

Design of a dividing wall column (DWC) for fractionation of coconut and palm kernel oil fatty acids

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DWCs can save energy and capital costs compared with conventional columns. This work provides a novel shortcut scheme for the design of DWCs that can be used to separate coconut and palm kernel oil fatty acids into 3 products. The proposed design method may be considered as two-tier methods. First, the short-cut method is used to estimate the minimum reflux ratio, number of trays and liquid split ratios. The results are then used to perform rigorous modeling by the Aspen Plus simulator. The proposed design method is applied to perform an economic analysis of DWCs and conventional columns for the purpose of comparison. Results of comparison show that the DWCs designed by proposed method exhibit significant energy savings. It is known that DWCs can achieve 30% of energy saving compared to traditional columns, which is supported by energy saving of 24.5% and 29.1% shown by the proposed DWC designs for the case of coconut and palm kernel oil fatty acids feedstock respectively.