

# Farzam Javadpour

## Professional Summary

May 9, 2021

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### Professional Preparation

#### Academic Background

B.Sc. with Honors Petroleum Engineering, Petroleum University of Technology, Iran,  
M.Sc. Chemical & Petroleum Engineering, University of Calgary, Canada,  
Ph.D. Chemical & Petroleum Engineering, University of Calgary, Canada,

#### Professional Appointments

Research Scientist, Bureau of Economic Geology, Jackson School of Geosciences, The University of Texas at Austin (September 2014-Present)

Research Associate, Bureau of Economic Geology, The University of Texas at Austin (May 2008-August 2014)

- o Established and led a nanotechnology research laboratory equipped with state-of-the-art atomic force microscope (AFM), set-up assembly of nanoparticle transport in porous media, particle analyzer, and computational facility.

- o Studied pores at nanometer scale in kerogen and inter/intra granular pore spaces of shale samples.

- o Developed new gas flow formulation to replace Darcy permeability for shale gas reservoirs.

- o Used the new gas flow model to modify pulse decay permeability measurements for shale samples.

- o Used the new gas flow model to build models for gas flow in matrix-fracture networks.

- o Developed an analytical model to estimate 'lost gas' from shale canister data. Lost gas estimation is important to determine gas-in-place (GIP) in shale gas reservoirs.

- o Measured intermolecular forces between liquid molecules and pore walls in shale to determine slip coefficients for oil and water flow models in shale gas system.

- o Measured microscopic nanoparticle deposition rate coefficients on different geological minerals using force microscopy. This method replaces time-consuming core flood experiments.

- o Developed detachment criteria for attached particles in porous media. A balance between computed hydrodynamic and measured surface forces used to develop criteria for particle shear off, roll off, and attachment.

- o Studied the applicability of nanoparticles to enhance CO<sub>2</sub> storage and sequestration in deep saline aquifers.
- o Studied the applicability of commingled storage of depleted uranium and CO<sub>2</sub> in deep saline aquifers.
- o Designed and fabricated microfluidic physical models ('porous microchip') to study transport of nanoparticle in porous media. Joint project with the University of Calgary (Canada).
- o Designed and modified for the first time an AFM set-up to directly measure interactive forces between nanoparticles and fluid interfaces (liquid-air and liquid-liquid). Joint project with the University of Calgary (Canada).

Research Scientist, Alberta Research Council, Calgary, Alberta, Canada (July 2006 - May 2008). Developed mathematical models for gas flow in nanopores in shale gas sediments; developed upscale theory to relate pore level events to the macroscale coefficients applicable for CO<sub>2</sub> injection into geological formations; developed model to relate pore-size distribution and permeability in shale gas and caprock seals using the concept of long-range force at the molecular scale; conducted industrial research on CO<sub>2</sub> injection in geological formations for Enhanced Gas Recovery (EGR); conducted detailed study of 21 patterns in a water-flooded reservoir to find the best location and scenario for CO<sub>2</sub> injection to maximize oil recovery and sequester CO<sub>2</sub>.

Instructor, University of Calgary, Calgary, Alberta, Canada (July 2003 - May 2008). Taught "Properties of Solids, Liquids, and Gases" course and its lab.

Ph.D. student, University of Calgary, Calgary, Alberta, Canada (2001 - 2006). Developed micromodels for the study of particle transport in porous media; performed Atomic Force Microscopy (AFM) to measure interactive forces between particles and the solid matrix in porous media; modified Taylor-Aris dispersion theory to include the finite size of the particles and their surface interactive forces; also taught a variety of chemical and petroleum engineering courses as a TA.

M.Sc. Student, University of Calgary, Calgary, Alberta, Canada (1999 - 2001). Modified a network model of porous media to study isolated bubble movement in a saturated porous media; taught petroleum engineering courses as a TA.

