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

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\textbf{ABSTRACT}

Human activity have been emitting greenhouse gases into the atmosphere for a long time. To separate these gases, especially CO\textsubscript{2} and CH\textsubscript{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\textsubscript{2}, CH\textsubscript{4}, and O\textsubscript{2} was studied. All membranes (MT1 and MT2), when tested at low pressures, presented higher selectivity to CH\textsubscript{4} gas, and with increasing pressure the selectivity for CO\textsubscript{2} increased as well. The MT2 membrane was more efficient in the separation of CO\textsubscript{2}/CH\textsubscript{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.

\textit{Keywords}: Composite membranes; Alumina/PVDF; Gás separation; GHG

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