عنوان مقاله:

Enhancement of DME Production via a Novel Hydrogen Permselective Membrane Reactor

محل انتشار:

دومین کنفرانس ملی فرآیند های گاز و پتروشیمی (سال: 1398)

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خلاصه مقاله:

Natural gas through syngas can be converted to the Dimethyl Ether (DME)as an economical and clean fuel, directly. In this configuration the synthesisgas is fed to the tube side and flows in co-current mode with reacting gasmixture that enters in the shell side of the reactor. In this way, the synthesisgas is heated by heat of reaction which is produced in the reaction side.Hydrogen can penetrate from the feed synthesis gas side into the reactionside as a result of a hydrogen partial pressure difference. The outletsynthesis gas from tube side is recycled to shells and the chemical reactionis initiated in catalytic bed. Therefore, the reacting gas in shell side is cooledsimultaneously with passing gas in tube and saturated water in outer shell.In this study, the results of novel membrane reactor (MR) are compared witha conventional DME synthesis reactor (CR) at identical process conditions.Simulation results show 12.63% enhancement in the yield of DMEproduction, and a favorable temperature profile along the membrane .DMEreactor in comparison with conventional reactor

کلمات کلیدی:

Direct DME synthesis, Membrane reactor, Pd/Ag membrane, onedimensional modeling