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Study of solvent recovery in solvent deasphalting process

Seonju Ahn[1], Sangcheol Shin[1], Ki Bong Lee[1] and Nam Sun Nho[2]
[1]Korea University, South Korea
[2]Korea Institute of Energy Research, South Korea

Heavy crude oil can be classified into four fractions such as saturate, aromatic, resin and asphaltene. Asphaltene has high molecular weight and contains a lot of aromatic rings and heavy metals. These characteristics make heavy oil highly viscous and cause catalytic poisoning. For these problems, the availability of heavy crude oil is reduced. There are two methods for heavy crude oil upgrading: carbon rejection and hydrogen addition. Solvent deasphalting(SDA) process is one of carbon rejection methods. In SDA process, asphaltene can be separated from heavy oil bydensity difference resulted from different solubilities of oil components and asphaltene-free oil called deasphalted oil (DAO) is obtained. SDA process is composed of two main stages, asphaltene extracting and solvent recovery. Solvent recovery is a key procedure to reduce the operating cost of SDA process because a considerable amount of priceysolvent is used. In this study, solvent recovery stage of SDA process was simulated.Various solvents containing propane and butane which are mostly used in practical process were tested. DAO was defined as a mixture of pseudocomponentsin the simulation using its true boiling point data from SIMDIS analysis. Optimum conditions for maximizing the recovery of solvent were determined from the resultsof simulation with changing operating parameters like temperature and pressure.

sunjoostar@korea.ac.kr