

## Definition of mechanical facies for domanik shale formation (Unconventional oil source)

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### Abstract

© SGEM2018. The Volga-Ural petroliferous basin is the oldest oil producing region of Russia. Therefore, most of the major oil and gas fields of traditional types here are already at the final stage of production. This provides for the increasing interest to develop unconventional resources of hydrocarbons associated with potential resources of the Upper Devonian-Lower Carboniferous (Tournaisian) Domanik-type sedimentary formations. This study focused on the geomechanical and petrophysical evaluation of the Domanik Formation and Domanikoids (younger rocks overlying the Domanik Formation) rocks. These are low-permeable cherty limestone or organic-rich mudstone rocks. We have investigated core samples from 6 wells from several oil-bearing areas. Laboratory studies of intact rock core specimens were carried out to determine rock failure parameters, cohesion and angle of internal friction under representative reservoir loading/stress conditions; and to estimate static and dynamic elastic modulus (Young's modulus and Poisson's ratio) under representative reservoir loading/stress conditions. Samples porosity, permeability and volumetric bitumen content were obtained by routine core analysis (RCA) technics. End faces of the specimens were used for mineralogical thin section optical analysis, X-ray diffractometry and X-ray fluorescence spectroscopy. Inferred from the results, we have distinguished three mechanical facies of the Domanik Formation and Domanikoids rocks substantially different in terms of chemical, mineralogical composition and petrophysical properties. Outcomes may assist to optimize the development of multistage hydraulic-fracturing technology in horizontal wells.

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### Keywords

Carbonates, Geomechanics, Laboratory core analysis, Lithological facies, Unconventional oil

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