Journal of Chemical and Petroleum Engineering (JChPE)
Print ISSN: 2423-673X Online ISSN: 2423-6721

Dear Readers,

Welcome to the current issue of the *Journal of Chemical and Petroleum Engineering*. In an era defined by depleting conventional reserves, mounting environmental constraints, and the urgent need for process intensification, our field is being called upon to deliver solutions that are not only technically sound but also sustainable and economically viable. The manuscripts selected for this issue rise to that challenge, offering a compelling blend of experimental innovation, mechanistic insight, and practical application.

Two contributions stand out for their novel integration of materials and energy. The first introduces a hybrid method for reducing the viscosity of heavy crude oil, combining microwave irradiation with a nanobiomaterial derived from okra powder. Achieving nearly 29% viscosity reduction, this work demonstrates how renewable additives can amplify the effects of electromagnetic heating. In a complementary vein, another study isolates the independent effects of microwave energy and acidic solutions on wettability alteration in carbonate reservoirs—providing much-needed clarity on two distinct mechanisms that can be leveraged for enhanced oil recovery.

Our understanding of failure and remediation is equally advanced. A thorough forensic investigation of finned-tube failures in a gas-complex dehydration furnace identifies sensitization, sulfide formation, and thermal mismatch as synergistic culprits—critical lessons for high-temperature furnace design. Meanwhile, two separate studies address petroleum wastewater: one achieves over 96% phenol removal via electrocoagulation and electrooxidation, while another demonstrates 97.5% COD reduction from spent caustic streams using recyclable Cu(BDC)/MgO nanocomposites and an artificial neural network to optimize treatment.

In the domain of biofuel production, we see microwave-assisted continuous transesterification of waste cooking oil yielding 93.4% biodiesel in just five minutes, alongside a central composite design study using ZnO nanoparticles and ultrasound that maintains >80% yield over seven catalyst cycles. Both underscore the power of intensified reaction environments.

Methodological rigor is on display as well, from ICP-OES analysis of metals in cements after microwave digestion to the use of ChemCad for modeling oily sludge processing with hydrocyclones, where a remarkable 97.9% hydrocarbon recovery was achieved. A case study from the Cuu Long Basin addresses the detection of thin-bedded reservoirs, a critical challenge as mature basins decline, and a review of locally formulated chemical demulsifiers offers a pragmatic path forward for developing economies.

Taken together, these papers reflect a discipline that is simultaneously fundamental and applied. I thank all authors, reviewers, and editorial staff for their dedication. I invite you to read deeply, question boldly, and apply wisely.

Sincerely,
Reza Zarghami

Journal of Chemical and Petroleum Engineering, 2026, 60(1): 1.
Publisher: University of Tehran Press