

Palm methyl ester의 fractionation을 위한
분리벽형 증류탑의 설계

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This study presents an efficient design method for divided wall column (DWC) which can fractionate palm methyl esters (PME) into three more valuable product groups, i.e. a mixture of methyl laurate and methyl myristate as light-cut, pure methyl palmitate (> 99.0%) as middle cut, and the mixture of the remaining methyl esters, which has the good low-temperature operability such an extent as to come close to cold filter plugging point (CFPP) 0°C, as heavy cut. The first step of the design is to determine numbers of stages for four sub-sections of DWC, liquid split ratio, and initial reflux ratio by the shortcut design, based on the component net flow model and the method of Fenske, Underwood, and Gilliland (FUG method). Secondly, optimal reflux ratio, vapor split ratio, locations of stages for feed and side product were found out by sensitivity analysis in rigorous simulation. The results from the simulation model developed by the method show that the reboiler duty of a single DWC is about 30% less than that of two series columns in direct sequence and in indirect sequence.