

Simulation of the Performance of the Reforming of Methane in a Primary Reformer

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Abstract : Steam reforming is industrially important as it is incorporated in several major chemical processes including the production of ammonia, methanol, hydrogen and ox alcohols. Due to the strongly endothermic nature of the process, a large amount of heat is supplied by fuel burning (commonly natural gas) in the furnace chamber. Reaction conversions, tube catalyst life, energy consumption and CO₂ emission represent the principal factors affecting the performance of this unit and are directly influenced by the high operating temperatures and pressures. This study presents a simulation of the performance of the reforming of methane in a primary reformer, through a developed empirical relation which enables to investigate the effects of operating parameters such as the pressure, temperature, steam to carbon ratio on the production of hydrogen, as well as the fraction of non-converted methane. It appears from this analysis that the exit temperature T_e , the operating pressure as well the steam to carbon ratio has an important effect on the reforming of methane.

Keywords : reforming, methane, performance, hydrogen, parameters

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