Effects of reaction parameters on hydrocracking of petroleum vacuum residue in supercritical hydrocarbon solvents

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Hydrocracking of petroleum vacuum residue was conducted in a batch reactor with two kinds of solvents, m-xylene and n-dodecane. To improve the reaction efficiency in hydrocracking of vacuum residue, supercritical solvents and different kinds of activated carbon have been used as compatible solutions and catalysts, respectively. In addition, severe operation conditions were required for the hydrocracking process, including high temperature, high hydrogen partial pressure.
In this study, the influence of various factors such as supercritical solvents, temperature, pressure, reaction time and other process parameters on the changes of conversion and coke formation were investigated. Lower coke formation was especially expected because of the deactivation of catalyst by coke formation.