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Membrane technology for CO_2 removal from CO_2-rich natural gas

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1. Introduction

Gas separation is required to remove contaminants, hazardous gases, and CO_2 in order to produce gas that meets consumer demands. Membrane gas separation is a typical gas separation method. Membrane gas separation processes, such as absorption, distillation, and adsorption, provide various benefits, including minimal cost, simplicity of handling, higher selectivity, and the potential to connect with other operations [1]. Presently, the primary emphasis is on developing technology and polymer manufacturing for improved selectivity and permeability in order to meet demand. Numerous studies are being conducted to separate CO_2/CH_4 and O_2/N_2 from air and natural gases [2]. Membrane performance is determined by its manufacture and material structure, as well as separation mechanism [3].

Benchold started the voyage of membrane gas separation in 1907 [4]. He was a pioneer in the development of nitrocellulose membranes with varying pore sizes. Collodion membranes with microparticle sizes first appeared on the market on a small scale in 1930s, when more refined membrane manufacturing procedures were devised [5,6]. Various polymers, such as cellulose acetate,

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