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Gas separation process: analysis of composite membranes based on alumina/PVDF at lower power consumption energy

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ABSTRACT

Human activity have been emitting greenhouse gases into the atmosphere for a long time. To separate these gases, especially CO_2 and CH_4, polymeric membranes have been used in the chemical industry as this technology has a lower power consumption when compared to other separation processes. In this work, α-alumina ceramic tubes (support) were internally impregnated with poly(fluoride vinylidene) (PVDF), and the permeability and selectivity of the membrane to CO_2, CH_4, and O_2 was studied. All membranes (MT1 and MT2), when tested at low pressures, presented higher selectivity to CH_4 gas, and with increasing pressure the selectivity for CO_2 increased as well. The MT2 membrane was more efficient in the separation of CO_2/CH_4 gases, which is an important result because both of them are the most impacting gases to the greenhouse effect and the most difficult to separate using membrane process.

Keywords: Composite membranes; Alumina/PVDF; Gás separation; GHG

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