

# Publications

## Chemical and Petroleum Engineering

Year 2020

### Journals

1. S. Rouf, Y.E. Greish and **S. Al-Zuhair** (2020) Immobilization of Formate Dehydrogenase in Metal Organic Frameworks for Enhanced Conversion of Carbon Dioxide to Formate. *Chemosphere (Elsevier)* – In Press
2. M.S. Kuttiyathil, M.M. Mohamed, **S. Al-Zuhair** (2020) Using Microalgae for Remediation of Crude Petroleum Oil-Water Emulsions. *Biotechnology Progress (Wiley)* – In Press
3. H. Najini, M. Nour, **S. Al-Zuhair**; F. Ghaith (2020) Techno-Economic Review Analysis of Green Building Codes in United Arab Emirates. *Sustainability (MDPI)* 12:1-22, 877
4. B. Lia, M. Akram, **S. Al-Zuhair**, E. Elnajjar, M.T.Munir (2020) Subcritical water extraction of phenolics, antioxidants and dietary fibres from waste date pits. *Journal of Environmental Chemical Engineering (Elsevier)* 8:104490
5. E. Elnajjar, **S. Al-Zuhair**, S. Hasan, S. Almardeai, SAB Al Omari, A. Hilal-Alnaqbi (2020) Morphology Characterization and Chemical Composition of United Arab Emirates Date Seeds and Their Potential for Energy Production. *Energy (Elsevier)* 213, 118810
6. A. Khaleel, S. Jobe, M. Ahmed, **S. Al-Zuhair**, S. Tariq (2020) Enhanced selectivity of syngas in partial oxidation of methane: a new route for promising Ni-alumina catalysts derived from Ni/AlOOH with modified Ni dispersion. *International Journal of Energy Research (Wiley)* 44:12081–12099.
7. E. Galiwango, M. Ismail, M.S. Ahmad, **S. Al-Zuhair** (2020) Effect of Thermo-responsive Switchable Solvents on Microalgae Cells' Disruption and Non-isothermal Combustion Kinetics. *Biomass Conversion and Biorefinery (Springer)* – In press
8. F. Khanum, A. Giwa, M. Nour, **S. Al-Zuhair**, H. Taher (2020) Improving the Economic Feasibility of Biodiesel Production from Microalgal Biomass via High-value Products Co-production *International Journal of Energy Research (Wiley)* 44: 11453-11472
9. M. Al Ahmad, S. Raji, F. Mustafa, T.A. Rizvi, **S. Al-Zuhair** (2020) Simultaneous and Rapid Quantification of Microalga Biomolecule Content using Electrochemical Impedance Spectroscopy. *Biotechnology Progress (Wiley)* – In press
10. M. Ismail, **S. Al-Zuhair** (2020) Thermo-responsive switchable solvents for simultaneous microalgae cell disruption, oil extraction-reaction, and product separation for biodiesel production. *Biocatalysis and Agricultural Biotechnology (Elsevier)* 26, 101667
11. M. AbuJayyab, **S. Al-Zuhair** (2020) Use of microalgae for simultaneous industrial wastewater treatment and biodiesel production. *International Journal of Environmental Research (Springer)* 14(3), 311-322
12. H. Taher, A. Giwa, H. Abusabiekeh, **S. Al-Zuhair** (2020). Biodiesel production from *Nannochloropsis gaditana* using supercritical CO<sub>2</sub> for lipid extraction and immobilized lipase transesterification: Economic and environmental impact assessments. *Fuel Processing Technology (Elsevier)* 198 : 106249
13. A.Y. Zekri, L. Yang, G. Alusta, and **Mamdouh Ghannam**, "Sequential injection of carbonated water: A possible process for coupling CO<sub>2</sub> enhanced oil recovery and storage", *International Journal of Recent Technology and Engineering* 9 (3), 2277-3878 (2020).
14. Mohamed A. Al-Bayywomi, Mohamed Y. E. Selim, **Mamdouh T. Ghannam**, "Another dimension to the engineering code of ethics", *International Journal of Multidisciplinary and Current Educational Research* 2 (4), 95-103 (2020).

