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A fractal model of permeability for shale gas in fractal fracture networks

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Abstract

Random fractures widely exist in water/oil reservoirs, soils etc. Study of the permeability of the fractured networks has been one of focuses in the area of mass transfer in the past decades. Generally, the fractures in scale reservoirs distribute randomly and have statistical self-similarity and fractal characteristic. In this paper, the permeability model for gas flow in the fractured networks in shale reservoirs is derived based on the fractal geometry theory with gaseous slip flow included. The validity of the proposed model is verified by comparisons between the model predictions and experimental data, and the parametric study is also performed in detail. The present results show that the proposed permeability model can reveal more mechanisms of seepage characteristics in the media than the traditional models.

References

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