Dr. Mehdi Ghaffari

Personal Details

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Associate Professor,

Group of Polymer Engineering, Faculty of Engineering, Golestan University

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Education

Ph.D. in Polymer Engineering:

September 2007– October 2012, Iran Polymer and Petrochemical Institute, Tehran, Iran

Thesis: "Epoxy/Polyaminoamide/Glassflake Nanocomposite Systems: Study the Curing Kinetics, Rheology, Protective performance and Effect of Surface Chemical Treatment of Carbon Steel on the interface

M.Eng. in Chemical Engineering

September 2000 – May 2003, University of Tehran, Tehran, Iran

Thesis: "Mechanical and Thermal Properties of Electron Beam Irradiated Crosslinked Polyethylene Foam"

B.Eng. in Polymer Engineering

September 1996 – September 2000, Amirkabir University of Technology, Tehran, Iran

Thesis: "Semi-Conductive Polymers"

Research Interests

- ► Hydrogels and Drug Delivery Systems
- ► Metal Organic Framework (MOF)
- ► Polymeric Nanocomposites
- ► Organic Coatings
- ► Surface and interface

Work experience

► **Golestan Science and Technology Park,** 07/2019- Now, **President**

► **Golestan University**, 2021 –Now, **Associate Professor**, Member of academic staff of Polymer Engineering Group

► **Golestan University,** 03/2018-07/2019, **Vice President for Research and Technology**

► **Golestan University,**09/2015-03/2018, **Dean of Faculty of Technical and Engineering**

► **Golestan University**, 2012 –2021, **Assistant Professor**, Member of academic staff of Polymer Engineering Group

► **Vrije Universiteit Brussel (VUB)**, 2011, **Researcher**

► **Radin Plast Kavan Co.,** 2015-Now, **Technical Advisor and Head of Research and Development**

► **Ak Profile Co.,** 2021-Now, **Technical Advisor and Head of Research and Development**

► **PIKO Technical Inspection Company,** 2009 – 2019, **Chairman of the Board**

► **Nik Baspar Company**, 2008– 2009, **Quality Control Manager**

Teaching experience

M.Sc.:

► Polymer Characterization

►Novel Applications in Polymers

►Advanced Physical Chemistry of Polymers

►Adhesive and Coatings

B.Sc.:

► Organic Chemistry

► Polymer Chemistry

► Elastomer Engineering

► Physical Chemistry of Polymers

► Physical and Mechanical Properties of Polymers

International Visits

►Research Group Electrochemical and Surface Engineering (Prof. Herman Terryn) and Research Group Physical Chemistry and Polymer Science (Prof. Guy Van Assche), **Vrije Universiteit Brussel**, Brussels, Belgium (October 2010- Agust 2011).

►Research Group Electrochemical and Surface Engineering (Prof. Herman Terryn) **Vrije Universiteit Brussel**, Brussels, Belgium (March 2015- April 2015).

► Research Group Electrochemical and Surface Engineering (Prof. Herman Terryn) **Vrije Universiteit Brussel**, Brussels, Belgium (August 2016- September 2016).

► Research Group Electrochemical and Surface Engineering (Prof. Herman Terryn) **Vrije Universiteit Brussel**, Brussels, Belgium (August 2018- September 2018).

Honors and awards

►Selected as **distinguished quality control manager** by Institute of Standards & Industrial, 2009.

►**PhD Internship Scholarship** award by Iran ministry of science research and technology, 2010.

► Selected as **distinguished researcher** by Golestan university, 2015.

► Selected as **distinguished researcher** by Golestan university, 2017.

► Selected as **distinguished researcher** by Golestan university, 2020.

Technical Skills

►Polymer characterization technics (FTIR, UV, LOI, Tensile, Impact, Vicat-HDT Dielectric Strenght, Volume and Surface Resistivity, Abrasion etc.)

