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Separation of Coal Tar Distillate by Solvent Extraction —Separation of Extract Phase Using Distillation—

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Distillation was applied to separate the extracted components and the aqueous methanolic solution from the aqueous extract phase obtained from the solvent extraction of coal tar distillate. Equilibrium extraction of absorption oil, one of the coal tar distillates, was carried out with aqueous methanolic solution and confirmed that nitrogen heterocyclic compounds in absorption oil were selectively extracted into the solvent phase and these components and homocyclic hydrocarbons *etc.* could be separated by the extraction. The extract phase obtained from this extraction was separated by batch simple distillation. The distillation of the extract phase produced the liquid in the still consisting of two immiscible phases, extracted component-rich and water-rich phases, and methanol-rich distillate. The extracted and solvent components in the extract phase could be separated. The distillation also achieved further separation between nitrogen compounds and homocyclic hydrocarbons *etc.*, which remained in the recovered aqueous methanolic solution phase. The aqueous methanolic solution recovered from this distillation was reused as the solvent for another equilibrium extraction of absorption oil. The separability between nitrogen compounds and homocyclic hydrocarbons *etc.* was improved by the extraction with the recovered solvent, because the hydrocarbons *etc.* remaining in the recovered solvent restrained the transfers of these components from the feed absorption oil into the solvent phase. Based on these experimental results, a continuous steady state process separating coal tar distillate using solvent extraction and distillation was designed. Distillation has the potential to separate the extract phase in the extraction process to separate coal tar

distillate.

Keywords: [Coal tar](#), [Absorption oil](#), [Solvent extraction](#), [Aqueous methanolic solution](#),
[Solvent recovery](#), [Distillation](#)

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