

Imad A. Adel

Senior Petroleum Research Engineer · Chemical Enhanced Oil Recovery (EOR) in Carbonate Reservoirs · ADNOC program / Khalifa University

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Profile

Eleven years across gas and chemical EOR — HTHP coreflooding, slim-tube measurement, numerical simulation, modelling, research proposals and technical publishing — first in unconventional liquid reservoirs at Texas A&M, now leading the Surfactant EOR ADNOC Project from proposal to delivery in high-temperature, high-salinity carbonates at Khalifa University of Science and Technology. Fourteen published petroleum engineering scientific articles, four manuscripts in the pipeline (three under review, one in preparation), and six live interactive apps built around the research project — four interactive research companions that recompute the published results, simulate different inputs, and three standalone engineering apps — two calculators and an [interactive teaching companion on petroleum-fluid properties](#) (ten live three-dimensional modules with animated physics schematics).

Education

Texas A&M University — PhD Candidate in Petroleum Engineering

College Station, TX · January 2017–August 2019

- GPA: 3.75/4.00
- Assessment of Rich Gas, Carbon Dioxide, Surfactant and Foam Applications for Enhanced Oil Recovery in Unconventional Liquid Resources
- Evaluation of Different Acid Mixtures in Low-Permeability Carbonates

Texas A&M University — MS in Petroleum Engineering

June 2015 – Dec 2016

College Station, TX

- GPA: 3.75/4.00
- Thesis: A Reliable and Rapid Technique for the Laboratory Determination of the Minimum Miscibility Pressure for CO₂-Light Crude Oil Systems Using the Slim Tube Technique

Texas A&M University — BS in Petroleum Engineering

Aug 2011 – May 2015

College Station, TX

- Magna Cum Laude
- Major GPA: 3.92/4.00 · Cumulative GPA: 3.752/4.00

Research Experience

ADNOC External Project / Khalifa University of Science and Technology — Senior

Feb 2021 – present

Petroleum Research Engineer

Abu Dhabi, UAE

[ADNOC externally funded program on chemical EOR in Abu Dhabi high-temperature, high-salinity carbonate reservoirs.](#)

- Screened and ranked more than 10 surfactant classes at reservoir temperature and salinity, measuring phase behaviour, interfacial tension, wettability alteration and static and dynamic retention to identify formulations that combine ultra-low interfacial tension with low retention.
- Established retention-controlled screening criteria linking dynamic surfactant retention to incremental recovery and to the breakeven oil price, converting laboratory measurements into field screening thresholds.
- Built a discounted-cash-flow screening model calibrated to twelve screened corefloods that resolves retention into NPV, rate of return, unit technical cost and breakeven retention.
- Measured capillary desaturation curves and critical trapping numbers in mixed-to-oil-wet carbonate cores at 100 °C and 243,028 ppm TDS, applying the Forbes local-saturation correction to centrifuge data and scaling the laboratory results to field injection rates.

- Determined polymer molecular-weight and mechanical pre-shear requirements for injectivity into low- and moderate-permeability carbonates, bounding the accessible velocity window against fracture parting pressure.
- Assembled a criteria-screened synthesis of 49 viscoelastic-polymer coreflood contrasts, deriving carbonate injectivity bounds and a two-core experimental design from the screened evidence.
- Published the research in conference proceedings and scientific journals, and paired each of the four project manuscripts with an interactive project that recomputes the results from the measured data — for example the interactive [Chemical EOR · Capillary desaturation · HTHS carbonates](#) report.

Texas A&M University — Research Associate

Jan 2017 – Aug 2019

College Station, TX

[Gas, surfactant, and foam EOR in unconventional liquid reservoirs](#); acid systems in low-permeability carbonates.

- Evaluated CO₂, rich gas, surfactant, and foam as EOR agents in ultra-low-permeability reservoirs using coreflooding, numerical simulation, and X-ray computed tomography.
- Quantified hybrid multi-cycle recovery combining gas injection with surfactant-assisted spontaneous imbibition, and developed scaling groups that reproduce capillary pressure profiles at field scale.
- Measured the effect of ethane, propane, and CO₂ content on minimum miscibility pressure in rich gas-oil systems by the slim tube technique, and improved the precision of the CO₂-light crude MMP determination.
- Developed core- and field-scale simulation models for gas and surfactant huff-n-puff, and quantified surfactant effects on wettability, interfacial tension, and recovery factor.
- Compared acid mixtures for stimulation of low-permeability carbonates.