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15. A.Y. Zekri, M. J. Khalifi, H. Al-Attar, and **Mamdouh Ghannam**, "Modification of gulf seawater for possible use in improving oil recovery of carbonate formation: Mechanism investigation", *International Journal of Advanced Science and Technology* 29 (3), 12960 – 12976 (2020).
16. Mohamed Y E Selim, **Mamdouh T Ghannam**, Hosam E Saleh, Moudi T Ali Alameri, Mariam G Zaghoul, Aya Mansour, "Behaviour of water-waste cooking oil biodiesel emulsion for diesel engine performance, engine roughness and exhaust emissions", *International Journal of Engineering Research & Technology* 9 (7), 1282-1288 (2020).
17. **Mamdouh T. Ghannam**, Mohamed Y.E. Selim, Abdulrazag Y. Zekri, and Nabil Esmail, "Thixotropic assessment of some enhanced oil recovery used polymers", *International Journal of Engineering Research & Technology* 9 (7), 1683-1693 (2020).
18. Bayu, F., **Shaik, M.A.\*** and Ramteke, M. "Short-term scheduling of crude oil refinery operation with desalting as a separate task", *Asia-Pacific Journal of Chemical Engineering*, 2020, e2539.  
<https://doi.org/10.1002/apj.2539>
19. **E. Mahmoud**, Recent advances in the design of metal–organic frameworks for methane storage and delivery, *Journal of Porous Materials*, (2020) 1-18.
20. **E. Mahmoud**, Quantitative Structure–Property Relationships from Experiments for CH<sub>4</sub> Storage and Delivery by Metal–Organic Frameworks, *Crystals*, 10 (2020) 700.
21. **E. Mahmoud**, Mitigating Global Methane Emissions Using Metal–Organic Framework Adsorbents, *Applied Sciences*, 10 (2020) 7733.
22. **E. Mahmoud**, Evolution of the Design of CH<sub>4</sub> Adsorbents, *Surfaces*, 3 (2020) 433.
23. G.D. Saratale, R. Bhosale, A Pugazendhi, **E. Mahmoud**, R. Sirohi, SK Bhatia, AE Atabani, V. Mulone, J. Yoon, H.S. Shin, G. Kumar, A review on valorization of spent coffee grounds (SCG) towards biopolymers and biocatalysts production, *Bioresource technology*, 314 (2020) 123800.
24. Ayyash, M., Stathopoulos, C., **Abu-Jdayil**, B., Esposito, G., Baig, M., Turner, M. S., ... & Osaili, T. (2020). Exopolysaccharide produced by potential probiotic *Enterococcus faecium* MS79: Characterization, bioactivities and rheological properties influenced by salt and pH. *LWT*, 131, 109741.
25. Barkhad, M. S., **Abu-Jdayil**, B., Iqbal, M. Z., & Mourad, A. H. I. (2020). Thermal insulation using biodegradable poly (lactic acid)/date pit composites. *Construction and Building Materials*, 261, 120533.
26. Abuoudah, C. K., Greish, Y. E., **Abu-Jdayil**, B., El-said, E. M., & Iqbal, M. Z. (2020). Graphene/polypropylene nanocomposites with improved thermal and mechanical properties. *Journal of Applied Polymer Science*, 50024.
27. Ayyash, M., **Abu-Jdayil**, B., Itsaranuwat, P., Galiwango, E., Tamiello-Rosa, C., Abdullah, H., ... & Hamed, F. (2020). Characterization, bioactivities, and rheological properties of exopolysaccharide produced by novel probiotic *Lactobacillus plantarum* C70 isolated from camel milk. *International journal of biological macromolecules*, 144, 938-946.
28. Ayyash, M., **Abu-Jdayil**, B., Olaimat, A., Esposito, G., Itsaranuwat, P., Osaili, T., ... & Liu, S. Q. (2020). Physicochemical, bioactive and rheological properties of an exopolysaccharide produced by a probiotic *Pediococcus pentosaceus* M41. *Carbohydrate polymers*, 229, 115462.
29. Ayyash, M., **Abu-Jdayil**, B., Itsaranuwat, P., Almazrouei, N., Galiwango, E., Esposito, G., ... & Najjar, Z. (2020). Exopolysaccharide produced by the potential probiotic *Lactococcus garvieae* C47: Structural characteristics, rheological properties, bioactivities and impact on fermented camel milk. *Food Chemistry*, 333, 127418.
30. Al-Azzawi, M., Mjalli, F. S., Al-Wahaibi, T., Al-Hashmi, A., & **Abu-Jdayil**, B. (2020). Flow patterns analysis of conventional versus eutectic liquid solvent in different circular small channel diameters. *Chemical Papers*, 1-10.