►Thermal characterization (DSC, TGA, MDSC, TAM)

► Surface characterization (XPS, AFM, ATR)

► Microscopic techniques (SEM, EDS)

►Polymer Processing Technique (Single and twin-screw extrusion, Injection molding, calendar, film blowing, blow molding, internal mixer)

► Electrochemical Impedance Spectroscopy (EIS)

Reviewing Tasks

►Corrosion Science

►Applied Surface Science

►Progress in Organic Coatings

►Applied Polymer Science

►Advanced in Polymer Technology

►International Journal of Polymer Science

►Iranian Polymer Journal

Membership:

Member of the Board of the Iranian Polymer Society

Publications (Selected Peered-reviewed Journal Papers)

1. Mobina Bakhshiyani, Mojtaba Jallab, **Mehdi Ghaffari,** "*Development of a high-performance PVA/DOPA bone adhesive incorporated with bioactive glass and hydroxyapatite particles for highly comminuted bone fractures*", **Polymer-Plastics Technology and Materials (IF=2.63)**, DOI:10.1080/25740881.2021.1995419.

2. Ehteshamzadeh, T., Kakaei, S., **Ghaffari, M**, "*Doxorubicin Embedded Polyvinylpyrrolidone-Coated Fe3O4 Nanoparticles for Targeted Drug Delivery System*", **Journal of Superconductivity and Novel Magnetism (IF=1.51),** DOI:10.1007/s10948-021-05952-5 , 2021.

3. Saeid Najafi-Shoa , Mehdi Barikan , Morteza Ehsani ,**Mehdi Ghaffari**, "*Cobalt-Based Ionic Liquid Grafted on Graphene as a Heterogeneous Catalyst for Poly (Ethylene Terephthalate) Glycolysis*", **Polymer Degradation and Stability (IF=5.07),** DOI:10.1016/j.polymdegradstab.2021.109691, 2021.

4. Zakieh Ghamgosar Khorshidi, Mojtaba Jallab, Ehsan Moghbelli, Alireza Goudarzi, **Mehdi Ghaffari,** "*Photocatalytic Analysis of a Hydrophilic Acrylic Coating/Zinc Oxide Nanocomposite on Glass Substrate*", **Polymer-Plastics Technology and Materials (IF=2.63),** 1220-1232, DOI: 10.1080/25740881.2021.1888986, 2021.

5. Mina Arab, Mojtaba Jallab, **Mehdi Ghaffari**, Ehsan Moghbelli, Mohammad Reza Saeb, "*Synthesis, rheological characterization, and antibacterial activity of polyvinyl alcohol (PVA)/zinc oxide nanoparticles wound dressing, achieved under electron beam irradiation*", **Iranian Polymer Journal (IF=1.706)**, DOI:10.1007/s13726-021-00952-7, 2021.

6. Mehrasa Amiri, **Mehdi Ghaffari**, Ali Mirzaee, Ghasem Bahlakeh, Mohammad Reza Saeb, "*Development and anti-corrosion performance of hyperbranched polyglycerol-decorated Fe3O4@SiO2 on mild steel in 1.0 M HCl*", **Journal of Molecular Liquids (IF=5.06)**,314, 2020, 113597.

7. Arezoo Avid, Seyed Hassan Jafari, Hossein Ali Khonakdar, **Mehdi Ghaffari**, Beate Krause, Petra Pötschke, "*Surface modification of MWCNT and its influence on properties of paraffin/MWCNT nanocomposites as phase change material*" **Journal of Applied Polymer Science (IF=3.125)** 137(48428), 5,3,2020.

8. Samaneh Pourbashir, Mohsen Shahrousvand, **Mehdi Ghaffari,** "*Preparation and characterization of semi-IPNs of polycaprolactone/poly (acrylic acid)/cellulosic nanowhisker as artificial articular cartilage*" **International journal of biological macromolecules (IF=6.95)** 142(298-310), 1,1,2020.

9. Maryam Jouyandeh, Negar Rahmati, Elnaz Movahedifar, Behzad Shirkavand Hadavand, Zohre Karami, **Mehdi Ghaffari,** Peyman Taheri, Ehsan Bakhshandeh, Henri Vahabi, Mohammad Reza Ganjali, Krzysztof Formela, Mohammad Reza Saeb, "*Properties of nano-Fe3O4 incorporated epoxy coatings from Cure Index perspective*" **Progress in Organic Coatings (IF=4.469)** 133(220-228),2019.

