

Paulina KRAKOWSKA¹, Edyta PUSKARCZYK¹, Mariusz
JĘDRYCHOWSKI², Magdalena HABRAT¹, Paweł MADEJSKI³

¹AGH University of Science and Technology, Faculty of Geology, Geophysics and Environmental Protection, Al. Mickiewicza 30, Krakow (Poland)

²AGH University of Science and Technology, Faculty of Physics and Applied Computer Science, Al. Mickiewicza 30, Krakow (Poland)

³AGH University of Science and Technology, Faculty of Mechanical Engineering and Robotics, Al. Mickiewicza 30, Krakow (Poland)

Into the pore space – petrophysical interpretation of computed X-ray tomographic data of tight rocks

Abstract

Unconventional reservoirs until now challenge scientists and specialists from petroleum industry for better understanding the internal pore space and skeleton structure. Combination of different laboratory methods, based on various physical laws, provides wide range of information about their heterogeneity in petrophysical parameters. Palaeozoic formations from Poland were under consideration in application of X-ray computed tomography (CT). Research material consisted of core samples from tight hydrocarbon-bearing sandstone and carbonates reservoirs. CT was carried out on core samples with resolution: 0.6x0.6x0.6 μm . Several parameters of pore space were calculated based on tomographic images and newly developed software for qualitative and quantitative interpretation of porous materials (poROSE). CT has undeniable supremacy on other laboratory methods because of possibility to create the 3D visualization of analyzed sample. 3D visualization of pore space in poROSE software allowed to categorize samples in regards to pore space development. Petrophysical analysis of CT results gave a detailed and novel answer about the pore space development in tight rocks.

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