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Absorption of components in bio-oil on coal and its effects on stability and rheology of coal/bio-oil slurries

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Biomass was considered as a carbon neutral fuel. While the utilization of bio-oil was difficult due to high oxygen content and acidity. The preparation of slurries using bio-oil and coal was a prospective method for bio-oil utilization since bio-oil could contribute heating values to reduce coal consumption. Compared with commercial coal/water slurries (CWS), the coal loadings in coal/bio-oil slurries (CBS) are relatively low and CBS are more viscus. In the present study, the interactions between bio-oil and coal was investigated to improve the stability and rheology of CBS. Results show that typical components in bio-oil such as phenol, pyridine and quinoline are easily absorbed on the coal surface and form a film which could affect the stability and rheology. The adsorption of these components on coal surface are quinoline> pyridine> phenol. There is also a competitive absorption between these components on the coal surface.
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