

Split-Flow Method to Reduce Duty Required in Amine Gas Sweetening Units

Authors : Abdallah Sofiane Berrouk, Dara Satyadileep

Abstract : This paper investigates the feasibility of retrofitting a middle-east based commercial amine sweetening unit with a split-flow scheme which involves withdrawing a portion of partially stripped semi-lean solvent from the stripping column and re-injecting it in the absorption column to reduce the overall energy consumption of the unit. This method is comprehensively explored by performing parametric analysis of the split fraction of the semi-lean solvent using a kinetics based process simulator ProMax V 3.2. Re-boiler duty, condenser duty, solvent cooling and pumping loads are analysed as functions of a split fraction of the semi-lean solvent from the stripper. It is shown that the proposed method significantly reduces the overall energy consumption of the unit resulting in an annual savings of 325,000 USD. The thorough economic analysis is performed using Aspen Economic Evaluation V 8.4 to reveal that the retrofit scheme pays back the capital cost in less than eight years and is highly recommended for any commercial plant having suitable provisions for solvent inlet/withdrawal on the columns.

Keywords : split flow, Amine, gas processing, optimization

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