MOHSEN MOHSENNIA

CHEMICAL ENGINEERING PROFESSOR

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RESEARCH INTERESTS:

- (I) Molecular thermodynamics (Both theoretical and experimental approaches for evaluation of thermodynamic properties and fluid phase equilibria of pure and mixture of fluids).
- (II) Advanced nanomaterials (Physical, chemical and green synthesis of novel nanomaterials and multifunctional polymer nanocomposites, followed by their characterization and evaluation for industrial applications including membrane separations, photocatalysts, lithium-ion batteries, oil and gas.
- (III) Computational chemistry (Theoretical study of the effects of doping and vacancy on geometric and electronic structures of nanomaterials in presence and absence of static electric fields).

EMPLOYMENT:

Vice provost of development and economic planning, University of Kashan, Kashan, Iran, 2015-2018.

California Institute of Technology, CA, USA. Visiting research fellow, 2012.

Editor-in-chief, Energy: Engineering and Management Journal, Iran, 2011-present.

Dean of department of chemistry, University of Kashan, Kashan, Iran, 2009-2011.

Chair of national committee of ISO standards (ISIRI/TC 107), Iran, 2009-2011.

Director of chemical engineering operations laboratory, University of Kashan, Kashan, Iran, 2004-2011.

Dean of department of chemical engineering, University of Kashan, Kashan, Iran, 2004-2008.

Dean of department of science, University of Kashan, Kashan, Iran, 1997-1999.

Dean of department of chemistry, University of Kashan, Kashan, Iran, 1998-1998.

Founder and head of essential oil committee, University of Kashan, Iran, 1993-1996.

Professor of chemical engineering, chemical engineering department, University of Kashan, Iran, 2006.

Adjunct professor, Amirkabir University of Technology, Tehran, Iran, 2007-2011.

Research professor, Amirkabir University of Technology, Tehran, Iran, 1993-2007.

Associate professor of chemical engineering, department of chemistry, University of Kashan, Iran, 2002-2006.

INDUSTRIAL EXPERIENCES:

Production of industrial adhesive, sizing agent and auxiliary chemicals for textile industries.

Founder and CEO, Kashan Chemical corporation, Kashan, Iran, 1995-2008.

Production of poly (vinyl acetate) resin (PVAc).

Board member, Kashan Chemical Industries corporation, Kashan, Iran, 1993-1995.

Electroplating on conductive and non-conductive (polymer) surfaces.

Founder and CEO, Technical corporation, Tehran, Iran, 1989-1993.

Metal finishing processes, 1983-1987.

Manager and supervisor, Shibe company, Tehran, Iran, 1983-1989.

EDUCATION:

Amirkabir University of Technology, Tehran, Iran. Ph.D., Chemical Engineering, 1993. University of Illinois at Chicago, IL, USA. Ph.D. Student (Scholarship), Chemical Engineering, 1992.

Amirkabir University of Technology, Tehran, Iran. M.S., Chemical Engineering, 1985. Amirkabir University of Technology, Tehran, Iran. B.S., Chemical and Petrochemical Engineering, 1983

HONORS and AWARDS:

University excellence award for outstanding performance in research, University of Kashan, Iran, 2011.

University excellence award for outstanding performance in research, University of Kashan, Iran, 2008.

National research and technology excellence award for outstanding performance in research, Ministry of Science, Iran, 2006.

University excellence award for outstanding performance in research, University of Kashan, Iran, 2005.

TEACHING:

Kinetic and reactor design, Amirkabir University of Technology, Tehran, Iran. Applied chemistry, Amirkabir University of Technology, Tehran, Iran.

Statistical thermodynamics, University of Kashan, Kashan, Iran.

Advanced thermodynamics, University of Kashan, Kashan, Iran.

Advanced mathematics, University of Kashan, Kashan, Iran.

Advanced chemical physics, University of Kashan, Kashan, Iran.

Advanced statistical thermodynamics, University of Kashan, Kashan, Iran. Physical chemistry, University of Kashan, Kashan, Iran.

