

Performance analysis of hydrogen separation system from ternary mixture gases by PSA

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Experiment and simulation are performed for bulk separation of ternary mixture gases ($H_2/Ar/CH_4$; 60%/20%/20%) by PSA process on activated carbon bed. For the optimized adsorption condition of PSA, the characteristics have been studied through breakthrough experiments under various conditions. The parameter of feed flowrate, adsorption pressure and P/F ratio is important to the H_2 product purity at adsorption step. The result of simulation predicted by the LDF model considering an energy balance and LRC isotherm. The concentration profiles inside the adsorption bed are investigated until cyclic steady states. Therefore, argon played a key role in producing high-purity hydrogen in PSA instead of methane.