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Exploration of Hydrocarbon Unconventional Accumulations in the Argillaceous Formation of the Autochthonous Miocene Succession in the Carpathian Foredeep

Authors : Wojciech Górecki, Anna Sowiżdżał, Grzegorz Machowski, Tomasz Maćkowski, Bartosz Papiernik, Michał Stefaniuk

Abstract : The article shows results of the project which aims at evaluating possibilities of effective development and exploitation of natural gas from argillaceous series of the Autochthonous Miocene in the Carpathian Foredeep. To achieve the objective, the research team develop a world-trend based but unique methodology of processing and interpretation, adjusted to data, local variations and petroleum characteristics of the area. In order to determine the zones in which maximum volumes of hydrocarbons might have been generated and preserved as shale gas reservoirs, as well as to identify the most preferable well sites where largest gas accumulations are anticipated a number of task were accomplished. Evaluation of petrophysical properties and hydrocarbon saturation of the Miocene complex is based on laboratory measurements as well as interpretation of well-logs and archival data. The studies apply mercury porosimetry (MICP), micro CT and nuclear magnetic resonance imaging (using the Rock Core Analyzer). For prospective location (e.g. central part of Carpathian Foredeep – Brzesko-Wojnicz area) reprocessing and reinterpretation of detailed seismic survey data with the use of integrated geophysical investigations has been made. Construction of quantitative, structural and parametric models for selected areas of the Carpathian Foredeep is performed on the basis of integrated, detailed 3D computer models. Modeling are carried on with the Schlumberger’s Petrel software. Finally, prospective zones are spatially contoured in a form of regional 3D grid, which will be framework for generation modelling and comprehensive parametric mapping, allowing for spatial identification of the most prospective zones of unconventional gas accumulation in the Carpathian Foredeep. Preliminary results of research works indicate a potentially prospective area for occurrence of unconventional gas accumulations in the Polish part of Carpathian Foredeep.

Keywords : autochthonous Miocene, Carpathian foredeep, Poland, shale gas
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