



Conversion of Methane and Carbon Dioxide Using Catalytic Membranes (Paperback)

By Alexey Fedotov

Univ Europeenne, United States, 2011. Paperback. Condition: New. Language: French . Brand New Book. This study reports the development of a new process to convert methane and carbon dioxide into syngas from non-oil resources. The process uses membrane catalytic systems (MCS) that support heterogeneous catalytic reactions in gaseous phase in membrane channels. An active surface of the catalysts formed inside the micro- channels is low in term of area, but it is characterized by a high value of the catalyst surface/volume ratio, which induces a high efficiency of heterogeneous catalysis. Such MCS, having 10 8 pores per cm² of surface, can be considered as a set of nano reactors. MCS are formed from alkoxy derivatives and precursor metal complex containing between 0.008 and 0.055 by weight of nano- components mono-and bimetallic active distributed evenly in the channels. For systems La-Ce/Ni-Al and Pd-Mn/Ni-Al, productivities of 10500 and 7500 l/h dm³ were respectively obtained at 650 C with a composition of syngas H₂/ ranging from 0.63 to 1.25 and a conversion rate of 50 with a CH₄/ 2 (1/1) feed. Thus MCS is an order of magnitude more efficient than a fixed bed reactor of the same catalyst. A catalytic synergy has...



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