

## Optimal Design of Vacuum Pressure Swing Adsorption Plants for CoalBed Methane Purification

고대호<sup>†</sup>

GS건설

(daeho.ko@gsconst.co.kr<sup>†</sup>)

This study introduces an optimization technology to design vacuum pressure swing adsorption (VPSA) processes for the purification of coalbed methane (CBM). The employed VPSA processes show better performances than pressure swing adsorption processes (PSA) in recovering methane from the CBM gas consisting of mainly methane and impurities such as carbon dioxide. The recently developed simulation modeling approach of Ko(2016) and the optimization algorithm of Ko et al. (2005) are adopted for this work. In summary, (1) a VPSA pilot plant at CBM test site is designed by using the mathematical modeling approach, (2) the trends of operating variables affecting the performances such as methane purity and recovery are analyzed, and (3) successful scale up designs are reported from a laboratory scale process through a large commercial scale VPSA plant using the simulation and optimization approach.

Keywords: CoalBed Methane (CBM), Vacuum Pressure Swing Adsorption (VPSA), Simulation, Optimization