Membranes for hydrogen separation: A significant review

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ABSTRACT

Hydrogen (H2)-selective membranes involve significantly less energy and generally a better way to manage them. Partial inlet/outlet pressure of H2, as well as temperature, are the best parameters for membrane processes. Membrane processes are appropriate for portable applications and small scale as opposed to other separation techniques. The membrane can also be performed at different pressure and temperature ranges. The critical purpose of the separation membrane is the suitable usage in membrane reactors that permit the purification and production of synchronous H2. Observations of alterations in the structural and chemical properties have been commonly performed to understand the process by which polymers degrade. The validity of each observational procedure depends primarily on the test material and type of degradation. An appropriate method for the characterization of polymers can often be utilized to examine the properties of degradation. The service life of a polymer depends strongly on the conditions to which the material is subjected. On the other hand, the stability of the material, including nanocomposite polymer blends, often dictates its usefulness. Thus, this review was aimed to evaluate the degradation of nanocomposite polymer blends, with specific focus on the role of the fillers and the composition of the blends. The factors that could significantly affect the degradation of the same were the presence of a filler, as well as the morphology and composition of the blends.

KEYWORDS

Hydrogen separation; Polymer degradation; Photodegradation; Durability; Energy

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