PUBLICATIONS (SELECTED):

H Azad, M Mohsennia, C Cheng, A Amini, Alkaline treatment of antifoulant PVB/SA-grafted ε-MnO₂ adsorptive nanocomposite membrane for synchronous separation of pollutants from pharmaceutical effluents, Journal of Water Process Engineering (2023) 53, 103756

F Nourbakhsh, M Mohsennia, M Pazouki, Electrochemical impedance spectroscopy studies

of the buffered and non-buffered microbial fuel cell, Fuel Cells (2023) 23 (2), 214-220

H Azad, M Mohsennia, Chun Cheng, Abbas Amini, Cross-linked poly (vinyl butyral)/amine-functionalized polyacrylonitrile adsorptive membrane nano-composited with CeO₂ nanoparticles for simultaneous aqueous removal of heavy metals and cefotaxime, Chemical Engineering Journal 435 (2022) 134849.

M Afsharizadeh, M Mohsennia, Novel rare-earth metal oxides-zirconia nanocatalysts for biodiesel production from corn oil and waste cooking oil, Fuel 15 (2021) 121350.

H Azad, M Mohsennia, Chun Cheng, Abbas Amini, Facile fabrication of PVB-PVA blend polymer nanocomposite for simultaneous removal of heavy metal ions from aqueous solutions: Kinetic, equilibrium, reusability and adsorption mechanism, Journal of Environmental Chemical Engineering 9 (2021) 106214.

J Ebrahimian, M Mohsennia, M Khayatkashani, Catalytic and photocatalytic activity of *Urtica dioica*-mediated *Ud*-ZnO nanoparticles, Optical Materials, 120 (2021) 111404.

J Ebrahimian, M Mohsennia, M Khayatkashani, Green synthesis and characterization of Ud-SnO₂-ZnO using Urtica dioica leaf extract: A nanocomposite photocatalyst for degradation of Rhodamine B dye, Research on Chemical Intermediates, 47 (2021) 4789–4802.

H Azad, M Mohsennia, A novel free-standing polyvinyl butyral-polyacrylonitrile/ZnAl-layered double hydroxide nanocomposite membrane for enhanced heavy metal removal from wastewater, Journal of Membrane Science (2020) 615, 118487.

J Ebrahimian, M Mohsennia, M Khayatkashani, Photocatalytic-degradation of organic dye and removal of heavy metal ions using synthesized SnO₂ nanoparticles by *Vitex agnus-castus* fruit via a green route, Materials Letters (2020) 263, 15, 127255.

T Afshari, M Mohsennia Structural and electronic properties of adsorbed nucleobases on pristine and Al-doped coronene in absence and presence of external electric fields: a computational study, Structural Chemistry (2020) 31, 795-807.

F Nourbakhsh, M Mohsennia, M Pazouki, Highly efficient cathode for the microbial fuel cell using LaXO₃ ($X = [Co, Mn, Co_{0.5}Mn_{0.5}]$) perovskite nanoparticles as electrocatalysts (2020) SN Applied Sciences 2, 1-9

Z S Aghamiri, M Mohsennia, H A Rafiee-Pour, Immobilization of cytochrome *c* on polyaniline/ polypyrrole/carboxylated multi-walled carbon nanotube/glassy carbon electrode: Biosensor fabrication, Journal of Solid-State Electrochemistry (2019) 23, 7, 2233–2242.

M Afsharizadeh, M Mohsennia, Catalytic synthesis of biodiesel from waste cooking oil and corn oil over zirconia-based metal oxide nanocatalysts, Reaction Kinetics, Mechanisms and Catalysis (2019) 128, 1, 443–459.

B Borhani, M Mohsennia, M Shakourian-Fard, Structural and electronic properties of adsorbed nucleobases on Si- doped hexagonal boron nitride nanoflake: a computational study, Structural Chemistry (2019) 30, 4, 1277–1287.

T Afshari, M Mohsennia, A molecular electron density theory study of Diels-Alder reaction between Danishefsky's diene and (2E)-3-phenyl-2-(trifluoromethyl) acrylonitrile, J. Phys Org Chem, (2019) 32, 6.

