Pemodelan reformasi autothermal metana dengan katalis rodium pada reaktor monolit = Modelling autothermal reforming of methane using rhodium catalyst on monolith reactor

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Abstrak

Pemodelan numerik berdasarkan komputasi dinamika fluida (CFD) pada reaktor autothermal diteliti untuk meningkatkan kinerja unit industri gas sintesis dari bahan baku metana. Seluruh reaktor monolit yang dimodelkan memiliki bagian channel dan pelat. Pemodelan Simulasi dilakukan dengan memvariasikan komposisi umpan, temperatur umpan serta tekanan. Hasil simulasi menunjukkan bahwa profil konsentrasi metana dipengaruhi oleh temperatur umpan, rasio umpan dan tekanan gas. Berdasarkan hasil simulasi didapatkan konversi metana dan yield syngas optimal pada temperatur umpan 1200 K , rasio umpan O2/CH4 0,5-0,6 dan tekanan 1 bar.

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Numerical modeling based on computational fluid dynamics (CFD) in the autothermal reactor unit investigated to improve the performance of industrial gas methane synthesis of raw materials. The whole reactor monolith being modeled has a channel section and plate. Simulation modeling is done by varying the feed composition, feed temperature and pressure. The simulation results show that the methane concentration profile is influenced by the feed temperature, feed ratio and gas pressure. Based on simulation results obtained conversion of methane and syngas yield optimum feed temperature 1200 K, the feed ratio of O2 / CH4 0.5-0.6 and a pressure of 1 bar.