



Thermodynamically consistent model of brittle oil shales under overpressure

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The concept of dual porosity is a common way for simulation of oil shale production. In the frame of this concept the porous fractured media is considered as superposition of two permeable continua with mass exchange. As a rule the concept doesn't take into account such as the well-known phenomenon as slip along natural fractures, overpressure in low permeability matrix and so on. Overpressure can lead to development of secondary fractures in low permeability matrix in the process of drilling and pressure reduction during production. In this work a new thermodynamically consistent model which generalizes the model of dual porosity is proposed. Particularities of the model are as follows. The set of natural fractures is considered as permeable continuum. Damage mechanics is applied to simulation of secondary fractures development in low permeability matrix. Slip along natural fractures is simulated in the frame of plasticity theory with Drucker-Prager criterion.