Reservoir Engineer, National Iranian Oil Company, Ahwaz, Iran (1992 - 1999). Performed experiments using slim-tube miscibility apparatus and core flooding to determine miscibility of hydrocarbon gas and oil for a giant light oil reservoir; performed PVT experiments and data analysis; tuned Equation of States for the oil and gas of interest to use in a compositional simulator; performed compositional simulation to match slim-tube and core-flood experiments; taught reservoir rock properties and reservoir fluid properties courses.

## Continuing Education Courses Taken

Capillarity in Porous Media at Different Scales, short course by Professor Majid Hassanizadeh: The Academy of Porous Media, International Society for Porous Media (InterPore), Zoom meeting, January 12-15, 2021

Modern well test analysis: Stanford University, Palo Alto, California, August 18-20, 2014

Understanding well performance and optimizing completions in the bakken: Society of Petroleum Engineers, San Diego, California, December 10-12, 2013

The Key Exploration and Development Technology of Low Permeability and Extra-low Permeability Oil Reservoir: McCombs School of Business, The University of Texas at Austin, Austin, Texas, December 2012

Shale PVT and sampling: Society of Petroleum Engineers, Houston, Texas, November 4, 2012

Reserve and Deliverability Estimation in Shale Gas Reservoir: McCombs School of Business, The University of Texas at Austin, Austin, Texas, November 2012

Shale oil and tight oil fundamentals: Society of Petroleum Engineers, Houston, Texas, October 7, 2012

Fundamentals of shale gas production,: PetroChina Research Laboratory, Beijing, China, March 2012

Business writing: Continuing & Innovation Education, The University of Texas at Austin, Austin, Texas, November 18, 2010

Clear & confident speech: Continuing & Innovation Education, The University of Texas at Austin, Austin, Texas, November 16, 2010

Organic facies, maturity & 3D modeling in unconventional: American Association of Petroleum Geologists, Houston, Texas, October 7-8, 2010

Log analysis of shaly sands: American Association of Petroleum Geologists, Houston, Texas, October 6, 2010

Reservoir characterization & production properties of gas shales: American Association of Petroleum Geologists, Houston, Texas, October 4-5, 2010

Basics for completions, stimulation and production operations in gas shales: Society of Petroleum Engineers, Houston, Texas, May 11-12, 2010

Molecular Dynamics Simulation, NSTI Nanotech: Nanotechnology Conference and Trade Show, Boston, Massachusetts, June 1, 2008

Short Course on Shale Gas: 9th Annual Unconventional Gas Conference, Canadian Society for Unconventional Gas, Calgary, Alberta, November 16, 2007

Field Trip: Shale Gas Sediments in Western Canada, Calgary, Alberta, September 27-29, 2007

Effective Communications Workshop: Organizational Health Inc., Calgary, Alberta, July 27, 2007

Hydraulic Fracturing: Schlumberger, Calgary, Alberta, May 7-8, 2007

Oil Field Management Software Fundamentals: Education Services, Schlumberger Information Solution, Calgary, Alberta, December 13-14, 2006

Project Management 101: Inter-Think Consulting Inc., Calgary, Alberta, September 20-22, 2006

## Areas of Expertise

### Areas of Expertise

Atomic force microscopy (AFM) and its application in mudrock engineering

CO<sub>2</sub> injection in geological formations

Gas flow and permeability in mudrocks and shale gas reservoirs

Liquid flow in shale gas reservoirs

Microfluidic/Nanofluidic models of porous media; design, fabrication, and image analysis

Multiscale experimental analysis and mathematical upscaling of transport in porous media

Reserve estimation and production evaluation of shale gas and oil reservoirs

Transport of micro- and nanoparticles in porous media

## Awards

### Awards and Honorary Societies

A Peer Apart Award: Society of Petroleum Engineers [achievement of more than 100 reviews

completed during the service for SPE peer-reviewed journals], 2014

Society of Petroleum Engineers (SPE) Outstanding Service Award for the role of Associate Editor of the SPE-Journal of Canadian Petroleum Technology, 2010

Best Paper, 2008, SPE Journal of Canadian Petroleum Technology, 2009

Achievement Award, Conventional Oil and Gas business unit, Alberta Research Council, 2008

