. Frequency of Agglomerate Morphologies in Conductive Carbon Nanotube Reinforced Epoxy Networks. Brian M. Greenhoe, **Mohammad K. Hassan**, Jeffrey S. Wiggins, and Kenneth A. Mauritz, *Journal of Polymer Science, Part B: Polymer Physics*, **Accepted**.
2. Molecular Scale Cure Rate Dependence of Thermoset Matrix Polymers. Christopher H. Childers, **Mohammad K. Hassan**, Kenneth A. Mauritz, and Jeffrey S. Wiggins, *Arabian Journal of Chemistry* **2016**, *9*, 206–218.
3. Polymer chain dynamics in epoxy based composites as investigated by broadband dielectric spectroscopy. **Mohammad K. Hassan**, Samuel J. Tucker, Ahmed Abukmail, Jeffrey S. Wiggins, and Kenneth A. Mauritz, *Arabian Journal of Chemistry* **2016**, *9*, 305-315.
4. Investigation of the physico-mechanical properties of electrospun PVDF/cellulose (nano)fibers. Ahmed A. Issa, Mariam Al-Maadeed, Adriaan S. Luyt, Miroslav Mrlik, and **Mohammad K. Hassan**, *Journal of Applied Polymer Science* **2016**, *133*, 43594.
5. Secondary chain motion and mechanical properties of γ -irradiated-regenerated cellulose films. Aisha Tanvir, Mariam A. Al-Maadeed, and **Mohammad K. Hassan**, *Starch/Stärke* **2016**, *68*, 1–8.
6. Preparation and Preliminary Dielectric Characterization of Structured C₆₀-Thiol-Ene Polymer Nanocomposites Assembled Using the Thiol-Ene Click Reaction. Hanaa M. Ahmed, Amber D. Windham, Maryam M. Al-Ejji, Noora H. Al-Qahtani, **Mohammad K. Hassan**, Kenneth A. Mauritz, Randy K. Buchanan and J. Paige Buchanan, *Materials* **2015**, *8*, 7795–7804.
7. High temperature proton exchange membranes with enhanced proton conductivities at low humidity and high temperature based on polymer blends and block copolymers of poly(1,3-cyclohexadiene) and poly(ethylene glycol). Shawn Deng, **Mohammad K. Hassan**, Amol Nalawade, Kelly A. Perry, Karren L. More, Kenneth A. Mauritz, Marshall T. McDonnell, David J. Keffer, and Jimmy W. Mays, *Polymer* **2015**, *77*, 208–217.
8. Hydrocarbon-based fuel cell membranes: Sulfonated crosslinked poly(1,3-cyclohexadiene) membranes for high temperature polymer electrolyte fuel cells. Shawn Deng, **Mohammad K. Hassan**, Kenneth A. Mauritz, and Jimmy W. Mays, *Polymer* **2015**, *73*, 17-27.
9. Dielectric Properties of C₆₀ and Sc₃N@C₈₀ Fullerenol Containing Polyurethane Nanocomposites. Hanaa M. Ahmed, **Mohammad K. Hassan**, Kenneth A. Mauritz, Steven L. Bunkley, Randy K. Buchanan, and J. Paige Buchanan, *Journal of Applied Polymer Science* **2014**, *131*, 40577–40588.
10. Di(cyanate Ester) Networks Based on Alternative Fluorinated Bisphenols with Extremely Low Water Uptake. Cynthia A. Corley, Andrew J. Guenther, Christopher M. Sahagun, Kevin R. Lamison, Josiah T. Reams, **Mohammad K. Hassan**, Sarah E. Morgan, Scott T. Iacono, and Joseph M. Mabry, *ACS Macro Letters* **2014**, *3* (1), 105–109.
11. Broadband dielectric spectroscopic studies of molecular motions in a Nafion® membrane vs. annealing time and temperature. **Mohammad K. Hassan**, Ahmed Abukmail, and Kenneth A. Mauritz, *European Polymer Journal* **2012**, *48*, 789–802.
12. Broadband Dielectric Spectroscopy Studies of Glassy State Relaxations in Annealed Poly (2,5-benzimidazole). Amol Nalawade, **Mohammad K. Hassan**, William L. Jarrett, Kenneth A. Mauritz, and Morton H. Litt, *Polymer International* **2012**; *61*(1), 55–64.
13. Macromolecular Dynamics of Sulfonated Poly(styrene-*b*-ethylene-ran-butylene-*b*-styrene) Block Copolymers by Broadband Dielectric Spectroscopy. Hongying Chen, **Mohammad K. Hassan**, Sateesh K. Peddini, and Kenneth A. Mauritz, *European Polymer Journal* **2011**, *47*, 1936–1948.
14. Sub-Tg Macromolecular Motions in Phosphoric Acid Doped Polybenzimidazole Membranes for High Temperature Fuel Cell Applications. Amol Nalawade, Ahmed Abukmail, **Mohammad K. Hassan**, and Kenneth A. Mauritz. *ECS Transactions* **2011**, *41* (1), 1449-1459.