10. Pooneh Haghdadeh, **Mehdi Ghaffari,** Bahram Ramezanzadeh, Ghasem Bahlakeh, Mohammad Reza Saeb, "*Polyurethane coatings reinforced with 3-(triethoxysilyl) propyl isocyanate functionalized graphene oxide nanosheets: Mechanical and anti-corrosion properties*" **Progress in Organic Coatings (IF=4.469)** 136 (105243), 1,11,2019.

11. Ehsan Javadi, **Mehdi Ghaffari,** Ghasem Bahlakeh, Peyman Taheri, "*Photocatalytic, corrosion protection and adhesion properties of acrylic nanocomposite coating containing silane treated nano zinc oxide: A combined experimental and simulation study*" **Progress in Organic Coatings (IF=4.469)** 135(496-509), 1,10,2019.

12. Mohammad M Noori, Hossein Ali Khonakdar, Hamed Azizi, **Mehdi Ghaffari,** Mohammad Arjmand, Seyed H Jafari, "*Paraffin/CuO nanocomposites as phase change materials: Effect of surface modification of CuO*" **Polymer Composites (IF=2.265)** 2019.

13. Maryam Jouyandeh, Payam Zarrintaj, Mohammad Reza Ganjali, Jagar A Ali, Isa Karimzadeh, Mustafa Aghazadeh, **Mehdi Ghaffari,** Mohammad Reza Saeb, "*Curing epoxy with electrochemically synthesized GdxFe3-xO4 magnetic nanoparticles*" **Progress in Organic Coatings (IF=4.469)** 136(105245), 1,11,2019.

14. Saeed GilakHakimabadi, Morteza Ehsani, Hossein Ali Khonakdar, **Mehdi Ghaffari,** Seyed Hassan Jafari, "*Controlled-release of ferulic acid from active packaging based on LDPE/EVA blend: Experimental and modeling*" **Food Packaging and Shelf Life (IF=4.244)** 22(100392), 1,12,2019.

15. Pooneh Haghdadeh, **Mehdi Ghaffari,** Bahram Ramezanzadeh, Ghasem Bahlakeh, Mohammad Reza Saeb, "*The role of functionalized graphene oxide on the mechanical and anti-corrosion properties of polyurethane coating*" **Journal of the Taiwan Institute of Chemical Engineers (IF=4.069)** 86(199-212) 1,5,2018.

16. Maryam Halvaee, Khadijeh Didehban, Vahabodin Goodarzi, **Mehdi Ghaffari,** Morteza Ehsani, Mohammad Reza Saeb, "*Comparison of pristine and polyaniline-grafted MWCNT s as conductive sensor elements for phase change materials: Thermal conductivity trend analysis*" **Journal of Applied Polymer Science (IF=4.069)** 134(47), 15,12,2017.

17. Mohammad Reza Saeb, Milad Nonahal, Hadi Rastin, Meisam Shabanian, **Mehdi Ghaffari,** Ghasem Bahlakeh, Samira Ghiyasi, Hossein Ali Khonakdar, Vahabodin Goodarzi,

Debora Puglia, "*Calorimetric analysis and molecular dynamics simulation of cure kinetics of epoxy/chitosan-modified Fe3O4 nanocomposites*" **Progress in Organic Coatings (IF=4.469)**112, 176-186, 1,11,2017.

18. MG Khashayar Ghanbari, Morteza Ehsani, Ali Jannesari Ladani, Majid Mohseni, **Mehdi Ghaffari**, "*Thermoanalytical study of siloxane-polyurethane thermosets: Kinetic deconvolution of overlapping heterogeneous curing reactions*" **Progress in Organic Coatings (IF=4.469)** 112, 234-243,1,2017.

19. MG Ghasem Bahlakeh, Bahram Ramezanzadeh, Mohammad Reza Saeb, Herman Terryn, **Mehdi Ghaffari, "** *Corrosion protection properties and interfacial adhesion mechanism of an epoxy/polyamide coating applied on the steel surface decorated with Cerium Oxide film*", **Applied Surface Science (IF=6.182)** 419, 650-669,2017.

20. GB Mohammad Reza Saeb, Hadi Rastin, Meisam Shabanian, **Mehdi Ghaffari**, "*Cure kinetics of epoxy/β-cyclodextrin-functionalized Fe3O4 nanocomposites: Experimental analysis, mathematical modeling, and molecular dynamics simulation*", **Progress in Organic Coatings (IF=4.469)** 110, 172-181,11,2017.