Dr. M. Butler Memorial Best Paper presented at Canadian International Petroleum Conference, 2007

National Science and Engineering Research Council (NSERC) postdoctoral award, Canada, 2007

Nominated as the "Rookie of the Year", Alberta Research Council, 2007

Winner of the "Divisional Award," Alberta Research Council, 2007

Faculty of Graduate Studies Scholarship, University of Calgary, Canada, 2001 - 2005

Province of Alberta Graduate Fellowship, University of Calgary, Canada, for 4 years, 2001 - 2005

Best student paper presented in Purification and Analysis session of the 53rd Canadian Chemical Engineering Conference (CSChE2003), Hamilton, Canada, 2003

Graduate Students' Association Academic Projects fund, University of Calgary, 2003

First place at the Canadian Institute of Mining, Metallurgy and Petroleum (CIM), Student Essay Competition, Canada, 2002

Second place Student Paper Competition, 52nd Canadian Chemical Engineering Conference (CSChE2002), Vancouver, Canada, 2002

Graduate Conference Travel Grant, Faculty of Graduate Studies, U. of Calgary, Canada Engineering Conference (CSChE2002), Vancouver, Canada, 2001

Graduate Students' Association Academic Projects fund, University of Calgary, 2001

DB Robinson Associates Ltd. Graduate Research Travel Grant, Canada, 2000

Graduate Conference Travel Grant, University of Calgary, Canada, 2000

Graduate Students' Association Academic Projects fund, University of Calgary, 2000

Ian N. McKinnon Memorial Fellowship, University of Calgary, Canada, 2000

## Service

### University Committees

Chair, Equipment Committee, Jackson School of Geosciences, The University of Texas at Austin, June 1, 2013-August 31, 2014

### External Committees Participation

Technical Reviewer, Journal of Marine and Petroleum Geology, September 2016-Present

Technical Reviewer, Journal of Natural Gas and Engineering, February 2016-Present

Technical Reviewer, International Journal of Heat and Mass Transfer, December 2015-Present

Technical Reviewer, Mathematical Geosciences, November 2015-Present

Technical Reviewer, Microfluidics and Nanofluidics, November 2015-Present

Technical Reviewer, PLOS ONE, November 2015-Present

Technical Reviewer, American Geophysical Union--Book, October 2015-Present

Technical Reviewer, Scientific Reports (Nature), October 2015-Present

Technical Reviewer, Water Resources Research, October 2015-Present

Research Proposal Reviewer, Swiss National Science Foundation (SNF), Switzerland, September 2015-Present

Technical Reviewer, Journal of Marine and Petroleum Geology, September 2015-Present

Research Proposal Reviewer, National Science Center, Poland, May 2014-Present

Research Proposal Reviewer, Discovery Grant, National Science and Engineering Research Council of Canada (NSERC), October 2013-Present

Research Proposal Reviewer, American Chemical Society (ACS) Petroleum Research Fund, USA, February 2010-Present

Associate Editor, Journal of Canadian Petroleum Technology, Society of Petroleum Engineers, 2010 - present

Reviewer, Journal of Canadian Petroleum Technology, Society of Petroleum Engineers, 2010 - present

Reviewer, Journal of Colloid and Interface Science, Elsevier, 2010 - present

Reviewer, SPE Formation Evaluation, Society of Petroleum Engineers, 2010 - present

Associate Editor, Journal of Canadian Petroleum Technology, Society of Petroleum Engineers, 2010

Chair, Theme Session: Nanogeosciences in Mudrocks and Shale-Gas Strata, March 28-29, New Orleans, Geological Society of America, 2010

Technical Reviewer, Transport in Porous Media, Springer, 2010

Co-Chair, Pore Network and Fluid Flow in Mudrocks, 2009 Annual American Association of Petroleum Geologists Convention, Denver, Colorado, 2009

Technical Reviewer, Journal of Colloid and Interface Science, Elsevier, 2009

Issue Coordinator, Journal of Canadian Petroleum Technology, Society of Petroleum Engineers, 2006 - 2009

