



The influence of the thrust over the evolution of the thermal regime of the Vrancea Nappe source rocks (Eastern Carpathians). A 1D simulation of the Șipoteni oil structure (Romania)

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Abstract

The aim of the present paper is to highlight the variations in thermal regime caused by the thrusting of the Tarcău Nappe over the Vrancea Nappe during the New Styrian tectono-genesis. The one-dimensional analysis was carried out for the sedimentary column opened by the S300 well within the Șipoteni oil structure (Comănești Basin area). This involved the overlapping of the temperature isolines over the burial curves of the source rock-bearing formations. The computation of temperatures for the time period after the thrust was performed using the equation for heat transfer in an unsteady regime (Angevine and Turcotte, 1983), which requires knowing certain local physical and thermal parameters. Regarding the thermal parameters, given the lack of laboratory or *in situ* measurements, thermal diffusivity was indirectly estimated, through mathematical simulation, while the thermal gradient of the structure was established using temperature measurements carried out at various depths during the well-digging process. As far as the other parameters (regarding thickness and other aspects of the nappes) are concerned, they were determined based on the back-stripping analysis and the history of sediment burial, being closely related to the local conditions of the nappes. The results obtained have shown that, for the oil structure studied, the influence of the thrust over the thermal regime was not great enough to be considered a major factor in the generation of hydrocarbons from the source rocks. It was most likely the thickness of the thrust nappe which had an essential role. In other areas, where it was considerably larger, the former may have even played a decisive part.

Keywords: thrust, back-stripping, hydrocarbon source rocks, Șipoteni, thermal regime.