21. KF Mohammad Reza Saeb, Hadi Rastin, Milad Nonahal, **Mehdi Ghaffari**, Ali Jannesari, "*Cure kinetics of epoxy/MWCNTs nanocomposites: Nonisothermal calorimetric and rheokinetic techniques*" **Journal of Applied Polymer Science (IF=4.069)** 134 (35),8,2017

22. Z Soltani, F Ziaie, **M Ghaffari**, AM Beigzadeh, "*Effect of high energy electron beam (10 MeV) on specific heat capacity of low-density polyethylene/hydroxyapatite nano-composite*", **Materials Science and Engineering: C (IF=5.88)** 71, 791-796,2017.

23. M Entezam, MKR Aghjeh, **M Ghaffari**, "*Electron beam irradiation induced compatibilization of immiscible polyethylene/ethylene vinyl acetate (PE/EVA) blends: Mechanical properties and morphology*" **Radiation Physics and Chemistry (IF=2.126)** 131, 22-27,1,2017

24. KF Mohammad Reza Saeb, **Mehdi Ghaffari**, Hadi Rastin, Hossein Ali Khonakdar, "*Biowaste chicken eggshell powder as a potential cure modifier for epoxy/anhydride systems: competitiveness with terpolymer-modified calcium carbonate at low*" **RSC Advances (IF=2.94)** 7 (4), 2218-2230

25. **Mehdi Ghaffari**, Mohammad Reza Saeb, B. Ramezanzadeh, Peyman Taheri, "*Demonstration of epoxy/carbon steel interfacial delamination behavior: Electrochemical impedance and X-ray spectroscopic analyses*", **Corrosion Science (IF=5.245)** 102 (2016) 326–*337.*

26. Ghasem Bahlakeh, **Mehdi Ghaffari**, Mohammad Reza Saeb, Bahram Ramezanzadeh, Frank De Proft, and Herman Terryn, "*A Close-up of the Effect of Iron Oxide Type on the Interfacial Interaction between Epoxy and Carbon Steel: Combined Molecular Dynamics Simulations and Quantum Mechanics*", **J. Phys. Chem. C (IF=4.536)** 2016, 120, 11014−11026

27. **Mehdi Ghaffari**, Morteza Ehsani, Mojtaba Vandalvand, Ehsan Avazverdi, Abdollah Askari, Alireza Goudarzi, "*Studying the effect of micro- and nano-sized ZnO particles on the curing kinetic of epoxy/polyaminoamide system*", **Progress in Organic Coatings (IF=4.469)** 2015, 89, 277–283.

28. Vahabodin Goodarzi, Zahed Ahmadi, Mohammad Reza Saeb, Farkhondeh Hemmati, **Mehdi Ghaffari** and Krzysztof Formela, "*Weldability of pipe grade polyethylenes as realized from thermal and mechanical properties assessments*", **J Polym Eng (IF=1.118)**, DOI: 10.1515/polyeng-2015-0242.

29. **M. Ghaffari**, R. Naderi, M. Ehsani, "*Effect of silane as surface modifier and coupling agent on rheological and protective performance of epoxy/nano-glassflake coating systems*", **Iran Polymer Journal (IF=1.278)**, 2014, 23, 559-567.

30. **Mehdi Ghaffari**, Morteza Ehsani, Hossein Ali Khonakdar "*Morphology, rheological and protective properties of epoxy/nano-glassflake systems*" **Progress in Organic Coatings (IF=2.358)**, 2014, 77, 124–130.

31. P. Taheri, **M. Ghaffari**, J.R. Flores, F. Hannour, J.H.W. de Wit, J.M.C. Mol, H. Terryn, "*Bonding Mechanisms at Buried Interfaces between Carboxylic Polymers and Treated Zinc Surfaces*", **J. Phys. Chem. C (IF=4.835)**, 2013, 117, 2780-2792.

32. Z. Soltani, F. Ziaie, **M. Ghaffari**, H. Afarideh, M. Ehsani, "*Mechanical and thermal properties and morphological studies of 10 MeV electron beam irradiated LDPE/Hydroxyapatite nano-Composite*", **Radiation Physics and Chemistry (IF=1.189)**, 2013, 83, 79-85.