Member, Technical Committee, Journal of Canadian Petroleum Technology, 2004 - 2008

Coordinator, International Graduate Student Paper Competition, CSE 2005 Conference, Calgary, Alberta, Canada, 2005

Co-Chair, Reservoir Simulation Session, Canadian International Petroleum Conference, 2004 - 2005

Representative, Graduate Students, Department of Chemical and Petroleum Engineering, University of Calgary, 2004 - 2005

Scientific Secretary, World Petroleum Conference, Calgary, Alberta, Canada, 2000

## Teaching and Advising

### University Courses Taught

Advances in CO<sub>2</sub> injection and storage in geological formations: presented to The University of Texas at Austin, Austin, Texas, August 15, 2010-December 20, 2011.

Properties of solids, liquids, and gases (undergraduate course and its labs): presented at The University of Calgary, Calgary, Alberta, Canada, July 1, 2003-August 27, 2007.

Advances in unconventional shale gas resources: presented to The University of Texas at Austin, Austin, Texas, August 15, 2010-Present.

## Continuing Education Courses Taught

The key exploration and development technology of low permeability and extra-low permeability oil reservoir: presented to McCombs School of Business, The University of Texas at Austin, Austin, Texas, December 4, 2012.

Reserve and deliverability estimation in shale gas reservoir: presented to McCombs School of Business, University of Texas at Austin, Austin, Texas, November 8, 2012.

Fundamentals of shale gas production: presented to PetroChina Research Laboratory, Beijing, China, March 12-16, 2012.

Questions, answers, and challenges in mudrock systems research: technologies and applications for shale reservoir successions: presented at Upstream Research Company, ExxonMobil, Houston, Texas, November 20, 2008.

CO<sub>2</sub> injection in geological formations: short course, Hongzhu, China, September 2008.

Shale gas characterization: presented at CNPC Petroleum Center, Changchun, China, June 2008.

## Presentations

### Invited Presentations

Nanofluids for EOR and IOR: presented to China University of Petroleum (East China), virtual, November 27, 2020.

EOR in Low-Permeability Tight Oil Reservoirs: presented at International Seminar on EOR 2019, Daqing, China, August 17-18, 2019.

Single-Phase Liquid and Two-Phase Flow in Tight Reservoirs: presented at China University of Petroleum (East China), Qingdao, China, July 6, 2019.

Multiscale Gas Flow in Shale Gas Reservoirs: presented at China University of Petroleum (East China), Qingdao, China, July 4, 2019.

Digital Realization of Shale Samples: presented at China University of Petroleum (East China), Qingdao, China, July 2, 2019.

Relating Rock and Fluid Attributes to Fluid Flow and Production in Shale: presented to Hildebrand Department of Petroleum and Geosystems Engineering, presented at The University of Texas at Austin, April 8, 2019.

Fluid Flow in Composite Nanoporous Systems: Shale Gas Reservoirs: presented to Gordon Research Conference, presented at Flow and Transport in Permeable Media Across Scales: From Pore-Scale Physics to Geologic-Scale Processes, Newry, Maine, July 8-13, 2018.

Reserve Estimation and Fluid Flow in Shale Reservoirs: presented to Statoil, Austin, Texas, USA, April 27, 2016.

Nanophysical Aspects of Geological Formations: presented to Sam Houston State University, presented at Department of Physics Colloquium, Huntsville, Texas, January 28, 2016.

Gas and liquid flow in shale: presented to American Association of Petroleum Geologists (AAPG), Austin, TX, USA, November 3-4, 2015.

Nanophysical Aspects of Hydrocarbon Reservoirs: presented to United States Geological Survey (USGS), Denver, Colorado, August 21, 2015.

Reserve Estimation and Fluid Flow in Shale Reservoirs: presented to Husky Energy, Calgary, Alberta, Canada, August 13, 2015.

Interaction of polymer coated nanoparticle and an brine-oil interface: presented to BP, Houston, Texas, November 19, 2014.