15. Analysis of Nafion® Fuel Cell Membrane Chemical Durability Using Broadband Dielectric Spectroscopy. **Mohammad K. Hassan**, Amol Nalawade, Ahmed Abukmail, Yatin Patil, and Kenneth A. Mauritz. *ECS Transactions* **2011**, 41 (1), 1359-1370.
16. Seawater degradable thermoplastic polyurethanes. Scott J. Moravek, **Mohammad K. Hassan**, David J. Drake, Tim R. Cooper, Jeffrey S. Wiggins, Kenneth A. Mauritz, and Robson F. Storey, *Journal of Applied Polymer Science* **2010**, 115(3), 1873-1880.
17. Broadband Dielectric Spectroscopic Studies of Annealed Nafion Membranes. **Mohammad K. Hassan** and Kenneth A. Mauritz, *Electrochemical Society Transactions* **2009**, 25, 371.
18. Nanophase Separated Perfluorinated Ionomers as Sol-Gel Polymerization Templates for Functional Inorganic Oxide Nanoparticles. Kenneth A. Mauritz and **Mohammad K. Hassan**, *Polymer Reviews* **2007**, 47, 543.
19. Broadband Dielectric Spectroscopic Characterization of Nafion Chemical Degradation. David W. Rhoades, **Mohammad K. Hassan**, Shawn J. Osborn, Robert B. Moore, and Kenneth A. Mauritz, *Journal of Power Sources* **2007**, 172, 72.
20. Some Novel Layered-silicate Nanocomposites Based on a Biodegradable Hydroxybutyrate Copolymer. Xiujuan Zhang, Gui Lin, Reda Abou-Hussein, **Mohammad K. Hassan**, Isao Noda, and James E. Mark, *European Polymer Journal* **2007**, 43, 3128.
21. Glass Transition Temperature of Perfluorosulfonic Acid Ionomers. Shawn J. Osborn, **Mohammad K. Hassan**, Gilles M. Divoux; David W. Rhoades, Kenneth A. Mauritz, and Robert B. Moore, *Macromolecules* **2007**, 40, 3886.
22. Broadband Dielectric Spectroscopic Characterization of the Hydrolytic Degradation of Carboxylic Acid-terminated Poly(D,L-lactide) Materials. **Mohammad K. Hassan**, Jeffery S. Wiggins, Robson F. Storey, and Kenneth A. Mauritz, *Polymer* **2007**, 48, 2022.
23. Hydrolytic Degradation of Poly(D,L-lactide) as a Function of End Group: Carboxylic Acid vs. Hydroxyl. Jeffrey S. Wiggins, **Mohammad K. Hassan**, Kenneth A. Mauritz, and Robson F. Storey, *Polymer* **2006**, 47, 1960.
24. Biodegradable copolymers of 3-hydroxybutyrate-co-3-hydroxyhexanoate (nodax™), including recent improvements in their mechanical properties. **Mohammad K. Hassan**, Reda Abou-Hussein, Xiujuan Zhang, James E. Mark, and Isao Noda, *Molecular Crystals and Liquid Crystals* **2006**, 447, 23/[341] - 44/[362].
25. Biodegradable Aliphatic Thermoplastic Polyurethane based on Poly(ε-caprolactone) and L-lysine Diisocyanate. **Mohammad K. Hassan**, Kenneth A. Mauritz, Robson F. Storey, and Jeffrey S. Wiggins, *Journal of Polymer Science, Part A: Polymer Chemistry* **2006**, 44, 2990.
26. An investigation of the properties of poly(dimethylsiloxane)-bioinspired silica hybrids Siddharth V. Patwardhan, Vijay P. Taori, **Mohamed Hassan**, Nikhil R. Agashe, Jeffrey E. Franklin, Gregory Beaucage, James E. Mark, and Stephen J. Clarson, *European Polymer Journal* **2006**, 42, 167–178.
27. Sol-Gel Condensations to Form Polytetrahydrofuran Networks and Their Elastomeric Behavior. **M. K. Hassan**, G. G. Abdel-Sadek, G. Beaucage, J. E. Mark, and M. A. Sharaf, *Journal of Macromolecular Science: Part A-Pure and Applied Chemistry* **2004**, A41(1), 1-13.
28. Improvement in the Mechanical Properties of Poly(3-hydroxybutyrate-co-3-hydroxyhexanoate) (Nodax™) by Pre-Orientation. **Mohamed K. Hassan**, Samir A. Abdel-Latif, Omar M. El-Roudi, Mohamed A. Sharaf, Isao Noda, and James E. Mark, *Journal of Applied Polymer Science* **2004**, 94, 2257.