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31. Al-Azzawi, M., Husain, A., Mjalli, F. S., Al-Wahaibi, T., Al-Hashmi, A., & **Abu-Jdayil, B.** (2020). Hydrodynamic Investigation on Deep Desulfurization of Liquid Fuel at the Microscale. *Chemical Engineering & Technology*, 43(10), 1951-1958.
32. Barkhad, M. S., **Abu-Jdayil, B.**, Mourad, A. H. I., & Iqbal, M. Z. (2020). Thermal Insulation and Mechanical Properties of Polylactic Acid (PLA) at Different Processing Conditions. *Polymers*, 12(9), 2091.
33. Mourad, A. H. I., **Abu-Jdayil, B.**, & Hassan, M. (2020). Mechanical behavior of Emirati red shale fillers/unsaturated polyester composite. *SN Applied Sciences*, 2(3), 1-9.
34. Ilyas Khurshid, Emad Walid AlShalabi, **Hazim Al-Attar**, Ahmed Khalifa AL-Neaimi: "Analysis of formation damage and fracture choking in hydraulically induced fractured reservoirs due to asphaltene deposition", *Journal of Petroleum Exploration and Production Technology* <https://doi.org/10.1007/s13202-020-00910-8>, May 2020.
35. **Hazim Al-Attar**, Hala Alshadafan, Mariam Al Kaabi, Aysha Al Hassani, Shatha Al Mheiri: "Integrated optimum design of hydraulic fracturing for tight hydrocarbon-bearing reservoirs", *Journal of Petroleum Exploration and Production Technology* <https://doi.org/10.1007/s13202-020-00990-6>, August 2020.
36. Abdulrazag Zekri, Mohammad Khalifi, **Hazim Al-Attar**, and Mamdouh Ghannam: "Modification of Gulf Seawater for Possible Use in Improving Oil Recovery of Carbonate Formation: Mechanism Investigation", *International Journal of Advanced Science and Technology* Vol. 29, No. 03, (2020), pp. 12960 - 12976 12960 ISSN: 2005-4238 IJAST Copyright © 2020 SERSC.
37. **Nayef Ghasem**, Modeling and Simulation of the Simultaneous Absorption/Stripping of CO<sub>2</sub> with Potassium Glycinate Solution in Membrane Contactor, *Membranes* 10 (4), 72, 2020
38. **Nayef Ghasem**, Modeling and simulation of the hollow fiber bore size on the CO<sub>2</sub> absorption in membrane contactor. *Chemical Product and Process Modeling* 1, 2020
39. Carmen Abuoudah, Yaser Greish, Basim Abu-Jdayil, Ehab El-said, **Muhammad Iqbal** (2020) "Graphene/polypropylene nanocomposites with improved thermal and mechanical properties" *Journal of Applied Polymer Science*, Issue 50024.
40. Mohamed Barkhed, Basim Abu-Jdayil, Abdel-Hamid Mourad, **Muhammad Iqbal** (2020) "Thermal Insulation and Mechanical Properties of Polylactic acid (PLA) at Different Processing Conditions" *Polymers*, Vol. 12, Issue 9.
41. Mohamed Barkhed, Basim Abu-Jdayil, **Muhammad Iqbal**, Abdel-Hamid Mourad (2020) "Thermal insulation using biodegradable poly (lactic acid)/date pit composites" *Construction and Building Materials*, Vol. 261.
42. Sabeen Fatima, S. Irfan Ali, **Muhammad Iqbal**, Syed Rizwan (2020) "Congo Red Dye Degradation by Graphene nanoplatelets/doped Bismuth Ferrite Nanoparticle Hybrid Catalysts under Dark and Light Conditions" *Catalysts*, Vol. 10, Issue 4.
43. Bayu, F., Panda, D., **Shaik, M.A.** and Ramteke, M.\* "Scheduling of Gasoline Blending and Distribution using Graphical Genetic Algorithm", *Computers & Chemical Engineering*, 2020, 133, 106636. <https://doi.org/10.1016/j.compchemeng.2019.106636>
44. Ahmed Abuibaid, **Muhammad Iqbal** (2020) "Thermally reduced graphene/polyethylene nanocomposites: effects of graphene on isothermal and nonisothermal crystallization of polyethylene" *Heliyon*, Vol. 6, Issue 3.
45. Qandeel Noor, S. Afsheen Zahra, Martha Serna, Carmen Abuoudah, **Muhammad Iqbal**, Deji Akinwande, Syed Rizwan (2020) "Silicon carbide-assisted co-existence of magnetic phases in well-optimized Ti<sub>3</sub>SiC<sub>2</sub>-etched MXene" *Ceramic International*, Vol 46, Issue 17.
46. **Zekri, A. Y.**, Yang, L., Alusta, G., Ghannam, M., " Sequential Injection of Carbonated Water: A Possible Process for Coupling CO<sub>2</sub> Enhanced Oil Recovery and Storage," *International Journal of Recent Technology and Engineering*, Volume-9, Issue-3, September 2020 .
47. **Zekri, A. Y.** Khalifi, M. J., Attar, H., Ghannam, M., "Modification of Gulf Seawater for Possible Use in Improving Oil Recovery of Carbonate Formation: Mechanism Investigation," *International Journal of Advanced Science and Technology*, Vol. 29, No. 03, pp. 12960 – 12976 (2020).