Interaction of polymer coated nanoparticles and minerals at high ionic strength medium: presented to Schlumberger Doll Research Center, Cambridge, Massachusetts, June 4, 2014.

Reserve estimation and fluid flow in shale gas system: presented to the Department of Petroleum and Geosystem Engineering, The University of Texas at Austin, January 27, 2014.

Advances and challenges of shale gas production: presented to Desert Research Institute, Las Vegas, Nevada, December 18, 2013.

Deposition of nanoparticles on mineral grains: presented to Shell International, Inc., Houston, Texas, November 20, 2013.

Nanoparticle retention at the water-oil interfaces: presented to Halliburton Research Center, Houston, Texas, November 20, 2013.

Nanoscience in geosciences: presented to Massachusetts Institute of Technology, Cambridge, Massachusetts, May 31, 2013.

Nanoparticle interaction with fluid interfaces in porous media: presented to Schlumberger Doll Research Center, Cambridge, Massachusetts, May 29, 2013.

Modeling gas evolution in shale canisters: presented to ConocoPhillips, Houston, Texas, September 2012.

AFM metrology for the transport at nanoscale: presented to Schlumberger Doll Research Center, Cambridge, Massachusetts, May 2012.

Gas in place and lost gas in shales: presented to ConocoPhillips, Houston, Texas, October 2011.

Application of atomic force microscopy (AFM) in reservoir characterization: presented to the Jackson School of Geosciences, The University of Texas at Austin, September 2011.

Micromodels studies of transport at nanoscale: presented to Schlumberger Doll Research Center, Cambridge, Massachusetts, June 2011.

Nanoscale to macroscale modeling of transport in porous media (particle suspension): presented to Shell International, Inc., Houston, Texas, October 14, 2010.

Mathematical modeling of transport at nanoscale: presented to Schlumberger Doll Research Center, Cambridge, Massachusetts, June 2010.

Unconventional gas transport in shale gas: presented to ConocoPhillips, Houston, Texas, March 31, 2010.

Pore-to-Reservoir up-scaling of transport processes: applicable to sand reservoirs, shale systems, and naturally fractured media: presented at Bureau of Economic Geology Symposium, The University of Texas at Austin, Austin, Texas, February 6, 2009.

Transport processes in shale gas media: presented to Exxon-Mobil, Upstream Research Company, Houston, Texas, December 11, 2008.

## Presentations

Integrated multiscale modeling of fluid flow in shale: molecular-to-core scales: presented at 7th International Conference on Computational Methods, Berkeley, CA, USA, August 1-4, 2016.

Langmuir Slip-Langmuir Sorption Stochastic Permeability Model of Shale: presented at 2016 Unconventional Resources Technology Conference (URTeC), San Antonio, Texas, USA, August 1-3, 2016.

Viscoelasticity of multiphase fluids: Future directions: presented at EGU2016, Vienna, Austria, April 17-22, 2016.

Modeling of coupled surface and diffusion forces for the transport and retention of nanoparticles

in porous media: presented to the Canadian Applied and Industrial Mathematics Society (CAIMS) and SIAM, presented at Applied Mathematics, Modeling and Computational Science (AMMCS) Congress, Waterloo, ON, Canada, June 7-12, 2015.

Chromatographic separation of produced gas in shale gas reservoirs: presented to Ontario Ministry of the Environment, presented at The 6th Multidimensional Chromatography Workshop, Toronto, ON, Canada, January 6-7, 2015.

Nanoparticle interaction with fluid interfaces in porous media: presented at Schlumberger Doll Research Center, Cambridge, Massachusetts, May 2013.

Nanoscience in Geosciences: presented at Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts, May 2013.

Dual-continuum modeling of shale and tight gas reservoirs: presented at SPE Annual Technical Conference and Exhibition, San Antonio, TX, USA, San Antonio, Texas, October 2012.

Modeling gas evolution in shale canisters: presented at ConocoPhillips, Houston, Texas, September 2012.

