



Supercritical CO₂-Ethanol from Producing Liquids from Coal

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Patent Status: Patent Pending

Description of Technology

Liquid tar contains both abundant valuable chemicals and carbon material precursors. Conventional technologies used to extract liquid tar from coal include pyrolysis, gasification, and liquefaction. These methods usually only yield in a range of around 5-10 weight percentage (wt%) of liquid tar from coal according to a study done by the inventor's research group. They also have strict operating conditions (greater than 800°C), are a long technological process, have high production cost, high-energy consumption, and severe pollution, making them unsustainable from both economic and environmental aspects.

Researchers at the University of Wyoming invented a new way of extracting liquid tar from coal that is better than the current methods. By using a supercritical CO₂ and ethanol mixture (scCO₂-ethanol), they were able to obtain a yield of about 50 wt% of liquid tar from coal under optimal conditions. Temperature is the most important parameter to promote the yield of liquid tar and the researchers' method can proceed at only 350°C. Compared to the conventional technologies, this new process is a greener, environmentally benign, efficient, and a value-added technology for producing valuable chemical and carbon material precursors from coal. This technology could be a new way for efficient, non-fuel use of coals or other carbon resources.

Applications

This technology can be used to create a non-fuel use for coal. It can extract liquid tar out of coal which contains valuable chemicals and carbon material precursors that can be used to create carbon fiber.

Features & Benefits

- 50 wt% of liquid tar from coal
- Method can proceed as low as 350°C
- Environmentally benign
- More efficient than current methods
- Creates a new non-fuel use for coal

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