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48. Ghannama, M.,T., Selimb, M. Y., **Zekri, A.,Y.,** Esmail, N.,” Thixotropic Assessment of Some Enhanced Oil Recovery used Polymers,” International Journal of Engineering Research & Technology, Vol. 9 Issue 07, July-2020.
49. E Svinterikos, I Zuburtikudis, **M Al-Marzouqi,** “Fabricating carbon nanofibers from a lignin/r-PET blend: the synergy of mass ratio with the average fiber diameter”, Applied Nanoscience, 2020 10 (4), 1331-1343.
50. E Svinterikos, I Zuburtikudis, **M Al-Marzouqi,** “Electrospun Lignin-Derived Carbon Micro-and Nanofibers: A Review on Precursors, Properties, and Applications”, ACS Sustainable Chemistry & Engineering, 2020 8 (37), 13868-1389.
51. ZU Rehman, N Ghasem, **M Al-Marzouqi,** N Abdullatif, “Enhancement of carbon dioxide absorption using na hollow fiber membrane contactor”, Chinese Journal of Chemical Engineering, 2020.
52. AF Mohammad, AAHI Mourad, J Mustafa, AH Al-Marzouqi, MH El-Naas, **M Al-Marzouqi,** F Alnaimat, M Su AlMusharfy and T Firmansyah, “Computational fluid dynamics simulation of an Inert Particles Spouted Bed React system”, International Journal of Chemical Reactor Engineering, 2020; 20200025.
53. **M. Altarawneh,** A. Saeed, K. Siddique, S. Jansson, B.Z. Dlugogorski, Formation of polybrominated dibenzofurans (PBDFs) and polybrominated diphenyl ethers (PBDEs) from oxidation of brominated flame retardants (BFRs), Journal of Hazardous Materials, 400 (2020).
54. N. Zeinali, I. Oluwoye, **M. Altarawneh,** B.Z. Dlugogorski, Kinetics of Photo-Oxidation of Oxazole and its Substituents by Singlet Oxygen, Scientific Reports, 10 (2020).
55. [M.H. Almatarneh, A. Alnajjarah, **M. Altarawneh,** Y. Zhao, M.A. Halim, Computational mechanistic study of the unimolecular dissociation of ethyl hydroperoxide and its bimolecular reactions with atmospheric species, Scientific Reports, 10 (2020).
56. A. Shiroudi, K. Hirao, K. Yoshizawa, **M. Altarawneh,** M.A. Abdel-Rahman, A.B. El-Meligy, A.M. El-Nahas, A computational study on the kinetics of pyrolysis of isopropyl propionate as a biodiesel model: DFT and ab initio investigation, Fuel, 281 (2020).
57. **M. Altarawneh,** D. Waters, B.M. Goh, Z.T. Jiang, M. El-Harbawi, C.Y. Yin, Adsorptive interactions between metaldehyde and sulfonic functional group in ion exchange resin, Journal of Molecular Liquids, 313 (2020).
58. **M. Altarawneh,** O.H. Ahmed, M. Al-Harashsheh, Z.T. Jiang, N.M. Huang, H.N. Lim, B.Z. Dlugogorski, Co-pyrolysis of polyethylene with products from thermal decomposition of brominated flame retardants, Chemosphere, 254 (2020).
59. I. Oluwoye, M. Altarawneh, J. Gore, B.Z. Dlugogorski, Products of incomplete combustion from biomass reburning, Fuel, 274 (2020) In Press, 10.1016/j.fuel.2020.117805.
60. S.A. Saraireh, **M. Altarawneh,** M.A. Tarawneh, Adsorption and dissociation of the methanethiol (CH<sub>3</sub>SH) molecule on the Fe(100) surface, Surface and Interface Analysis, 52 (2020) 156-166.
61. A. Saeed, **M. Altarawneh,** K. Siddique, J.A. Conesa, N. Ortuño, B.Z. Dlugogorski, Photodecomposition properties of brominated flame retardants (BFRs), Ecotoxicology and Environmental Safety, 192 (2020).
62. I. Oluwoye, M. Altarawneh, J. Gore, B.Z. Dlugogorski, Burning properties of redox crystals of ammonium nitrate and saccharides, Combustion and Flame, 213 (2020) 132-139.
63. **M. Altarawneh,** I. Oluwoye, B.Z. Dlugogorski, Singlet-diradical character in large PAHs triggers spontaneous-ignition of coal, Combustion and Flame, 212 (2020) 279-281.
64. O.H. Ahmed, **M. Altarawneh,** M. Al-Harashsheh, Z.T. Jiang, B.Z. Dlugogorski, Formation of phenoxy-type Environmental Persistent Free Radicals (EPFRs) from dissociative adsorption of phenol on Cu/Fe and their partial oxides, Chemosphere, 240 (2020).
65. S. Jabeen, X. Gao, **M. Altarawneh,** J.I. Hayashi, M. Zhang, B.Z. Dlugogorski, Analytical Procedure for Proximate Analysis of Algal Biomass: Case Study for Spirulina platensis and Chlorella vulgaris, Energy and Fuels, 34 (2020) 474-482.

