

Geodynamic model of the Pricaspian Basin: integration of geophysics and geochemistry

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Pricaspian Basin is a great subsidence structure and the most important feature of it is the high position of the mantle surface in the central part of the Basin. Geochemical models of metamorphic processes near the lithosphere-asthenosphere boundary take into account subsiding the carbonate and sulfate formations to the high temperature zone and phase transition of hydrocarbon systems.

Examination of electrical conductivity of the crust and mantle in the Pricaspian Basin shows two main layers with high conductivity: the upper layer (10-15 km) and lower layer (70-80 km in the inner part of the basin and 100-110 km in the outer part of the basin). These layers correspond to low P- and S wave velocity layers. The Basin is characterized by increasing heat flow in the central part.

Mantle uplift and fluid unbounding are the main reason of the consolidated section thinning and subsiding. Subsidence formed dilatancy zones along the perimeter of structure. Lithosphere-Asthenosphere boundary is a zone with the fluid generation and rising this surface activates this process. Taking into account these data, we presuppose the occurrence of more permeable zones on the contacts: "sedimentary section-crust" and "crust-mantle".