عنوان مقاله:

Modeling of non-adiabatic reactors, used in Di-Methyl Ether (DME) synthesis

محل انتشار:

ششمین کنگره بین المللی مهندسی شیمی (سال: 1388)

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خلاصه مقاله:

Commercial processes for Di-Methyl Ether (DME) production are based on methanol dehydration over acidic catalysts in adiabatic fixed bed reactors. As the synthesis reaction is exothermic, to increase the equilibrium conversion, nonadiabatic shell-tube type reactors can be used. In this paper modeling of adiabatic and non-adiabatic reactors, using three cooling mediums in shell side of reactor in cocurrent and countercurrent flow regime, was performed. The cooling mediums used in this research are water in its boiling point (saturated water), methanol gas feed to reactor which is preheated in shell side and a special type of oil. Adiabatic reactor modeling shows good compatibility between our results and the data received from Haldor Topsoe Company. The results of non-adiabatic reactor modeling show that more conversion can be achieved in lower length of reactor although, in some cases, the maximum temperature in the tube side of reactor is more than the deactivation temperature of catalyst.

کلمات کلیدی:

Di-Methyl Ether, DME, modeling, non-adiabatic reactor, shell and tube reactor