Economy Evaluation of Moving Bed Adsorption Process for post-combustion CO_2 capture

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Energy supply and environmental problem related to global warming has been the most important issue in the world. To stably supply energy dominantly based on fossil fuel and prevent GHGs emission simultaneously untill renewable energy is firmly developed and commercialized, CCS technology has been considered as a key solution. Nowadays, establishing the economy feasibility of CCS introduction is a main research point. Since the cost of CO2 capture part possesses major portion in overall CCS cost, relevant researches are intensively concentrated to the capture part. Under this circumstance, Moving bed adsorption (MBA) process which is new-concept capture process using adsorption with zeolite 13 X was developed. In order to enhance the economy feasibility, counter-current flow system which can facilitate internal heat integration was employed. With rigorous numerical model and simulator, process analysis related to column sizing and internal physical behavior and finally economy evaluation was also performed. It can reveal some obvious advantages based on the comparison of the result of economy evaluation with other commercialized capture process such as MEA process.