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66. I. Oluwoye, S. Mosallanejad, G. Soubans, **M. Altarawneh**, J. Gore, B.Z. Dlugogorski, Thermal decomposition of ammonium nitrate on rust surface: Risk of low-temperature fire, *Fire Safety Journal*, (2020).
67. H.A. Miran, **M. Altarawneh**, Z.N. Jaf, M.M. Rahman, M.H. Almatarneh, Z.T. Jiang, Influence of the variation in the hubbard parameter ( $U$ ) on activation energies of  $CeO_2$ -catalysed reactions, *Canadian Journal of Physics*, 98 (2020) 385-389.
68. Z.N. Jaf, Z.T. Jiang, H.A. Miran, **M. Altarawneh**, J.P. Veder, M. Minakshi, Z.F. Zhou, H.N. Lim, N.M. Huang, B.Z. Dlugogorski, Physico-chemical properties of CrMoN coatings - combined experimental and computational studies, *Thin Solid Films*, 693 (2020).
69. Almatarneh M.H, Alrebei S.F, **Altarawneh M**, Zhao Y, A.-S.A. -A., Computational Study of the Dissociation Reactions of Secondary Ozonide, *Atmosphere* 11 (2020) 100.
70. Z. Zeng, I. Oluwoye, **M. Altarawneh**, B.Z. Dlugogorski, Flammability of sulfur powder - An extremely hazardous chemical, *Fire Safety Journal*, In Press, <https://doi.org/10.1016/j.firesaf.2020.103088> (2020) 103088.
71. S. Saleh E.Rawadieh, **M. Altarawneh**, A.S. Altarawneh, M.A. A.Batiha, L. A.Al-Makhadmeh, A kinetic model for evolution of  $H_2$  and CO over Zr-doped ceria, *Molecular Catalysis*, 498 (2020) 111256.
72. Abdulrazag Y. Zekri, Li Yang, **Gamal Alusta\***, and Mamdouh Ghannam "Sequential Injection of Carbonated Water: A Possible Process for Coupling CO<sub>2</sub> Enhanced Oil Recovery and Storage" *International Journal of Recent Technology and Engineering (IJRTE)* ISSN: 2277-3878, Volume-9, Issue-3, September 2020.

