



A Near Zero CO₂ Emission Coal Processing Technology for Chemical and Material Production

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Patent Status:

Patent Pending

Description of Technology

There is an increased focus on developing new and alternative energy resources, but traditional fossil fuels including petroleum, coal and natural gas still remain dominant sources of our energy supply. Carbon dioxide (CO₂) is a byproduct of fossil fuel use and increased atmospheric CO₂ levels have motivated research on CO₂ capture and how it can be used for beneficial purposes..

Researchers at the University of Wyoming have developed a new fossil fuel utilization and CO₂ capture application. The new innovation is a self-energy supplying and high value-added coal-based chemicals production process. The CO₂ generated in this process is recycled and utilized in order to achieve near zero carbon emissions. This process integrates four steps: CH₄/CO₂ based syngas production, chemicals-oriented oil production, Ti-based CO₂ absorption, and desorption and CO₂/H₂O reforming for CH₄.

Applications

- There is an internal carbon cycling that creates favorable conditions for coal pyrolysis, contributing to high value-added coal-based chemical production with lower CO₂ emissions.
- The system's internal self-sufficiency is achieved without any increased demand from external energy and raw material supplement; the only source of raw material and energy for the system is potentially coal, with resulting products being coal-based chemicals such as phenol, benzene, Naphthalene, etc., which have value and can be used for other applications.

Features & Benefits

- This CO₂ conversion and utilization technology is capable of recycling the carbon in the system, forming a closed-circuit carbon system.
- This is an additional way to utilize fossil fuels while controlling CO₂ emissions to a near-zero level.



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