T Afshari, M Mohsennia, Effect of the Si, Al and B doping on the sensing behavior of carbon nanotubes toward ethylene oxide: A computational study, Molecular Simulation (2019) 45, 16, 1384-1394.

M. Mohsennia, M. Rakhshi and M. Rezaei Sameti, Adsorptive Removal of Nerve Agent Gases by Carbon Nanotubes: A Density Functional Theory Study, Journal Zeitschrift für Physikalische Chemie (2019) 1498.

T Afshari, M Mohsennia Effect of external electric field on the adsorption of ethylene oxide on pristine and Al- doped coronenes: A DFT study, Journal of Theoretical and Computational Chemistry (2018) 17, 5, 1850032.

M Rakhshi, M Mohsennia, H Rasa, XH3 (X = P or N) Adsorption on Pristine, Pt-Doped and Vacancy-Defective (8,8) Boron Nitride Nanotubes: DFT Calculations, Zeitschrift für Physikalische Chemie (2018) 233, 3, 431-447.

T Afshari, M Mohsennia A molecular electron density theory study of the asymmetric hetero-Diels-Alder cycloaddition reaction between ferrocenyl-substituted thiabutadiene and methyl propiolate. Computational and Theoretical Chemistry (2018) 1140, 15, 117-124.

A M Koushki, R Sadighi-Bonabi, M Mohsennia, E Irani, The control of electron quantum trajectories on the high-order harmonic generation of CO and N2 molecules in the presence of a low frequency field, Journal of chemical physics (2018) 148, 14, 144306.

- Z S Aghamiri, M Mohsennia, HA Rafiee-Pour, Immobilization of cytochrome c and its application as electrochemical biosensors, Talanta (2018) 176, 195-207.
- Z S Aghamiri, M Mohsennia, HA Rafiee-Pour, Fabrication and characterization of

cytochrome c-immobilized polyaniline/multi-walled carbon nanotube composite thin film layers for biosensor applications, Thin Solid Films (2018) 660, 30, 484.

T Afshari, M Mohsennia, A molecular electron density theory study of the asymmetric hetero-Diels-Alder cycloaddition reaction between ferrocenyl-substituted thiabutadiene and methyl propiolate, Computational and Theoretical Chemistry (2018) 1140, 15, 117-124.

M Mohsennia, M Rakhshi, H Rasa, A computational study on interactions of Ni-and Pt-doped boron nitride nano tubes with NH3 in presence and absence of electric fields, Computational and Theoretical Chemistry (2018) 1136, 1-9.

M Mohsennia, M Rakhshi, H Rasa, MR Sameti, First-principle study of ammonia molecules adsorption on boron nitride nanotubes in presence and absence of static electric field and ion field, Vacuum, (2018) 155, 456 -464.

A M Koushki, R Sadighi-Bonabi, M Mohsen-Nia, E Irani, High-order harmonic generation of CO and N2 molecules under linearly-and bi circularly-polarized laser pulses by TD-DFT, Laser Physics (2018) 28, 7, 075404.

H Hatefi, M Mohsennia, H Niknafs, A Golzary, Catalytic production of biodiesel from corn oil by metal-mixed oxides, Pollution (2017) 3 (4), 679-688.

- F. Nourbakhsh, M. Mohsennia, M. Pazouki, Nickel oxide/carbon nanotube/polyaniline nanocomposite as bifunctional anode catalyst for high-performance Shewanella-based dual-chamber microbial fuel cell, Bioprocess and Biosystems Engineering (2017) 40, 3, 1669–1677.
- F. Nourbakhsh, M. Pazouki, M. Mohsennia, Impact of modified electrodes on boosting power density of microbial fuel cell for effective domestic wastewater treatment: A case study of Tehran, Journal of Fuel Chemistry and Technology (2017) 45, 871-879.

Hamideh Amiri, M. Mohsennia, Impedance study of PVA/PEG/LiClO₄/TiO₂ nanocomposite solid polymer blend electrolyte, J Mater Sci: Mater Electron (2017) 28, 4586.