## Conferences

1. **Shaik, M.A.\*** and Mathur, P. "Improved Scheduling Model for Pipeless Plants", accepted at 23<sup>rd</sup> Conference on Process Integration, Modelling and Optimisation for Energy Saving and Pollution Reduction, PRES'20, 17-21 Aug 2020, Xi'an, China. (could not be presented due to COVID-19)
2. **Mahmoud, E.** (2020) The Role of Entropy in the Thermodynamics of Adsorption on Metal-Organic Frameworks for Gas Storage and Delivery, UAEU Annual Research & Innovation Conference, Al Ain, United Arab Emirates.
3. **Mahmoud, E.** (2020) Water, Energy, Environment, and Health Nexus Workshop University of Louisiana at Lafayette, Lafayette LA. Presentation: Recent Advances in Produced Water Treatment. January 21, 2020.
4. Ilyas Khurshid, **Hazim Al-Attar**, Emad Walid AlShalabi: "A New Insight into Modeling of Wormhole Propagation in the Presence of Asphaltene for Carbonates", paper number **SPE-203248-MS** has been accepted for the Abu Dhabi International Petroleum Exhibition & Conference to be held from 9-12 November 2020 in Abu Dhabi, UAE.
5. **Nayef Ghasem**, CFD modeling of Polyethylene Gas Phase Fluidized Bed Reactor with Internal Chiller. The innovational online conference on innovative science, engineering, and technology, IOCISSET 2020 (3-5, June
6. Riya Labeeb, **Nayef Ghasem**, Mohamed Marzouqi, Fabrication of polymeric flat sheet membrane suitable for the removal of CO<sub>2</sub> from natural gas. UAEU Annual Research and Innovation Conference, 4 February 2020, Al Ain, UAE.
7. Narjis Awaja, **Nayef Ghasem**, Mohamed Al-Marzouqi, Modeling and experimental measurement of the solubility of CO<sub>2</sub> in water in stirred cell reactor. UAEU Annual Research and Innovation Conference, 4th February 2020, Al Ain, UAE.
8. Ahmed Khalid, Ahmed Kaddoura, **Nayef Ghasem**, Employment of nanofluids in the capture of carbon dioxide. UAEU Annual Research and Innovation Conference, 4th February 2020, Al Ain, UAE.
9. **Muhammad Iqbal**, Maissa Adi "Bio-renewable Polyester/Graphene Nanocomposites" The Annual Technical Conference for Plastic Professionals (ANTEC-2020)- The virtual Edition



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10. Fahed Albreiki, Carmen Abuoudah, Ahmed Abuibaid, **MZ Iqbal**, “Polyethylene/Graphene/Carbon Fiber Waste Hybrid Nanocomposites” The Annual Technical Conference for Plastic Professionals (ANTEC-2020)- The virtual Edition
11. Hossein Algdamsi, Ahmed Alkouh, Ammar Agnia, Ahmed Amtereg and **Gamal Alusta** “Integration of Self Organizing Map with MLFF Neural Network to Predict Oil Formation Volume Factor: North Africa Crude Oil Examples” Paper Number: SPE- 20102. The 12th International Petroleum Technology Conference (IPTC) 13–15 January 2020 Dhahran, Kingdom of Saudi Arabia.
12. Hossein Algdamsi, Ammar Agnia, Ahmed Alkouh, **Gamal Alusta** and Ahmed Amtereg “Oil-Water Relative Permeability Data for Reservoir Simulation Input Part2: Systematic Quality Assessment and Consistency Evaluation” Paper Number: SPE-20133. The 12th International Petroleum Technology Conference (IPTC) 13–15 January 2020 Dhahran, Kingdom of Saudi Arabia.
13. Hossein Algdamsi, Ammar Agnia, Ahmed Alkouh, **Gamal Alusta**, Ahmed Amtereg and Basem Kcharem “Consistent Black Oil PVT Table Modification Using the Generalized Reduced Gradient Method and Constrained Cubic Spline for Variable Bubble point Simulation” Paper Number: SPE-20278. The 12th International Petroleum Technology Conference (IPTC) 13–15 January 2020 Dhahran, Kingdom of Saudi Arabia.

### *Book Chapters*

1. **Nayef Ghasem**, Polymeric membranes for CO<sub>2</sub> separation, Advances in Carbon Capture, 311-329, 2020
2. **Nayef Ghasem**, CO<sub>2</sub> removal from natural gas, Advances in Carbon Capture, 479-501, 2020
3. **Al-Khalid T.**, Surkatti R., El-Naas M.H. (2020) Organic Contaminants in Industrial Wastewater: Prospects of Waste Management by Integrated Approaches. In: Shah M., Banerjee A. (eds) Combined Application of Physico-Chemical & Microbiological Processes for Industrial Effluent Treatment Plant. Springer, Singapore. [https://doi.org/10.1007/978-981-15-0497-6\\_10](https://doi.org/10.1007/978-981-15-0497-6_10)

### *Patents*

1. **Abu-Jdayil**, B., Mourad, A. I., & Barkhed, M. S. (2020). *U.S. Patent No. 10,655,009*. Washington, DC: U.S. Patent and Trademark Office.
2. Hittini, W., Mourad, A. I., & **Abu-Jdayil**, B. (2020). *U.S. Patent Application No. 16/293,405*.