

THERMAL HISTORY OF PALAEOZOIC SOURCE ROCKS IN WESTERN POMERANIA (NW POLAND): ILLITE-SMECTITE AND VITRINITE REFLECTANCE GEOTHERMOMETERS

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Thermal history of Palaeozoic oil and gas source rocks occurring in the Western Pomerania is difficult to reconstruct mainly due to fault block tectonics resulting from its position near the Teisseyre–Tornquist line. Dinantian sedimentation basin is considered to represent the back arc basin, periodically intensely supplied with volcanic material, being the source of primary occurring smectite mineral. Consequently, the illite-smectite geothermometer (illitisation of smectite) was used in this study. The Dinantian series is a slope-lagoonal sequence rich in organic matter. Therefore, it enables the application of organic geothermometer (vitrinite reflectance).

As follows of the present studies, the thermal maturity of the rocks studied is variable, depending on the depth of burial of individual tectonic blocks. The results obtained by both geothermometers are compared for the Kołobrzeg and

Drzewiany blocks, situated differently with respect to Teisseyre–Tornquist line. Illitisation of smectite for the Drzewiany block and coalification degree of organic matter are lower than for the Kołobrzeg one. The content of expandable layers in mixed layer illite-smectite from Drzewiany block amounts, on the average, to cca. 15% what indicates medium-stage diagenesis, whilst for Kołobrzeg one it is below 10%, corresponding to late-diagenetic stage. Similar conclusions result from the measurements of vitrinite reflectance, amounting to cca. 0.74% for the Drzewiany block and cca. 0.86% for the Kołobrzeg one.

Acknowledgements

This work was financially supported by the AGH University of Science and Technology (Grant no. 11-11-140-459).