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Hierarchical Control of a Distillation Column

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Abstract: **In this simulation study the operation of the conventional distillation column (column with one feed and two products) was investigated with the application of AspenPlus Dynamics™ software. Control structures of the column which separate a two-component mixture were studied. The aim of our investigation was to discover dynamic and steady-state effects of heating and cooling on tray temperatures. The relationship of the tray temperatures and the purity of the products were also identified. Based on the identified relationships a three level hierarchical control structure was created. On the lowest level of the hierarchy there are local controllers of heating and cooling. On the middle level of the control hierarchy the process variables are two tray temperatures and the output of the controllers is the set point of local controllers. On the top level of the control hierarchy the purity of the products are controlled over by manipulating the set point of the temperature controllers. This paper presents a case study of generating the hierarchical control structures.**

Keywords – Distillation, control, multilevel control