Synthesis of the organometallic precursor for slurry-phase hydrocracking of heavy oil

Minchul Chung1, Seokhwan Son1, Sunyoung Park2 and Won Choon Choi2

1Sunchon National University, South Korea
2Korea Research Institute of Chemical Technology, South Korea

Today, heavy oil is looked to as a future energy source since its total reserves are estimated in 6.3 trillion barrels. Due to the recent decline in conventional crude reserves and an increase in the world energy demand, large amounts of residual oil must be upgraded into Light oil. However, its processing is not easy due to its characteristic high content of metals (Ni, V), sulfur and nitrogen, as well as high content of heavy molecules and asphaltenes. Heavy oils have been processed in the most varied ways going from solvent processes to fixed and ebullated bed hydrotreatments, slurry phase hydrocracking and their combinations. This study is in the field of upgrading heavy oil feedstocks into lower boiling, higher quality materials. More particularly, the study was synthesized a catalyst precursors containing molybdenum that can be mixed with heavy oil feedstocks to form a hydroprocessing catalyst and a method for making the catalyst precursors. New precursor was synthesized by using various ligands. These precursors were analyzed using a 1H (13C)-NMR, FT-IR, MS and ICP.

Correlation of facies distribution and sequence stratigraphic analysis of the latest Silurian to lower Devonian sequence in the eastern part of the Darling Basin, Western New South Wales Australia

Mohamed K A Khalifa1 and Kingsley J Milils2

1University of Zawia, Libya
2Lithosearch Geological Consulting, Australia

This work presents the facies controls on the sequence stratigraphic architecture of the latest Silurian to Lower Devonian sequence corresponding to the Winduck Interval in the eastern part of the Darling Basin, Western New South Wales, Australia. The study integrates wireline logs, drill cores and limited biostratigraphic data to determine the facies subdivision that has controlled sequence stratigraphic architecture. Sedimentological analysis was applied, using characteristic wireline-log responses, and core descriptions, to aid in the development of a depositional environment for the Winduck Interval. Twenty-two sedimentary facies are defined, forming five facies associations which were grouped into seven electrofacies defined by wireline log signatures. These facies associations are characterized as distributary channel sand complexes, distributary mouth bars, tidal channel sands, proximal delta fronts associated with mouth bar complexes, and distal delta front to prodelta sediments. The sequence stratigraphy of the Winduck Interval could be subdivided into four sequences in the two available wells (DM Kewell East DDH-1 and DM Mossgill DDH-1). Closer study of the sequence stratigraphy in the approximately 900 m thick Winduck Interval revealed ten parasequences (A-J) in progradational to retrogradational parasequence sets and four main Winduck sequences, WKS1, WKS2, WKS3 and WKS4, in ascending order. The integration of correlation techniques (log correlation, recognition of changes in core facies, electrofacies observation and parasequences) has helped to define the non-marine sequence stratigraphic model. This model of the Winduck Interval has the potential to refine existing sedimentary schemes and, given the higher resolution and more detailed correlation, may significantly improve subsurface stratigraphic reconstructions and aid in prediction of hydrocarbon-bearing reservoirs.