Uji kinerja reaktor katalis terstruktur pelat skala bench untuk produksi carbon nanotube dan hidrogen melalui reaksi dekomposisi katalitik metana = Performance test of bench-scale plate structured catalyst reactor to produce carbon nanotube and hydrogen via catalytic decomposition of methane

Ramaniya Anindita Wandawa, author

Abstrak

Penelitian dilakukan untuk melakukan uji kinerja reaktor katalis terstruktur pelat untuk produksi carbon nanotube dan hidrogen melalui reaksi dekomposisi katalitik metana. Katalis yang digunakan adalah katalis Ni-Cu-Al dengan perbandingan molar 2:1:1. Reaksi dekomposisi katalitik metana dilakukan pada suhu 700oC selama 5 jam, dengan variasi space time 0,0006; 0,0032; 0,006 gr min/mL. Hasil uji kinerja tertinggi didapatkan pada space time 0,006 gr min/mL dengan konversi metana tertinggi 83,01% , kemurnian hidrogen tertinggi 70,23% , dan yield karbon 2,5 gr/gr katalis. Carbon nanotube yang dihasilkan memiliki diameter dalam 7,5-15 nm dan berbentuk Y-junction.

<hr>

Abstract

The purpose of this research is to test the performance of plate structured catalyst to produce carbon nanotube and hydrogen via catalytic decomposition of methane. In this research, catalyst of Ni-Cu-Al with the molar ratio by 2:1:1 was used. The decomposition reaction took place at 700oC temperature for 5 hours, using 0,0006; 0,0032; and 0,006 gr min/mL space time variations. The maximum performance space-time was 0,006 gr min/mL with 83,01% for the highest number of methane conversion, 70,23% for the highest number of hydrogen purity, and 2,5 gr C/ gr catalyst carbon yield. The carbon nanotubes produced from the research were Y-junction-shaped and have 7,5-15 nm inner diameter.

;