Shift catalyst reactive at low temperatures for next-generation coal-fired power generation

Integrated Coal Gasification Combined Cycle with CO₂ Capture (CCS-IGCC)

CCS-IGCC is next-generation technology that turns coal into gas and which makes CO react with H₂O (steam) on a shift catalyst producing CO₂ and H₂. The CO₂ is then captured and stored and the remaining H₂ is used as fuel.

Characteristics

① The shift catalyst uses molybdenum on the surface of the catalytic site. By optimizing the catalytic site component, a higher dispersion of molybdenum particles than conventionally achieved can be attained.

② The molybdenum needs to be sulfurized before the shift catalytic reaction. By adding a new ingredient to promote the sulfurization of molybdenum, the catalytic surface was successfully increased.

③ Plan
A pilot test will be conducted, and then, we will promote the research and development for commercial application.

A word from the development team
This technology will contribute to the protection of the global environment through reducing CO₂ emission in coal-fired power generation and by the generation of chemical by-products.

Achievement

The shift catalyst contributes by-reducing the steam supply during CO₂ capture by 30%.
⇒ More steam can be used for power generation.

Highly efficient power generation has been achieved.