

The quantitative determination of organic sorption capacity in the Paleozoic shales from South China

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The methane sorption capacity of kerogen isolated from Cambrian, Silurian and Permian shales and the impact of soluble organic matter (SOM) on the sorption capacity of these shales were investigated. The results show that:

1) The sorption capacity of kerogen vary in a broad range, as from 14.48 to 23.22 cm³/g at STP for Cambrian kerogens, from 15.50 to 36.06 cm³/g at STP for Silurian kerogen and from 10.71 to 11.15 cm³/g at STP for Permian kerogens, respectively.

2)The kerogen sorption is accounted for 36 ~ 78% of the total adsorption capacity of these Paleozoic shales and demonstrated that kerogen is the primary adsorbing substance in shales.

3)The sorption isotherms of kerogen in these highly mature Cambrian and Silurian shales are similar to that of Triassic coal, while the isotherms of kerogen in the relative low mature Permian shales are similar to that of kerogen in the immature oil shales.

4)The soluble organic matter displays a significant impact on the adsorption capacity of shales as the removal of soluble organic matter could cause a maximum change of 34% increases to 23% decreases in the total sorption capacity of shales, but there is no clear understanding on the mechanism of SOM impact on the methane sorption of shales yet.

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