M. Mohsennia, B. Niknahad, A. Eliassi, Effect of polymerization/complexation agents molar ratio on structure and catalytic activity of La_{0.7}Ba_{0.3}Co_{0.3}Ni_{0.7}O₃ nanocatalyst in low-temperature CO oxidation, J Sol-Gel Sci Technol (2017) 82, 458-467.

A M Koushki, M Mohsennia, R. Sadighi-Bonabi, E. Irani, Ionization dynamics of orbitals and high-harmonic generation of N₂ and CO molecules at the various XC potentials by TD-DFT, Computational and Theoretical Chemistry (2016) 1095, 104-111.

M. Mohsennia, Maryam Massah Bidgoli, Mohammad Hossein Khoddami, Alireza Salehi,

Farhad Akbari Boroumand, Bulk-heterojunction polymer solar cells with polyaniline-silica nanocomposites as an efficient hole- collecting layer, J. of Nanophotonics (2016) 10, 1.

Bahareh Niknahad, M. Mohsennia, Ali Eliassi, Influence of preparation methods on the structure and catalytic performance of nanostructured La_{0.7}Ba_{0.3}Co_{0.3}Ni_{0.7}O₃ for CO oxidation, Reaction Kinetics, Mechanisms and Catalysis (2016) 117, 2, 537-550.

E Esmizadeh, M Moghri, MR Saeb, M Mohsen Nia, N Nobakht, NP Bende, Application of Taguchi approach in describing the mechanical properties and thermal decomposition behavior of poly (vinyl chloride)/clay nanocomposites: Highlighting the role of organic modifier, Journal of Vinyl and Additive Technology (2016) 22 (3), 182-190

- M. Mohsennia, Fateme Abadian, Naeime Abadian, Keivan Mosaiebi Dehkordi, Maryam Keivani, Mohamadreza Abadyan, Analysis of cantilever NEMS in centrifugal-fuidic systems, International J. of Modern Physics B (2016) 30, 2, 1650148.
- M. Massah Bidgholi, M. Mohsennia, F. A. Boroumand, Low driving voltage characteristics of polyaniline-S₂ silica nanocomposites as hole-injection material of organic electroluminescent devices, Materials Research Bulletin (2015) 72, 29-34.
- M. Massah Bidgholi, M. Mohsennia, F. A. Boroumand, Synthesis of Carboxylated Graphene Oxide-CdS Nanocomposite and Its Application on Photovoltaic Devices, Bulletin of the Chemical Society of Japan (2015) 88, 5, 684-689.
- M. Mohsennia, M. Massah Bidgoli, and F. A. Boroumand, A. Mohsennia, Electrically conductive polyaniline as hole-injection layer for MEH-PPV:BT based polymer light emitting diodes, Materials Science and Engineering: B (2015) 197, 25-30.
- MM Bidgoli, M Mohsennia, FA Boroumand, AM Nia, Optoelectronic characteristics of MEH-PPV+ BT blend thin films in polymer light emitting diodes, Semiconductor Science and Technology (2015) 30 (6), 065016.
- M. Mohsennia, M. Massah Bidgoli, and F. A. Boroumand, A.R. Khademi, Use of a New Blue Emitter in Color- Stable, Flexible, Polymeric White Light-Emitting Diodes with a Simple Structure, J. of Electronic Material (2015) 44, 8, 2745-2753.
- M. Mohsennia, M. Massah Bidgoli, and F. A. Boroumand, Low driving voltage in polymer light emitting diodes with CdS nanoparticles as an electron transport layer, J. of Nanophotonics (2015) 9, 1.
- M. Mohsen-Nia, A modified MMM EOS for high-pressure PVT calculations of heavy hydrocarbons, Journal of Petroleum Science and Engineering (2014) 113, 97-103.

