

CO₂ capture using Pd-based hydrogen selective membrane for pre-combustion CCS

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As one of carbon capture and storage(CCS) technologies, pre-combustion, where synthesis gas from a gasifier or reformer is water-gas shifted to CO₂ and H₂, and then CO₂ is separated from the H₂ mixture, is considered as a clean energy technology and under development in many countries like the USA, Canada, Japan, and Europe. The membranes are seen as an attractive technology for this technology because they can combine efficient production of hydrogen with capture of the remaining CO₂. Among many kinds of membrane, Pd and its alloy have attracted a great deal of attention due to their high hydrogen permeability and chemical compatibility with hydrocarbon-containing gas streams.

In this study, Pd-based membranes were used for hydrogen separation in a CO₂ mixture. The goal was to study the feasibility of separating hydrogen for CO₂ capture and hydrogen purification using Pd-based composite membranes.