Book Chapters

1. Proton Exchange Membranes for H₂ Fuel Cells Applications. Kenneth A. Mauritz, Amol Nalawade and **Mohammad K. Hassan**, in Sol-Gel Processing for Conventional and Alternative Energy, Aparicio, M.; Jitianu, A.; Klein, L. C.; Editors; Springer: New York; **2012**; Chapter 5: pp 73-98.

- Broadband dielectric spectroscopic studies of nafion/silicate membranes. **Mohammad K. Hassan** and Kenneth A. Mauritz, in American Chemical Society Symposium Book Series, Volume 1040: Fuel Cell Chemistry and Operation, Herring, A. M.; Zawodzinski Jr., T. A.; Hamrock, S. J.; Editors; ACS Publications: Washington, DC; **2010**; Chapter 8: pp 113-124.
- High-oxygen barrier materials based on hyperbranched aliphatic polyesters. Jason D. Pratt, Brian G. Olson, Justin P. Brandt, **Mohammad K. Hassan**, Jo Ann Ratto, Jeffrey S. Wiggins, James W. Rawlins, and Sergei Nazarenko, in American Chemical Society Symposium Book Series, Volume 1004: Polymer Degradation and Performance, Celina, M. C.; Wiggins, J. S.; Billingham; N. C.; Editors; ACS publications: Washington, DC; **2009**; Chapter 2: pp 17-30.
- Broadband Dielectric Spectroscopic Characterization of the Hydrolytic Degradation of Hydroxyl-terminated Poly(D,L-Lactide) Materials. **Mohammad K. Hassan**, Jeffrey S. Wiggins, Robson F. Storey, and Kenneth A. Mauritz, in American Chemical Society Symposium Book Series, Volume 977: Polymers for Biomedical Applications, Mahapatro, A.; Kulshrestha, A. S.; Editors; ACS publications: Washington, DC; **2008**; Chapter 9: pp 153-169.
- Nylon 11. George Apgar and **Mohammad K. Hassan**, in Polymer Data Handbook, Second Edition, James E. Mark, Editor, Oxford University Press: New York, **2009**.

Patents

- Polyelectrolytes Comprising Sulfonated Polydienes and Poly(alkylene oxides) and Related Methods. Jimmy W. Mays, Suxiang Deng, Kenneth A. Mauritz, **Mohammad K. Hassan**, and Samuel P. Gido, U.S. Patents, US 2009/0306295 A1, **2009**.

Conferences Preprints (Non-refereed Publications)

