



Effect of convective transport in porous media on the conditions of organic matter maturation and generation of hydrocarbons in trap rocks complexes

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One of the main problems of the study of the intrusion thermal effects on the maturation of the organic matter is to estimate the volume, intensity, thermal effects of the intrusion and its redistribution in porous media by convection. A numerical algorithm for solving the problem of the developed convection in two-dimensional and three-dimensional models of the porous medium depending on the incline angle is developed. It is defined that the convective stability in the medium decreases with increasing incline angle. It was found that depending on the incline angle the structure of convection from many cells for a flat horizontal layer changes and it transfers to more elongated structures along the layer. It is shown that depending on the incline angles, invading sill and imbedding volume of the porous medium it can be realized either stationary or non-stationary convection that provides a principal different thermal conditions of hydrocarbons maturation in the motherboard porous medium. We give numerical examples of the influence of the incline angle on the flow structure inside the porous inclusion. By the stationary convection the volume of the boundary layers between the convective sells increases. That can lead to increasing of the part of motherboard rocks that are outer the temperature conditions of oil catalysis and as a consequence to the overestimation of the deposits.