- M. Karimi, M. Mohsennia, A. Akbari, Electro-separation of synthetic azo dyes from a simulated wastewater using polypyrrole/polyacrylonitrile conductive membranes, J. Water Process Eng. (2014) 4, 6-11.
- F. S. M. Doulabi, M. Mohsennia, S. Taraghikhah, Synthesis and characterization of magnetic Ni_{0.3}Zn_{0.7} Fe₂O₄/polyvinyl acetate (PVAC) nanocomposite, J. of Polymer Engineering (2014), 34 9.
- M. Mohsen-Nia, H. Amir, Measurement and modelling of static dielectric constants of aqueous solutions of methanol, ethanol and acetic acid at T = 293.15 K and 91.3 kPa, J. Chem. Thermodyn (2013) 57, 67-70.
- M. Mohsen-Nia and M.R. Memarzadeh, Characterization and non-isothermal crystallization behavior of biodegradable poly (ethylene sebacate)/SiO2 nanocomposites, Polymer Bulletin (2013) 70, 8, 2471-2491.
- A Aleghafouri, M Mahdyarfar, A Mohajeri, M Mohsen Nia, M Asghari, Comparison of DA, DS and HK Models in Determination of Pore Size Distribution of Microporous Carbon Adsorbents Using CO2 Adsorption, Journal of Petroleum Research (2013) 21 (68), 32-43.
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- M. Mohsen-Nia, A.H. Ebrahimabadi, B. Niknahad, Partition coefficient n-octanol/water of propranolol and atenolol at different temperatures: Experimental and theoretical studies, J. Chem. Thermodyn (2012) 54, 393-397.
- M. Mohsen-Nia, F. S. Mohammad Doulabi, Preparation and characterization of exfoliated poly (vinyl acetate-co-methyl methacrylate)/Cloisite 30B nanocomposite, Polymer Bulletin (2012) 68, 6, 1663-1675.
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- F. S. Mohammad Doulabi, M. Mohsen-Nia, Magnetic cobalt-zinc ferrite/PVAc nanocomposite: synthesis and characterization Iranian Polym J, (2013) 22, 9-14.

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- Abbas Aleghafouri, M. Mohsen-Nia, Ali Mohajeri, Mohammad Mahdyarfar, Morteza Asghari, Micro- pore Size Analysis of Activated Carbons Using Nitrogen, Carbon dioxide and Methane Adsorption Isotherms: Experimental and Theoretical Studies, J. of Adsorption Science and Technology (2012) 30, 4, 307-316.
- M. Mohsen-Nia, M. Massah Bidgoli, M. Behrashi, A. Mohsen Nia, Human serum protein adsorption onto synthesis nano-hydroxyapatite, Protein Journal, 31, 2012, 150-157
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- M. Mohsen-Nia, F. S. Mohammad Doulabi PVAc Microspheres via Semicontinuous Emulsion Polymerization: Synthesis, Characterization, Kinetic, and Surface Morphology Studies, J of Adhesion (2011) 87, 10, 1020-1037.
- M. Mohsen-Nia, Measurement and modeling of surface tensions of systems containing n-hexadecane, n-heptane and n-pentane, Physics and Chemistry of Liquids (2011) 49, 5, 608-614.
- FSM Doulabi, M Mohsen-Nia, H Rasa, Ternary Liquid—Liquid Equilibria for the (Methanol+ Methylbenzene+ Decane) System at Different Temperatures, Journal of Chemical & Engineering Data (2011) 56 (4), 1366-1370
- M. Mohsen-Nia, F.S. Mohammad Doulabi, Separation of aromatic hydrocarbons (toluene or benzene) from aliphatic hydrocarbon (n-heptane) by extraction with ethylene carbonate, J Chem Thermodyn (2010) 42,10, 1281- 1285.
- M. Mohsen-Nia, H. Amiri and B. Jazi, Dielectric constant of water, methanol, ethanol, butanol and acetone: Measurement and computational study, J. of Solution Chemistry (2010) 39, 5, 701-708.
- Rezaei, H., Modarress, M. Mohsen-Nia, M., Amiri, M. Application of M4 cubic equation of state for refrigerants, International J. of Refrigeration (2010) 33, 7, 1350-1355.
- M. Mohsen-Nia, M.R. Memarzadeh Isobaric Vapor-Liquid Equilibria of Heptane + 1-Butanol and Heptane + 1- Pentanol Systems at (53.3and91.3) kPa, J. Chem. Eng. Data, (2010) 55, 6, 2140-2144.

