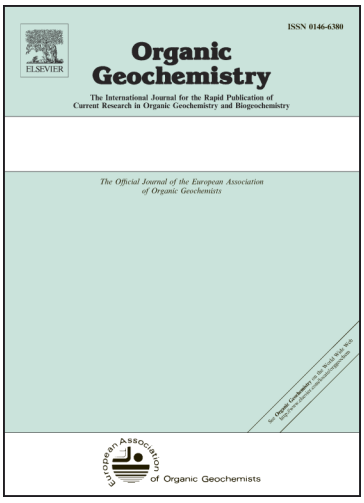

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Main factors influencing the formation of thermogenic solid bitumen

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ABSTRACT

Highly mature solid bitumen, a residue of oil cracking, is widespread in the lower Paleozoic paleo-oil reservoirs of southern China. Solid bitumen is not a simple, pure component, but rather a compositionally and structurally variable mixture of materials. This study investigated the formation of thermogenic solid bitumen and the effects of oil composition and reservoir environment. Seven series of gold-tube pyrolysis experiments were conducted: three used the main fraction groups (i.e., saturated, aromatic, and resin+asphaltene fractions) of crude oil to evaluate the effect of oil composition on the formation of solid bitumen during cracking; the other four tested the effects of water and pressure in reservoirs by simulating the cracking of crude oil under different reservoir conditions. Quantitative analyses of pyrolytic products (including methane, C_2–C_5 gaseous hydrocarbons, C_6–C_{13} light hydrocarbons, C_{13+} heavy hydrocarbons, and solid bitumen) indicated that thermogenic solid bitumen formed at

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