

509g Theoretical and Experimental Analyses of Fiber Property Variation in Hollow Fiber Membrane Module for Permeate Purification of Oxygen from Air

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Abstract

A theoretical and experimental study of the effects of fiber property variation on permeate purification using hollow fiber membrane modules is presented. Effects of variation in fiber inner diameter, permeance, and selectivity are considered. The performance drops as the degree of variation increases or the product recovery increases. The experimental results agree well with the theoretical predictions for oxygen purification from air. Additionally, the membrane area required does not change significantly with change in variation. The analysis allows one to establish fiber quality control guidelines to ensure minimum performance levels can be achieved in single modules or multiple module, staged systems.