AFM metrology for the transport at nanoscale, , May 2012: presented at Schlumberger Doll Research Center, Cambridge, Massachusetts, May 2012.

Application of atomic force microscopy (AFM) in nanogeosciences: presented at Hydro Brown Bag Seminar, Department of Geological Sciences, The University of Texas at Austin, Austin, Texas, November 5, 2010.

Nanoscale to macroscale modeling of transport in porous media (particle suspension): presented at Shell International Inc., Houston, Texas, October 14, 2010.

Unconventional gas transport in shale gas: presented at ConocoPhillips, Houston, Texas, March 31, 2010.

Nano- and micro-particle transport in porous media II: modeling: presented at the Advanced Energy Consortium (AEC) Workshop, Houston, Texas, March 30, 2010.

Nano- and micro-particle transport in porous media I: experiment: presented at the Advanced Energy Consortium (AEC) Workshop, Houston, Texas, March 29, 2010.

Apparent permeability in mudrock systems: presented at Mudrock Systems Research Laboratory (MSRL) start-up meeting, Bureau of Economic Geology, Austin, Texas, January 12-13, 2010.

Transport processes in shale gas media: presented at the Upstream Research Company, Exxon-Mobil, Houston, Texas, December 11, 2009.

Modeling of coupled surface & drag forces for the transport & retention of microparticles in porous media: presented at Multiphysics Conference, Lille, France, December 9-11, 2009.

Dispersion of passive and self-propelled micro- and nanoparticles in porous media saturated with single and multiphase fluids: presented at Advanced Energy Consortium (AEC) mid-year meeting, J. J. Pickle Research Facilities, Austin, Texas, September 2-3, 2009.

Diffusive advective gas flow modeling in random nanoporous systems (RNPS) at different Knudsen regimes: presented at 17th International Conference on Composites or Nano Engineering, Honolulu, Hawaii, July 2009.

Modeling gas flow through nanopores of mudrocks: presented at the 2009 AAPG/SEPM Annual Meeting, Denver, Colorado, June 7-10 2009.

Mathematical modeling of particles dispersion in porous media: presented at Nanotech Conference and Expo, Houston, Texas, May 5, 2009.

Application of nanotechnology in geosciences (experimental and modeling approaches):



presented at the Department of Geological Sciences, Jackson School of Geosciences, The University of Texas at Austin, Austin, Texas, April 24, 2009.

Sequestration in geological formations: pore-level to reservoir-scale up-scaling: presented at 7th North American Workshop on Applications of Physics of Porous Media, Puerto Vallarta, Mexico, November 2-6, 2007.

Carbon dioxide flooding of depleted oil and gas pools: presented at Greenhouse Gases Mitigation and Utilization Conference, Kingston, Ontario, July 2007.

Nanoscale gas flow in shale sediments: presented at NanoForum Canada 2007, Canada Nanoscience and Nanotechnology Forum, University of Waterloo, Waterloo, Ontario, June 18-20 2007.

New generation of micromodels and image analysis for the study of dispersion in porous media: presented at Canadian International Petroleum Conference, Calgary, Alberta, June 2007.

Dispersion and adhesion of finite-sized particles in fibrous porous beds used as blood filters: presented at 17th Canadian Symposium on Fluid Dynamics CAIMS-MITACS 2006 Joint Annual Conference, York University, Toronto, Ontario, June 16-20 2006.

Experiments on bubble expansion in porous media: presented at 52nd Canadian Chemical Engineering Conference (CSCHE 2002), Vancouver, British Columbia, October 2002.

Suspension filtration in porous media: presented at 52nd Canadian Chemical Engineering Conference (CSCHE 2002), Vancouver, British Columbia, October 2002.

Network modeling of gas bubble break-up in heavy oil: 51st Canadian Chemical Engineering Conference (CSCHE 2001, Halifax, Nova Scotia, October 13-17, 2001.