Texas A&M University — Teaching Assistant

Sept 2013 – Dec 2018

College Station, TX

- PETE 401 and PETE 402 — reservoir simulation and senior design (Spring 2016 – Fall 2018)
- FREN 102 and FREN 201 — intermediate French (Fall 2013 – Spring 2015)

Texas A&M University — Undergraduate Summer Research Grant

Summer 2014

College Station, TX

- Analysed production and completion data from 2,760 producing Barnett Shale wells operated by Chesapeake; the resulting completion recommendations reduced completion cost by 20 percent.

Research Metrics

Google Scholar: 493 citations · h-index 11 · i10-index 11 (as of August 2026)

Scopus: Author ID 57190069329 · Field-Weighted Citation Impact (FWCI) 6.39

Publications

Journal Articles — Pending Publication

A Retention-Controlled Screening Framework for Chemical EOR in High-Temperature, High-Salinity Carbonate Reservoirs 2026

Manuscript submitted to Petroleum Exploration and Development (KeAi Publishing).

Critical Trapping Numbers and Capillary Desaturation in Mixed-to-Oil-Wet Carbonates under High-Temperature, High-Salinity Surfactant Flooding 2026

[10.2139/ssrn.6901958](https://doi.org/10.2139/ssrn.6901958) Manuscript under review at Geoenergy Science and Engineering (Elsevier).

Techno-Economic Screening of Surfactant Flooding in High-Temperature, High-Salinity Carbonates under Retention Uncertainty 2026

Manuscript under review at Petroleum Research (KeAi Publishing).

Viscoelastic Polymer Flooding and Residual-Oil Desaturation: A Criteria-Screened Evidence Synthesis, Carbonate Injectivity Bounds, and Experimental Design 2026

Manuscript in preparation for Petroleum Science (KeAi Publishing).

Published – Journal Articles and Conference Proceedings

- Optimized Guerbet Alkoxy Carboxylate Surfactant Formulations for EOR in Carbonates Under Harsh Conditions** 2025
[10.2118/225503-MS](#) SPE Europe Energy Conference and Exhibition.
- A Look Ahead to the Future of Surfactant Flooding EOR in Carbonate Reservoirs under Harsh Conditions of High Temperature and High Salinity** 2023
[10.2118/214154-MS](#) SPE Gas & Oil Technology Showcase and Conference, Dubai, UAE.
- Numerical Investigation of Hybrid Smart Water and Foam Injections in Carbonate Reservoirs** 2023
[10.2118/212663-MS](#) SPE Reservoir Characterisation and Simulation Conference and Exhibition, Abu Dhabi, UAE.
- Numerical Investigation of Hybrid Carbonated Smart Water Injection (CSWI) in Carbonate Cores** 2023
[10.2118/214163-MS](#) SPE Gas & Oil Technology Showcase and Conference, Dubai, UAE.
- Surfactant-Assisted Spontaneous Imbibition to Improve Oil Recovery on the Eagle Ford and Wolfcamp Shale Oil Reservoir: Laboratory to Field Analysis** 2019
[10.1021/acs.energyfuels.9b00183](#) Energy & Fuels 33 (8): 6904–6920
- Experimental and Numerical Studies of EOR for the Wolfcamp Formation by Surfactant Enriched Completion Fluids and Multi-Cycle Surfactant Injection** 2019
[10.2118/194325-MS](#) SPE Hydraulic Fracturing Technology Conference and Exhibition, The Woodlands, TX, USA.
- Numerical Investigation to Understand the Mechanisms of CO₂ EOR in Unconventional Liquid Reservoirs** 2019
[10.2118/196019-MS](#) SPE Annual Technical Conference and Exhibition, Calgary, Canada.
- Numerical Investigation of EOR Applications in Unconventional Liquid Reservoirs through Surfactant-Assisted Spontaneous Imbibition and Gas Injection Following Primary Depletion** 2019
[10.2118/196055-MS](#) SPE Annual Technical Conference and Exhibition, Calgary, Canada.
- The Impact of MMP on Recovery Factor During CO₂-EOR in Unconventional Liquid Reservoirs** 2018
[10.2118/191752-MS](#) SPE Annual Technical Conference and Exhibition, Dallas, TX, USA.
- Enhanced Oil Recovery in Unconventional Liquid Reservoir Using a Combination of CO₂ Huff-n-Puff and Surfactant-Assisted Spontaneous Imbibition** 2018
[10.2118/191502-MS](#) SPE Annual Technical Conference and Exhibition, Dallas, TX, USA.
- Upscaling Laboratory Result of Surfactant-Assisted Spontaneous Imbibition to the Field Scale through Scaling Group Analysis, Numerical Simulation, and Discrete Fracture Network Model** 2018
[10.2118/190155-MS](#) SPE Improved Oil Recovery Conference, Tulsa, OK, USA.
- Scaling for Wettability Alteration Induced by the Addition of Surfactants in Completion Fluids: Surfactant Selection for Optimum Performance** 2018
[10.15530/urtec-2018-2889308](#) SPE/AAPG/SEG Unconventional Resources Technology Conference, Houston, TX, USA.
- The Impact of Gas-Assisted Gravity Drainage on Operating Pressure in a Miscible CO₂ Flood** 2018
[10.2118/190183-MS](#) SPE Improved Oil Recovery Conference, Tulsa, OK, USA.
- Fast-Slim Tube: A Reliable and Rapid Technique for the Laboratory Determination of MMP in CO₂-Light Crude Oil Systems** 2016
[10.2118/179673-MS](#) SPE Improved Oil Recovery Conference, Tulsa, OK, USA.