- Analysis of Cure Ramp Rate Dependence of Polymer Chain Relaxations and Interfacial Polarization in Epoxy-Based Composites as Investigated by Broadband Dielectric Spectroscopy”, Mohammad K. Hassan, Christopher Childers, Jessica Piness, Kenneth A. Mauritz, and Jeffrey S. Wiggins, Proceedings of the Society for the Advancement of Material and Process Engineering (SAMPE), **2014**.
- Macromolecular and Proton Motions in Fuel Cell Membranes via Dielectric Spectroscopy. Mohammad K. Hassan, Amol Nalawade, and Kenneth A. Mauritz, Preprints of the American Chemical Society Symposia, Division of Fuel Chemistry **2011**, 56(2), 220-221.
- Real Time Dielectric Spectroscopic Monitor of Curing of Epoxy Networks with Pendant Bulky Groups. Mohammad K. Hassan, Katherine L. Frank, Ahmed Abukmail, Jeffrey S. Wiggins, and Kenneth A. Mauritz, Polymer Preprints **2011**, 52(2), 53-54.
- Real Time Dielectric Spectroscopic Monitor of Curing Epoxy-Based Composite Resins Produced by Vacuum-Assisted Resin Transfer Molding. Mohammad K. Hassan, Jianwei Tu, Ahmed Abukmail, Jeffrey S. Wiggins, and Kenneth A. Mauritz, Polymer Preprints **2011**, 52(2), 51-52.
- Sub-Tg Relaxations in Epoxy-Based Composites as Investigated by Broadband Dielectric Spectroscopy. Mohammad K. Hassan, Samuel J. Tucker, Katherine L. Frank, Jeffrey S. Wiggins and Kenneth A. Mauritz, Polymer Preprints **2011**, 52(2), 83-84.
- Analysis of Macromolecular and Proton Motions in Fuel Cell Membranes using Dielectric Spectroscopy. Mohammad K. Hassan, Amol Nalawade, and Kenneth A. Mauritz, Polymer Preprints **2011**, 52(1), xx.
- Physical and Dielectric Properties of Fullerene-containing Polyurethane. Hanaa M. Ahmed, Steve Stevenson, Mohammad K. Hassan, Kenneth A. Mauritz, and J. Paige Phillips, Polymeric Materials: Science & Engineering **2011**, xx, xx.
- Broadband Dielectric Spectroscopy Studies of Instrument - in situ Annealed Poly (2,5-benzimidazole) Membrane Materials. Amol Nalawade, Mohammad K. Hassan, Kenneth A.

- Mauritz, and Morton H. Litt, Preprints of the American Chemical Society Symposia, Division of Fuel Chemistry **2010**, 55(2), 243-244.
9. Low Cost High Temperature Fuel Cell Membranes Based on Poly(1,3-cyclohexadiene) Homopolymers, Polymer blends, and Block Copolymers. Suxiang Deng, Mohammad K. Hassan, Kenneth A. Mauritz, and Jimmy W. Mays, Preprints of the American Chemical Society Symposia, Division of Fuel Chemistry **2009**, 54(2), 433-434.
 10. Dielectric spectroscopic studies of Nafion and Nafion/silicate membranes. Kenneth A. Mauritz, Mohammad K. Hassan, Yatin Patil, and David W. Rhoades, Preprints of the American Chemical Society Symposia, Division of Fuel Chemistry **2008**, 53(2), 648-649.
 11. Broadband Dielectric Spectroscopic Studies of Nafion® Silicate Nanocomposite Membranes. Mohammad K. Hassan and Kenneth A. Mauritz, Polymeric Materials: Science & Engineering **2008**, 98, 891.
 12. Nafion® Silicate Hybrid Membranes Via Dibutyltin Dilaurate-Catalyzed in Situ Sol-Gel Processes. Mohammad K. Hassan and Kenneth A. Mauritz, Polymeric Materials: Science & Engineering **2008**, 98, 740.
 13. Molecular dynamics of sulfonated poly(styrene-*b*-ethylene/butylene-*b*-styrene) block copolymers. Hongying Chen, Mohammad K. Hassan, and Kenneth A. Mauritz, Polymeric Materials: Science & Engineering **2008**, 98, 881.
 14. Chain Dynamics of Nafion® Films Neutralized with Tetrabutyl Ammonium Counterions as Investigated by Broadband Dielectric Spectroscopy. Mohammad K. Hassan, David W. Rhoades, Shawn J. Osborn, Robert B. Moore, and Kenneth A. Mauritz, Preprints of the American Chemical Society Symposia, Division of Fuel Chemistry **2008**, 53(1), 533-535.
 15. Poly 1,3-Cyclohexadiene Based Proton Exchange Fuel Cell Membranes. Suxiang Deng, Mohammad K. Hassan, Jimmy W. Mays, and Kenneth A. Mauritz, Abstracts of the 59th Southeast Regional Meeting of the American Chemical Society, Greenville, SC, United States, October 24-27, **2007**.
 16. Synthesis of Poly(D,L-lactide) Functionalized with Pendant Carboxylic Acid Groups. Tim R Cooper, Mohammad K. Hassan, Kenneth A. Mauritz, and Robson F. Storey, Polymer Preprints **2007**, 48, 635.
 17. Marine-degradable thermoplastic polyurethanes. Scott J. Moravek, Tim R Cooper, Hassan, Mohammad K. Hassan, Jeffery S. Wiggins, Kenneth A. Mauritz, and Robson F. Storey, Polymer Preprints **2007**, 48, 597.
 18. Degradable Thermoplastic Polyurethanes Based on 4,4'-Dicyclohexylmethane Diisocyanate. Scott J. Moravek, Tim R Cooper, Mohammad K. Hassan, Jeffery S. Wiggins, Kenneth A. Mauritz, and Robson F. Storey, Polymer Preprints **2007**, 48, 568.
 19. Biodegradable, High Oxygen Barrier Films Based on Polyhydroxylated Dendritic Polymers Cross-linked with 1,6-Hexamethylene Diisocyanate. Jason Pratt, Brian G. Olson, Mohammad K. Hassan, William L. Jarrett, Jeffery S. Wiggins, James W. Rawlins, and Sergei Nazarenko, Polymer Preprints **2007**, 48, 556.
 20. Preparation of Organoclay Nanocomposites from Biodegradable Poly(3-hydroxybutyrate-co-3-hydroxyhexanoate) (Nodax). Xiujuan Zhang, Reda Abou-Hussein, Mohammad K. Hassan, Isao Noda, and James E. Mark, Polymer Preprints **2007**, 48, 489.
 21. Broadband Dielectric Spectroscopy Characterization of Chemical Degradation in Nafion®/Silicate Nanocomposite Membranes. Mohammad K. Hassan, Robert B. Moore and Kenneth A. Mauritz, AIChE Spring Meeting **2007**, Houston.
 22. Broadband Dielectric Spectroscopy Studies of Nafion® Degradation. Mohammad K. Hassan, David W. Rhoades, Shawn J. Osborn, Robert B. Moore, and Kenneth A. Mauritz, Preprints of the American Chemical Society Symposia, Division of Fuel Chemistry **2006**, 51, 686.
 23. Novel Method for Characterization of Poly(D,L-lactide) Degradation Based on Dielectric Spectroscopy. Mohammad K. Hassan, Jeffrey S. Wiggins, Robson F. Storey, and Kenneth A. Mauritz, Polymeric Materials: Science & Engineering **2006**, 95, 900.