## Activities of a Professional Nature

### Professional Societies

Adhesion Society

American Association of Petroleum Geologists

American Geophysical Union

Canadian Institute of Mining, Metallurgy, and Petroleum

International Society for Porous Media (Interpore)

Society of Core Analysts

Society of Petroleum Engineers

## Publications

### Peer Reviewed Journal Articles

Rabbani, A., Babaei, M., and Javadpour, F., 2020, A triple pore network model (T-PNM) for gas flow simulation in fractured, micro-porous and meso-porous media: *Transport in Porous Media*, v. 132, no. 3, p. 707-740, <http://doi.org/10.1007/s11242-020-01409-w>.

Sheng, G., Su, Y., Javadpour, F., Wang, W., Zhan, S., Liu, J., and Zhong, Z., 2020, New slip coefficient model considering adsorbed gas diffusion in shale gas reservoirs: *Energy and Fuels*, v. 34, no. 10, p. 12078-12087, <http://doi.org/10.1021/acs.energyfuels.0c01689>.

Sheng, G., Zhao, H., Su, Y., Javadpour, F., Wang, C., Zhou, Y., Liu, J., and Wang, H., 2020, An analytical model to couple gas storage and transport capacity in organic matter with noncircular pores: *Fuel*, v. 268, no. 117288, 13 p., <http://doi.org/10.1016/j.fuel.2020.117288>.

Tahmasebi, P., Javadpour, F., and Enayati, S. F., 2020, Digital rock techniques to study shale permeability: a mini-review: *Energy and Fuels*, v. 34, no. 12, p. 15672-15685,

<http://doi.org/10.1021/acs.energyfuels.0c03397>.

Wang, S., Feng, Q., Javadpour, F., Zha, M., and Cui, R., 2020, Multiscale modeling of gas transport in shale matrix: an integrated study of molecular dynamics and rigid-pore-network model: *Society of Petroleum Engineers Journal*, v. 25, no. 3, p. 1416-1442, <http://doi.org/10.2118/187286-PA>.

Zhang, T., Javadpour, F., Li, X., Wu, K., Li, J., and Ying, Y., 2020, Mesoscopic method to study water flow in nanochannels with different wettability: *Physical Review E*, v. 102, no. 013306, 17 p., <http://doi.org/10.1103/PhysRevE.102.013306>.

Zhang, T., Javadpour, F., Yin, Y., and Li, X., 2020, Upscaling water flow in composite nanoporous shale matrix using lattice Boltzmann method: *Water Resources Research*, v. 56, no. e2019WR026007, 19 p., <http://doi.org/10.1029/2019WR026007>.

Zuo, H., Javadpour, F., Deng, S., and Li, H., 2020, Liquid slippage on rough hydrophobic surfaces with and without entrapped bubbles: *Physics of Fluids*, v. 32, no. 082003, 30 p., <http://doi.org/10.1063/5.0015193>.

Zuo, H., Javadpour, F., Deng, S., Jiang, X., Li, Z., and Li, H., 2020, Reassessing water slippage in hydrophobic nanostructures: *The Journal of Chemical Physics*, v. 153, no. 19, article no. 191101, 8 p., <http://doi.org/10.1063/5.0030758>.

Sheng, G., Javadpour, F., and Su, Y., 2019, Dynamic porosity and apparent permeability in porous organic matter of shale gas reservoirs: *Fuel*, v. 251, p. 341-351, <http://doi.org/10.1016/j.fuel.2019.04.044>.

Sheng, G., Javadpour, F., Su, Y., Liu, J., Li, K., and Wang, W., 2019, A semianalytic solution for temporal pressure and production rate in a shale reservoir with non-uniform distribution of induced fractures: *SPE Journal*, v. 24, no. 4, p. 1856-1883, <http://doi.org/10.2118/195576-PA>.

Wang, S., Feng, Q., Javadpour, F., Hu, Q., and Wu, K., 2019, Competitive adsorption of methane and ethane in montmorillonite nanopores of shale at supercritical conditions: a grand canonical Monte Carlo simulation study: *Chemical Engineering Journal*, v. 355, p. 76-90, <http://doi.org/10.1016/j.cej.2018.08.067>.