Technical Skills

Laboratory: Coreflooding, slim tube MMP determination, capillary desaturation and centrifuge P_c measurement, surfactant phase behaviour and retention, interfacial tension and contact angle, spontaneous imbibition, HPLC, X-ray computed tomography

Simulation: Schlumberger Eclipse (black oil), Petrel, core- and field-scale compositional and chemical-flood modelling, discrete fracture network models, scaling-group analysis

Analysis: Python for data reduction and figure generation, techno-economic screening models, production and completion data analysis

Digital: Interactive web applications and dashboards, data visualisation, single-page report companions, client-side document tooling, deployment and domain operations

Domains: Chemical EOR in carbonates, surfactant and polymer flooding, gas and CO₂ injection, unconventional liquid reservoirs, well stimulation

Languages: English, Arabic, French

Professional Service

SPE Journal — Reviewer

Jan 2017 – present

SPE Gas Resources Symposium — Scribe

Nov 2023

Society of Petroleum Engineers, Texas A&M Chapter — Public Relations Board Co-Chair

Sept 2013 – Aug 2019

College Station, TX

- Directed five committees covering recruitment, outreach, external affairs, and fundraising.
- Organised annual networking events with SPE Young Professionals and the SPE Gulf Coast Section.
- Presented in the SPE Student Paper Contests of 2014, 2015, 2017, and 2019.

Honors and Awards

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| • SPE Student Paper Contest 2019 — 1st Place, Texas A&M University Division | • Halliburton Research Scholar (2017–2019) |
| • SPE Student Paper Contest 2019 — 2nd Place, Gulf Coast North America Regional | • Chaparral Energy Scholar (2015–2017) |
| • SPE Student Paper Contest 2017 — 1st Place, Texas A&M University Division | • Joseph A. Marek '57 Scholarship for Academic Excellence |
| • SPE Student Paper Contest 2017 — 2nd Place, Gulf Coast North America Regional | • Dr. Doug Von Gonten Scholarship for Academic Excellence |
| | • Distinguished Student Award, Texas A&M Engineering Department |

Professional Training

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| • High-Performance Liquid Chromatography (HPLC) — 40 hours | • Petrel Reservoir Engineering — 24 hours |
| • Eclipse Black Oil Reservoir Simulation — 40 hours | • Machine Learning Specialization — Stanford Online / DeepLearning.AI (Coursera) |