



Contribution ID: 421

Type: **Poster Presentation**

Relationship between Pore Structure and Reaction Characteristics in Supercritical Water Gasification of Chunk Coa

Wednesday, 15 May 2024 09:25 (1h 30m)

Due to the essential differences in mass and heat transfer in supercritical water pyrolysis of lump coal, this study focuses on low coalification degree lignite. Employing an organic rock supercritical water reaction apparatus in conjunction with nuclear magnetic resonance and differential scanning calorimetry, we investigated the reaction characteristics of chunk coal supercritical water gasification under continuous water injection conditions. The study explored the influence of different temperatures, pressures, and gasification reaction times on mass and heat transfer, gas yield, and composition of chunk coal. The research outcomes reveal: 1) With increasing temperature and pressure, the specific heat capacity exhibits an initial rise followed by a decline; 2) Carbon gasification efficiency improves with prolonged reaction time, while H₂ yield shows an initial increase followed by a decrease; 3) Combining nuclear magnetic resonance images with DSC curves, it is observed that with the extension of temperature and reaction time, the fractures in chunk coal increase, leading to enhanced mass and heat transfer efficiency.

Acceptance of the Terms & Conditions

[Click here to agree](#)

Student Awards

Country

China

Porous Media & Biology Focused Abstracts

References

Conference Proceedings

I am not interested in having my paper published in the proceedings

Primary author: ZHANG, Xuanhao (Taiyuan University of Technology)

Presenter: ZHANG, Xuanhao (Taiyuan University of Technology)

Session Classification: Poster

Track Classification: (MS17) Complex fluid and Fluid-Solid-Thermal coupled process in porous media: Modeling and Experiment