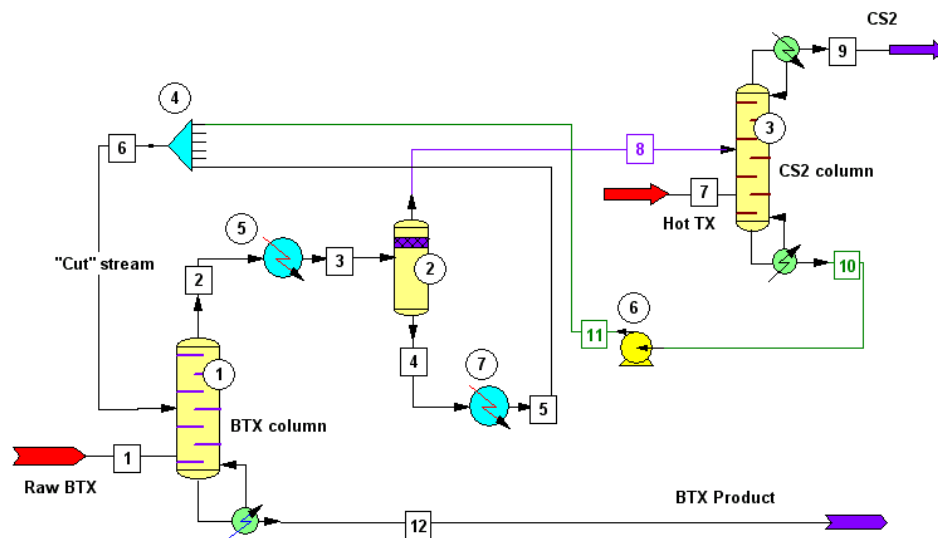# CS$_2$ Removal from Carbochemical BTX Sensitivity Study, Optimization

DESCRIPTION:

Raw mixture of benzene, toluene and xylene derived from coal coking contains toxic and explosive carbon disulfide, which is removed in dual-column distillation system.

First column actually removes CS2 from BTX, and the second one serves as the regenerator, in attempt to minimize the losses of aromatics from the system.

Numerous process parameters influence CS2 recovery as well as the aromatics' losses, specifically the loss of benzene.

Sensitivity Study tool allows the user to vary up to 2 any process parameters during the flowsheet calculations, as well as recording up to 12 other parameters. The result of the analysis is the chart showing the influence of the varied parameters on the process performance.

In this specific case, we have studied influence of the Column 1 condenser specifications on the CS2 recovery, benzene losses, and necessary recycle flowrate.

Alternative tool available in CHEMCAD 5 is Optimization. You can define the Objective Function, up to 10 Independent Variables and apply Constraints. Optimization usually achieves the solution much faster than the Sensitivity Study does. You can combine Optimization with Costing tool and the Calculator to optimize Investment Cost and Total Manufacturing Cost.