- M. Mohsen-Nia, M.R. Memarzadeh, Isobaric vapor-liquid equilibria for the 1-propanol + 1-butanol binary mixture at 53.3 and 91.3 kPa, J Chem Thermodyn (2010) 42, 792-796.
- H. Rezaei, H. Modarress, M. Mohsen-Nia, Extension of the new proposed association equation of state (AEOS) to associating fluid mixtures. J Chem Thermodyn (2010) 42, 6, 808-816.

Mani Safamirzaei, Hamid Modarress, M. Mohsen-Nia, Modeling the hydrogen solubility in methanol, ethanol, 1- propanol and 1-butanol, Fluid Phase Equilibria (2010) 289, 1, 25, 32-39.

- M. Mohsen-Nia, H. Rasa, F. Naghibi, Experimental and theoretical study of surface tension of n- pentane, n- heptane and some of their mixtures at different temperatures, J Chem Thermodyn, (2010) 42, 1 110-113.
- M. Mohsen-Nia, M.R. Memarzadeh, Isobaric vapour-liquid equilibria for the (1-pentanol + propionic acid) binary mixture at 53.3 kPa and 91.3 kPa, J Chem Thermodyn (2010) 42, 11, 1311-1315.
- M. Mohsen-Nia, H. Rasa, Measurments and calculations of hydrocarbon mixtures liquid density by simple cubic equations of state. Physics and Chemistry of Liquids (2009) 47, 2, 140-147.
- M. Mohsen-Nia, B. Jazi and H. Amiri, Binodal curve measurements for (water + propionicacid + dichloromethane) ternary system by cloud point method, J Chem Thermodyn (2009) 41, 7, 859-863.
- M. Mohsen-Nia, H. Modarress, F. Alimohammady Densities and Viscosities of Binary Mixtures of Poly(vinylchloride) and Tetrahydrofuran at Temperatures (283.15to303.15) K, J. Chem. Eng. Data, (2009) 54, 4, 1375-1377.
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- M. Mohsen-Nia, F.S. Mohammad Doulabi and V.I. Manousiouthakis, (Liquid + liquid) equilibria for ternary mixtures of (ethyleneglycol + toluene + n-octane) J Chem Thermodyn (2008) 40, 8, 1269-1273.
- M. Mohsen-Nia, Hamid Modarress, Hamid Reza Nabavi, Measuring and Modeling Liquid Liquid Equilibria for a Soybean Oil, Oleic Acid, Ethanol, and Water System, J Am Oil Chem Soc (2008) 85, 10, 973-978.

- M. Mohsen-Nia and A. Khodayari, De-acidification of sunflower oil by solvent extraction: (Liquid + liquid) equilibrium data at T = (303.15 and 313.15) K, J Chem Thermodyn (2008) 40, 8, 1325-1329.
- Mani Safamirzaei, Hamid Modarress, M. Mohsen-Nia, Modelling and predicting the Henry's law constants of methyl ketones in aqueous sodium sulphate solutions with artificial neural network Fluid Phase Equilibria (2008) 266, 1, 187-194.
- H. Rasa, M. Mohsen-Nia, H. Modarress, Phase separation in aqueous two-phase systems containing poly (ethylene glycol) and magnesium sulphate at different temperatures, J Chem Thermodyn (2008) 40, 4, 573-579.
- H. Modarress, M. Mohsen-Nia, Mani Safamirzaei, Modelling the Solubility of 1,1,1,2-Tetrafluoroethane, 1-Chloro-1,1-difluoroethane, Butane and Iso-butane in LDPE with Artificial Neural Network, Iranian Polyme, 17, 7.
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- M. Mohsen-Nia, H. Rasa and H. Modarress, Liquid-Liquid Equilibria for the Poly (ethyleneglycol + Water + Copper Sulphate) System at Different Temperatures, J. Chem. Eng. Data (2008) 53, 4, 946-949.
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- M. Mohsen-Nia, H. Modarress, Association equation of state (AEOS) based on aggregate formation for pure substance, Chemical Physics (2007) 336, 1, 22-26.
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