24. L-Lysine Diisocyanate Based Biodegradable Thermoplastic Polyurethanes with Broad Range of Mechanical Properties. Mohammad K. Hassan, Jeffrey S. Wiggins, Kenneth A. Mauritz, and Robson F. Storey, *Polymeric Materials: Science & Engineering* **2006**, 95, 656.
25. Broadband Dielectric Spectroscopy of mPP/PC Blend Prepared Via In Situ Polymerization and Compatibilization. Samy A. Madbouly, Joshua U. Otaigbe, Mohammad K. Hassan, and Kenneth A. Mauritz, *Polymeric Materials: Science & Engineering* **2006**, 94, 831.
26. Improvement in the Mechanical Properties of Poly(3-hydroxybutyrate-co-3-hydroxyhexanoate) (Nodax™) by Pre-Orientation. Mohamed K. Hassan, Samir A. Abdel-Latif, Omar M. El-Roudi, Mohamed A. Sharaf, Isao Noda, and James E. Mark, *Polymeric Materials: Science & Engineering* **2004**, 90, 771.
27. Mechanical Properties of Crosslinked Poly(3-hydroxybutyrate-co-3-hydroxyhexanoate) (Nodax™) Films. Mohamed K. Hassan, Omar M. El-Roudi, Samir A. Abdel-Latif, Mohamed A. Sharaf, Isao Noda, and James E. Mark, *Polymeric Materials: Science & Engineering* **2004**, 90, 459.
28. Reinforcement of Poly(dimethylsiloxane) Elastomers using Bioinspired Silica. Vijay P. Taori, Mohamed K. Hassan, Siddharth V. Patwardhan, James E. Mark, and Stephen J. Clarson, *Polymer Preprints* **2004**, 45(1), 694.
29. Thermoplastic Elastomeric Polypropylene Reinforced with Clay, Other Layered Silicates, or Fumed Silica. Reda Abu-Hussein, Guru S. Rajan, Yen T. Vu, Mohamed K. Hassan, James E. Mark, Tety Kwee, Kenneth A. Mauritz, and Charles Myers, *Polymer Preprints* **2004**, 45(1), 870.
30. Elastic Properties of Poly(methyl methacrylate) Networks. Mohamed A. Sharaf and Mohamed K. Hassan, *Polymeric Materials: Science & Engineering* **2003**, 89, 584.
31. Molecular Orientation of Deformed Poly(methyl methacrylate) Networks. Comparisons with Theories; Mohamed A. Sharaf and Mohamed K. Hassan, *Polymeric Materials: Science & Engineering* **2003**, 89, 430.
32. Orientational Relaxation of Deformed Poly(methyl methacrylate) Networks. Mohamed A. Sharaf and Mohamed K. Hassan, *Polymeric Materials: Science & Engineering* **2003**, 89, 449.
33. Pulse Speed Propagation in Polybutadiene (PBD) Networks. M. K. Hassan and J. E. Mark, *Polymer Preprints* **2002**, 43(1), 268.

