240q Optimum Waste Interception with Energy Integration Targets

Ahmad A. Hamad

In this work, the optimum structure for waste interception in chemical processes where waste is generated due to side reactions is tackled using mass and energy integration techniques. In certain situations, unwanted material (waste) is generated due to side reactions. The rate of these reactions is affected by the temperature of the system. This waste needs to be removed from the process to prevent its build up. In many cases, distillation is applied to remove such wastes and this result in more waste to be generated. The purpose of this work is to optimize waste interception networks for such waste while optimizing energy requirements of the process. The problem will be decomposed into several segments that will be optimized using mass and energy integration techniques. Process simulation will be used to assess unit performance. Mathematical formulation, pinch analysis and sensitivity analysis will be used to optimize the mass allocation and interception network and the energy requirements of the system.