

### Optimization Control of a Dividing Wall Distillation Column for minimum energy consumption

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A DWC is a single shell, fully thermally coupled distillation column, capable of separating a mixture of three or more components into high purity products. The idea of DWC isn't new and the studies reveal that, in general it can cut capital and energy costs by approximately 30%. But still industries have been a bit reluctant in accepting the design and this can be mainly attributed to the complexities in its control and operation management and more importantly to the absence of a general heuristic regarding the optimal operation (i.e. simultaneously achieving the goals of high purity and minimum energy requirement.) This paper investigates theoretically a general rule for the optimization of a DWC by concentrating on the 'liquid split ratio', (rL) as the manipulated variable. Simulation of a DWC was performed in 'Aspen HYSYS' environment making as base, the result of an earlier study that showed that minimum energy was required if the internal liquid and vapor flow conditions in the column were such, that light and heavy component compositions were separated maximally at the top and bottom of the column respectively, which is when the temperature difference, dT of the pre-fractionator is at its maximum.