Presentations:

Abbreviations: American Chemical Society (ACS), American Institute of Chemical Engineers (AIChE), Society for the Advancement of Material and Process Engineering (SAMPE), Composites and Advanced Materials Expo (CAMX), American Composites Manufacturers Association (ACMA).

1. “Dielectric spectroscopic analysis of cure behavior and relaxation processes in polymer composites”, **Mohammad K. Hassan**, Christopher Childers, Kenneth A. Mauritz, and Jeffrey S. Wiggins, presented at the 249th ACS National Meeting: Polymer Composites and High Performance Materials Symposium, Denver, Colorado, United States, March 22 – 26, **2015**.
Invited Talk
2. “Student research training to the benefit of industry: Case studies”, **Adriaan Stephanus Luyt** and **Mohammad K. Hassan**, Materials Science and Engineering Symposium, Doha, Qatar, March 17, **2015**. **Invited Talk**
3. “Analysis of Cure Ramp Rate Dependence of Polymer Chain Relaxations and Interfacial Polarization in Epoxy-Based Composites as Investigated by Broadband Dielectric Spectroscopy”, **Mohammad K. Hassan**, Christopher Childers, Jessica Piness, Kenneth A. Mauritz, and Jeffrey S.

Wiggins, presented at the joint CAMX/ACMA/SAMPE meeting, Orlando, Florida, United States, October 13-16, 2014. **Talk**