Afsharpoor, A., and Javadpour, F., 2018, Pore connectivity between organic and inorganic matter in shale: network modeling of mercury capillary pressure: *Transport in Porous Media*, v. 125, no. 3, p. 503-519, <http://doi.org/10.1007/s11242-018-1132-0>.

Hosseini, A., and Javadpour, F., 2018, Determination of nanoparticle macrotransport coefficients from pore scale processes: *Transport in Porous Media*, v. 125, no. 2, p. 377-394, <http://doi.org/10.1007/s11242-018-1123-1>.

Naraghi, M. E., Javadpour, F., and Ko, L., 2018, An object-based shale permeability model: non-Darcy gas flow, sorption, and surface diffusion effects: *Transport in Porous Media*, v. 125, p. 23-39, <http://doi.org/10.1007/s11242-017-0992-z>.

Sheng, G., Javadpour, F., and Su, Y., 2018, Effect of microscale compressibility on apparent porosity and permeability in shale gas reservoirs: *International Journal of Heat and Mass Transfer*, v. 120, p. 56-65, <http://doi.org/10.1016/j.ijheatmasstransfer.2017.12.014>.

Tahmasebi, P., Javadpour, F., and Frebourg, G., 2018, Geologic modeling of Eagle Ford facies continuity based on outcrop images and depositional processes: *SPE Journal*, v. 23, no. 4, p. 1359-1371, <http://doi.org/10.2118/189975-PA>.

Wang, S., Feng, Q., Zha, M., Javadpour, F., and Hu, Q., 2018, Supercritical methane diffusion in shale nanopores: effects of pressure, mineral types, and moisture content: *Energy & Fuels*, v. 32, no. 1, p. 169-180, <http://doi.org/10.1021/acs.energyfuels.7b02892>.

Xu, S., Feng, Q., Wang, S., Javadpour, F., and Li, Y., 2018, Optimization of multistage fractured horizontal wells in tight oil based on embedded discrete fracture model: *Computers and*

Chemical Engineering, v. 117, p. 291-308, <http://doi.org/10.1016/j.compchemeng.2018.06.015>.

Afsharpoor, A., Javadpour, F., Wu, J., Ko, L.T., and Liang, Q., 2017, Network modeling of liquid flow in Yanchang shale: Interpretation, v. 5, no. 2, p. SF99-SF107, <http://doi.org/10.1190/INT-2016-0100.1>.

Ghanbarian, B., and Javadpour, F., 2017, Upscaling pore pressure-dependent gas permeability in shales: Journal of Geophysical Research: Solid Earth, v. 122, p. 2541-2552, <http://doi.org/10.1002/2016JB013846>.

Mehrabi, M., Javadpour, F., and Sepehrnoori, K., 2017, Analytical analysis of gas diffusion into non-circular pores of shale organic matter: Journal of Fluid Mechanics, v. 819, p. 656-677, <http://doi.org/10.1017/jfm.2017.180>.

Sheng, G., Su, Y., Wang, W., Javadpour, F., and Tang, M., 2017, Application of fractal geometry in evaluation of effective stimulated reservoir volume in shale gas reservoirs: Fractals, v. 25, no. 4, p. 1740007-1 to 1740007-13, <http://doi.org/10.1142/S0218348X17400072>.

Singh, H., and Javadpour, F., 2017, Retention of nanoparticles: from laboratory cores to outcrop scales: Geofluids, v. 2017, 16 p., <http://doi.org/10.1155/2017/8730749>, Article ID 8730749.

Tahmasebi, P., Javadpour, F., and Sahimi, M., 2017, Data mining and machine learning for identifying sweet spots in shale reservoirs: Expert Systems with Applications, v. 88, p. 435-447, <http://doi.org/10.1016/j.eswa.2017.07.015>.

Afsharpoor, A., and Javadpour, F., 2016, Liquid slip flow in a network of shale noncircular nanopores: Fuel, v. 180, p. 580-590, <http://doi.org/10.1016/j.fuel.2016.04.078>.

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