Liquid-Liquid Extraction of Naphthenic Acids from Crude Oil By Using Diol with Additive Solution

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Crude oil contains naphthenic acids that can cause some problems in process such as deactivation of catalysts, corrosion of pipelines or equipments. To prevent these problems, upgrading low-quality crude oil has been required. In this work, solvent extraction method is investigated. Diol is used to remove naphthenic acids in crude oil, and additive solution is added to enhance extraction capability. Performances of solution are determined by conducting experiments. Solvent is blended with pseudo crude oil, the mixture of crude oil and naphthenic acids. Mixture of pseudo crude oil and solvent is kept for 2 hours at atmospheric pressure, and liquid-liquid equilibrium with crude oil and solvent is formed. Effect of temperature and the amount of solvent on the removal of naphthenic acids is examined through the experiment. The acidity of treated pseudo crude oil is measured by titration, and the performances of solvents are evaluated. The result shows that the solvent can remove naphthenic acids meaningfully. It is also observed that extraction capability is enhanced when experiment is conducted at higher temperature, larger amount of solvent is used, or additive solution is added.