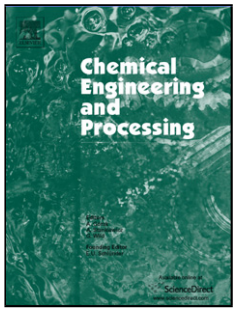

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A thermally coupled reactive distillation process to intensify the synthesis of isopropyl acetate

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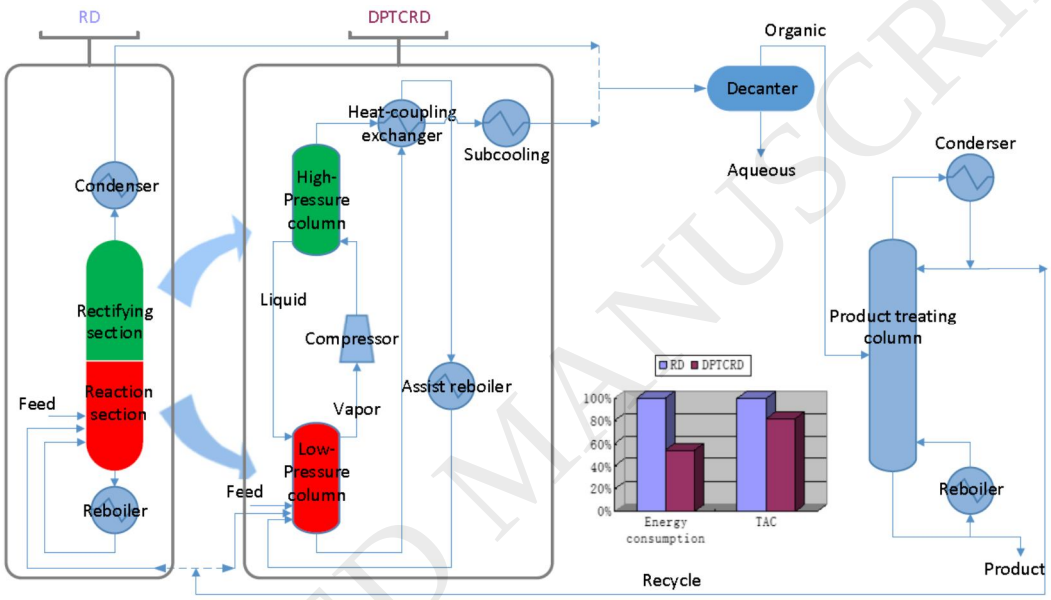
Graphical abstract



Highlights

1). A different pressure thermally coupled reactive distillation process is proposed.

2). High-purity isopropyl acetate product can be synthetized.

3). HP column pressure should be strictly controlled during heat coupling.

4). The energy requirement and total annual cost are both reduced.

Abstract

On the basis of analyzing the azeotropic behavior, comparing the accuracy of different property models and selecting reaction kinetics, a reactive distillation (RD) process for production of isopropyl acetate (IPAc) through the esterification of acetic acid and isopropanol is designed, through which high-purity isopropyl acetate product can be obtained. Besides, considering the high energy requirements of the RD process, a