ONLINE ISSN : 1349-273X
PRINT ISSN : 1346-8804

Journal of the Japan Petroleum Institute
Vol. 48 (2005) , No. 1 pp.60-66

[PDF (219K)] [References]

Separation of Coal Tar Fractions by Solvent Extraction— Extractant/Solvent Separation by Secondary Extraction—

Chris Salim[1)], Jun Saito[1)] and Ryuichi Egashira[1)]

1) Dept. of International Development Engineering, Graduate School of Science and Engineering, Tokyo Institute of Technology

(Received: August 3, 2004)

Solvent extraction was applied to the separation of tar light oil and absorption oil, and solvent recovery in the separation of these coal tar fractions by extraction with secondary oil solvent. The liquid-liquid equilibria were measured with various combinations of oil and aqueous methanol phases that occur throughout the whole extraction process. Based on the equilibrium results, a process separating absorption oil and tar light oil simultaneously with a single aqueous solvent is suggested, in which the two feed oils also act as secondary solvents for mutual separation. In the separation of feed oils by aqueous methanol solution as solvent, nitrogen heterocyclic compounds in the absorption oil and the tar light oil were extracted preferentially to other compounds including homocyclic hydrocarbons and oxygen heterocyclic compounds. In the solvent recovery in the separation of absorption oil, the aqueous extract phase containing aqueous solvent and extractants was separated by tar light oil as secondary oil solvent. In the solvent recovery in the separation of tar light oil, the aqueous extract phase was separated by absorption oil as the secondary oil solvent. The distribution coefficients were not affected by the type of oil phase of coal tar fraction and by the presence of the extractants in the aqueous phase. The distribution coefficients in all cases of oil phases of absorption oil and tar light oil could be classified into three groups: monocyclic nitrogen compounds, bicyclic nitrogen compounds, and other compounds including hydrocarbons and oxygen compounds. By integrating the two separation processes of absorption oil and tar light oil into one process separating both coal tar fractions simultaneously with a single aqueous solvent, several extractors and solvents

required in the two separate processes can be eliminated.

Keywords: Coal tar, Tar light oil, Absorption oil, Solvent extraction, Aqueous methanol solution, Nitrogen heterocyclic compounds

To cite this article:

Chris Salim, Jun Saito and Ryuichi Egashira, *Journal of the Japan Petroleum Institute*, Vol. **48**, No. 1, p.60 (2005) .

doi:10.1627/jpi.48.60

JOI JST.JSTAGE/jpi/48.60