

Special Issue on
**Applied Chemistry in Upstream and Downstream
 Petroleum Operations**

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Practices with different types of chemicals for petroleum recovery and processing have been a prominent method of both upstream and downstream industries for many years. However, advancing science and technology established new challenges in the petroleum sector, especially with the breakthrough in unconventional oil and gas production such as heavy oil, extra heavy oil, and bitumen. This drives the researchers and engineers to develop and design novel chemicals for enhanced oil recovery techniques. Generally alkalis, surfactants, and polymers were employed to enhance the oil recovery, whereas chemicals are believed to complement thermal methods like steam assisted gravity drainage, cyclic steam stimulation, and steam flooding for bitumen and heavy oil recovery. There are some special chemicals which help in situ catalysis operations to upgrade heavy crude oil in place. Therefore, the development of new chemicals to withstand the harsh reservoirs conditions in terms of its heterogeneity, high salinity, and temperature marks a promising research area. The transportation of heavy crude through pipelines urges on improving and designing new surfactants, viscosity reducers, drag reducing additives, and catalyst agents. Microbial corrosion is a main reason that induces high operating as well as maintenance costs of pipelines in oil and gas industries. This can be prevented by a number of methods like regular mechanical cleaning, chemical treatment, and complete drainage and dry-storage. Among these methods, chemical treatment method is found to be evident that attracts attentions of several researchers in this particular field.

In case of downstream operations, the rise of unconventional oil production has obligated the refining industry to reconfigure the current facilities and to design novel methods for the treatment of heavy feedstocks. New process schemes and catalyst technologies are crucial for the proper conversion and upgrading of heavy oil. Also the improvement on analytical techniques to characterize heavy fractions helps the optimization of refineries and pipelines operations.

The purpose of this special issue is to publish high-quality research papers as well as review articles addressing recent advances on petroleum chemistry covering both upstream and downstream sectors. We invite scientific and industrial community to submit original, high-quality manuscripts that are not yet published or that are not currently under review by other journals or peer-reviewed conferences. Papers exploring the use of nanotechnology in upstream and downstream industries are of particular interest in this issue.

Potential topics include but are not limited to the following:

- ▶ Upstream
 - ▶ Alkali-surfactant-polymer flooding for enhanced oil recovery
 - ▶ Thermal enhanced oil recovery incorporating novel chemicals
 - ▶ In situ catalysis and chemical upgrading of heavy crude during oil recovery
 - ▶ Applications of chemicals in pipeline transportation of crude
 - ▶ Design and application of microemulsions in enhanced oil recovery
 - ▶ Chemically microbial corrosion control in downhole and oil pipelines
- ▶ Downstream
 - ▶ New technologies for product characterization in the oil refining industry
 - ▶ Advances in crude oil refining: separation, conversion, and finishing
 - ▶ Catalyst technology development for oil refining processes
 - ▶ Novel processes for refining heavy crude oil
 - ▶ Application of nanoparticles in upgrading bitumen/heavy oil
 - ▶ Separation of oil and gas by using nanoparticles and active solvents
 - ▶ Slurry phase in situ catalysis for vacuum residua upgrading

Authors can submit their manuscripts through the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/jchem/petroleum.chemistry/udpo/>.

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