

Theoretical Separation Feasibility of Zeolites for Gas Sweetening Process

가성빈, 차재훈, 정용철[†]

부산대학교

(greg.chung@pusan.ac.kr[†])

Because of the economic value of adsorptive separation processes, various adsorbent materials have been studied aiming for the gas sweetening of natural gas. In the evaluation of their materials, many studies depend more on the key performance indicators such as working capacity and selectivity, but they rarely provided the feasibility about the separation of sour gases, CO₂ and H₂S. To see whether a given adsorbent separates those sour gases, the propagation of the saturation regions should be considered in the separation process. Only when CH₄ is a leading component, the adsorbent can separate the sour gases. Based on this, we propose a method providing the separation feasibility, which is derived based on an ideal pressure swing adsorption process. For many zeolites in IZA database, their Grand Canonical Monte Carlo (GCMC) results were tested with this method. Also, the feasible zeolites were evaluated based on the processes with single and multiple PSA trains.