The Basic Design for PSA (Pressure Swing Adsorption) Process

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This work focuses on the development of an energy efficient hybrid gas separation system to purify Coal Bed Methane (CBM) gas consisting of mainly methane and other impurities such as carbon dioxide, ethane, and so on. We compared three main separation processes – absorptions, adsorptions, and membranes – and adopted the adsorption and membrane processes as candidates for the conceptual design work, considering the pilot plant scale and utilization purposes. Based on the case studies of several process configurations, the optimal conceptual design is suggested for the CBM purification by adopting the hybrid system of PSA and membrane processes, which is energy efficient and shows good purity and recovery.