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Characteristics of oil shale pyrolysis in a two-stage fluidized bed

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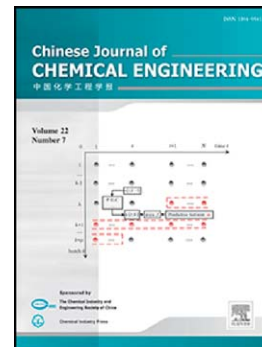
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Energy, resources and environmental technology**Characteristics of oil shale pyrolysis in a two-stage fluidized bed[☆]****Author details:**

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ABSTRACT

Rapid pyrolysis of oil shale coupled with in-situ upgrading of pyrolysis volatiles over oil shale char was studied in a laboratory two-stage fluidized bed (TSFB) to clarify the shale oil yield and quality and their variations with operating conditions. Rapid pyrolysis of oil shale in fluidized bed (FB) obtained shale oil yield higher than the Fischer Assay oil yield at temperatures of 500-600 °C. The highest yield was 12.7 wt % at 500 °C and was about 1.3 times of the Fischer Assay oil yield. The heavy fraction (boiling point > 350 °C) in shale oil at all temperatures from rapid pyrolysis was above 50%. Adding an upper FB of secondary cracking over oil shale char caused the loss of shale oil but improved its quality. Heavy fraction yield decreased significantly and almost disappeared at temperatures above 550 °C, while the corresponding light fraction (boiling point < 350 °C) yield dramatically increased. In terms of achieving high light fraction yield, the optimal pyrolysis and

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