World Academy of Science, Engineering and Technology
International Journal of Industrial and Manufacturing Engineering
Vol:9, No:05, 2015

Unconventional Composite Inorganic Membrane Fabrication for Carbon Emissions Mitigation

Authors : Ngozi Nwogu, Godson Osueke, Mamdud Hossain, Edward Gobina

Abstract : An unconventional composite inorganic ceramic membrane capable in carbon dioxide emission decline was fabricated and tested at laboratory scale to develop in conformism to various environmental guidelines to mitigate the effect of global warming. A review of the existing membrane technologies for carbon capture including the relevant gas transport mechanisms are presented and discussed. Single gas separation experiments using silica modified ceramic membrane with internal diameter 20mm, outside diameter 25mm and length of 368mm deposited on a macro porous supported reactor.was carried out to investigate individual gas permeation behaviours at different pressures and membrane efficiency after a dip coating method. Nitrogen, Carbon dioxide, Argon, Oxygen and Methane pure gases were used to investigate their individual permeation rates at various pressures. Results show that the gas flow rate increases with pressure drop. However at above a pressure of 3bar, CO2 permeability ratio to than the other gases indicated control of a more selective surface adsorptive transport mechanism.

Keywords : carbon dioxide, composite membranes, permeability, transport mechanisms
Conference Title : ICMPE 2015 : International Conference on Manufacturing and Production Engineering
Conference Location : Montreal, Canada
Conference Dates : May 11-12, 2015