

243s Simulation-Aided Optimization of Voc Recovery Using Condensation

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A systematic simulation-based alternate approach for the recovery and recycle of volatile organic compounds (VOCs) from gaseous streams via condensation is introduced. This approach utilizes the application of the process simulation, and process integration techniques to achieve the optimum process condensation network. The optimal network is developed without pre-defining a structure for VOC condensation and with screening all the potential external cooling utility. This approach shows that the cost of cooling utilities can substantially be reduced through self-integration of the gaseous streams, and usage of the condensed liquid streams for cooling. Temperature path is used to facilitate the development of the optimal condensation network. In addition, linear programming is used to optimize the recycle of the recovered organics to process units (sinks) to reduce the process cost of fresh solvents. Using process simulators guarantees the thermodynamic non-ideality (phase equilibria) and the technical feasibility of the generated solutions. A case study is used to illustrate the effectiveness of the proposed methodology.