33. **Mehdi Ghaffari**, Morteza Ehsani, Hossein Ali Khonakdar, Guy Van Assche, Herman Terryn, " *The kinetic analysis of isothermal curing reaction of an epoxy resin glassflake nanocomposite*", **Thermochimica Acta (IF=2.105),** Volume 549, 2012, Pages 81-86.

34. **Mehdi Ghaffari**, Morteza Ehsani, Hossein Ali Khonakdar, Guy Van Assche, Herman Terryn, "*Evaluation of curing kinetic parameters of an epoxy /polyaminoamide / nanoglassflake system by non-isothermal differential scanning calorimetry*", **Thermochimica Acta (IF=2.105),** Volume 533, 2012, Pages 10-15.

35. Iraj Rezaeian, Seyed Hassan Jafari, Payam Zahedi, **Mehdi Ghaffari,** Shirin Afradian, "*Improvements of physical and mechanical properties of electron beam irradiation crosslinked EVA foams*", **Polymers Advanced Technology (IF=2.28)**, 2009, 20, 487–492.

36. M.Faker, M.K.Razavi Aghjeh, **M. Ghaffari**, "*Rheology, Morphology and Mechanical Properties of Polyethylene/ Ethylene Vinyl Acetate Copolymer (PE/EVA) Blends*", **European Polymer Journal (IF=2.74)**, 2008, 44, 1834-1842.

Selected International Conference Papers

►Mina Arab, **Mehdi Ghaffari**, Mehdi Entezam, " *Morphology, Swelling Behavior and Antibacterial properties of Poly (Vinyl Alcohol) / nano Zinc Oxide Hydrogel*", 12th International Seminar on Polymer Science and Technology, Islamic Azad University, Tehran, Iran, November 2-5, 2016

► **Mehdi Ghaffari**, Mojtaba Vandalvand, Ehsan Avazverdi, Morteza Ehsani, " *The kinetic analysis of isothermal curing reaction of ZnO filled epoxy resin*", 11th International Seminar on Polymer Science and Technology, Iran Polymer and Petrochemical Institute, Tehran, Iran, Octobr 6-9, 2014

►**M. Ghaffari**, M. Ehsani, H. A. Khonakdar, G. V. Assche, H. Terryn, "*Modeling and experimental verification of the curing kinetics of an Epoxy/Polyaminoamide/Nanoglassflakesystem by DSC*", Physical Chemistry Conference, September, 2012, Tehran, Iran.

►**M. Ghaffari**, M. Ehsani, H. A. Khonakdar, G. V. Assche, H. Terryn, "*Curing kinetic study of epoxy/polyaminoamide/nano-glassflake by isothermal differential scanning calorimetry*", EuroFillers Conference, August, 2011, Dresden, Germany.

►**M. Ghaffari**, M. Ehsani, H. A. Khonakdar, "*Investigation of morphology and rheological propertyes of glassflake/epoxy nanocomposites systems*", ISPST, October, 2012, Tehran, Iran.

►**M. Ghaffari**, M. Ehsani, H. A. Khonakdar, G. V. Assche, H. Terryn, "Study *on rheological properties of epoxy/nano-glassflake composite*", 7th Annual European Rheology Conference, May 2011, Suzdai, Russia.

►M. Ehsani, Y. Jahani, **M. Ghaffari**, "*The Effect of Epoxy-Polyester on Rheology, Morphology and Mechanical Properties of Talc-Reinforced Polypropylene*".European Polymer Congers, EPF 2009, Graz, Austria, 2009.

References

1. **Prof. Herman Terryn**
   Professor at the Faculty of Engineering, Vrije University of Brussels (VUB).
   Part-time professor at the Department of Materials Science and Engineering, TU Delft.
   hterryn@vub.ac.be
   https://www.surfgroup.be/
2. **Prof. Morteza Ehsani**
   Professor at the Iran Polymer and Petrochemical Institute, Tehran, Iran
   m.ehsani@ippi.ac.ir
   www.ippi.ac.ir
3. **Dr. Peyman Taheri**
   Assistant Professor at the Department of Materials Science and Engineering, TU Delft
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4. **Prof. Guy van Assche**
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   http://www.vub.ac.be/MACH/FYSC/