4. "Macromolecular and Proton Motions in Fuel Cell Membranes via Dielectric Spectroscopy", **Mohammad K. Hassan**, Amol Nalawade, and Kenneth A. Mauritz, presented at the 242nd ACS National Meeting: Fuel Cells Chemistry and Operation, Proton Exchange Membranes Symposium, Denver, Colorado, United States, August 28 - September 1, 2011. **Talk**
5. "Real Time Dielectric Spectroscopic Monitor of Curing Epoxy-Based Composite Resins Produced by Vacuum-Assisted Resin Transfer Molding", **Mohammad K. Hassan**, Jianwei Tu, Ahmed Abukmail, Jeffrey S. Wiggins, and Kenneth A. Mauritz, presented at the 242nd ACS National Meeting: Advances in Polymer Composites Symposium, Denver, Colorado, United States, August 28 - September 1, 2011. **Talk**
6. "Sub-Tg Relaxations in Epoxy-Based Composites as Investigated by Broadband Dielectric Spectroscopy", **Mohammad K. Hassan**, Samuel J. Tucker, Katherine L. Frank, Jeffrey S. Wiggins and Kenneth A. Mauritz, , presented at the 242nd ACS National Meeting: Advances in Polymer Composites Symposium, Denver, Colorado, United States, August 28 - September 1, 2011. **Talk**
7. "Real Time Dielectric Spectroscopic Monitor of Curing Kinetics of Composite Resins", **Mohammad K. Hassan** and Kenneth A. Mauritz, presented at the Polymer Composite Matrix Science Workshop-held in conjunction with the Waterborne Symposium/co-sponsored by the University of Southern Mississippi and the Polymer Division of the ACS, New Orleans, Louisiana, United States, February 8-9, 2010. **Poster**
8. "Broadband Dielectric Spectroscopic Studies of Nafion[®]/Silicate Nanocomposite Membranes", **Mohammad K. Hassan** and Kenneth A. Mauritz, presented at the 235th ACS National Meeting: General Papers/New Concepts in Polymeric Materials Symposium, New Orleans, Louisiana, United States, April 6-10, 2008. **Talk**
9. "Nafion[®]/Silicate Hybrid Membranes Via Dibutyltin Dilaurate-Catalyzed in Situ Sol-Gel Processes", **Mohammad K. Hassan** and Kenneth A. Mauritz, presented at the 235th ACS National Meeting: Synthesis and Self-Assembly Approaches to Polymer-Inorganic Hybrid Nanoparticles Symposium, New Orleans, Louisiana, United States, April 6-10, 2008. **Talk**
10. "Chain Dynamics of Nafion[®] Films Neutralized with Tetrabutyl Ammonium Counterions as Investigated by Broadband Dielectric Spectroscopy", **Mohammad K. Hassan**, David W. Rhoades, Shawn J. Osborn, Robert B. Moore, and Kenneth A. Mauritz, presented at the 235th ACS National Meeting: Advances in Fuel Science and Technology Symposium, New Orleans, Louisiana, United States, April 6-10, 2008. **Talk**
11. "Broadband Dielectric Spectroscopy Characterization of Chemical Degradation in Nafion[®]/Silicate Nanocomposite Membranes", **Mohammad K. Hassan**, Robert B. Moore, and Kenneth A. Mauritz, presented at the 2007 AIChE Spring National Meeting: Microstructural Analysis of Proton Exchange Membrane Fuel Cells: Membrane and Catalyst Layer Degradation Mechanisms Symposium, Houston, Texas, United States, April 22-27, 2007. **Talk**
12. "Broadband Dielectric Studies of Nafion[®] Degradation", **Mohammad K. Hassan**, David W. Rhoades, Shawn J. Osborn, Robert B. Moore, and Kenneth A. Mauritz, presented at the 232nd ACS National Meeting: Proton Exchange Membranes for Fuel Cells Symposium in Honor of Prof. James McGrath, San Francisco, California, United States, September 10-14, 2006. **Talk**

13. "Novel Method for Characterization of Poly(D,L-lactide) Degradation Based on Dielectric Spectroscopy", **Mohammad K. Hassan**, Jeffrey S. Wiggins, Robson F. Storey, and Kenneth A. Mauritz, presented at the 232nd ACS National Meeting: Polymers for Biomedical Applications Symposium, San Francisco, California, United States, September 10-14, **2006. Talk**
14. "L-Lysine Diisocyanate Based Biodegradable Thermoplastic Polyurethanes with Broad Range of Mechanical Properties", **Mohammad K. Hassan**, Jeffrey S. Wiggins, Kenneth A. Mauritz, and Robson F. Storey, presented at the 232nd ACS National Meeting: Joint PMSE/POLY Poster Session, San Francisco, California, United States, September 10-14, **2006. Poster**
15. "Improvement in the Mechanical Properties of Poly(3-hydroxybutyrate-co-3-hydroxyhexanoate) (Nodax™) by Pre-Orientation", **Mohamed K. Hassan**, Samir A. Abdel-Latif, Omar M. El-Roudi, Mohamed A. Sharaf, Isao Noda, and James E. Mark, presented at the 227th ACS National Meeting: General Papers/New Concepts in Polymeric Materials Symposium, Anaheim, California, United States, March 28-April 1, **2004. Talk**
16. "Mechanical Properties of Crosslinked Poly(3-hydroxybutyrate-co-3-hydroxyhexanoate) (Nodax™) Films", **Mohamed K. Hassan**, Omar M. El-Roudi, Samir A. Abdel-Latif, Mohamed A. Sharaf, Isao Noda, and James E. Mark, presented at the 227th ACS National Meeting: Joint PMSE/POLY Poster Session, Anaheim, California, United States, March 28-April 1, **2004. Poster**
17. "Pulse Speed Propagation in Polybutadiene (PBD) Networks", **Mohamed K. Hassan** and James E. Mark, presented at the 223rd ACS National Meeting: Chemistry and Engineering of Polyolefins Symposium, Orlando, Florida, United States, April 7-11, **2002. Talk**