

## Development of separation process for H<sub>2</sub> recovery from low purity gas stream

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According to the increasing demand for hydrogen, producing high purity hydrogen from various effluent off-gases such as catalytic reforming gas, synthesis gas and coke oven gas have been widely studied. Furthermore, as interest and demand for the hydrogen and its applications, the development of hydrogen separation process needs to recover the hydrogen from low purity hydrogen stream. In this study, the gas separation process was developed experimentally and theoretically through the adsorption technology for hydrogen recovery low H<sub>2</sub> purity stream. Separation performance of mixture gas was evaluated by the semi-batch system, which is packed with two types of adsorbent. Then, continuous hydrogen separation was developed by setting the optimal step time and regeneration condition from separation performance experiment. To achieve 99+ % or 99.9+ % of hydrogen purity on product and increasing product recovery, the various cyclic configuration was suggested, and each performance was compared. In the dynamic simulation, developed processes showed performance in the range of 97.96–99.94% purity and 42.56–83.90% recovery.