Process simulation of sodium methoxide production from methanol and sodium hydroxide using reactive distillation

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Sodium methoxide has been widely used in many applications such as biodiesel production and food, pharmaceutical and petrochemical processing. For biodiesel production, it is an important catalyst for transesterification of triglyceride and methanol to produce biodiesel. In a conventional sodium methoxide production process, methanol and sodium hydroxide as the reactants react in a reactor. Then the resulting solution is purified by two distillation columns to obtain sodium methoxide product. The process suffers from being high energy consumption. To improve the production process, applying reactive distillation has been proposed in this study. The process is simulated using ASPEN Plus software. Both column configurations and operating parameters are investigated in order to achieve the suitable design for sodium methoxide production. In addition, the system performances are compared with those of the conventional process. It is clear that the reactive distillation requires less energy consumption as well as fewer number process steps.

Keywords: Sodium methoxide; Sodium hydroxide; Reactive distillation