



## **Seismicity and Oil Gas Bearing on the Three-Dimensional Model of Lesser Caucasus Earth Crust**

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Lesser Caucasus is located in the northern-eastern part of Anatolia-Caucasus-Iran region. The peculiar feature of the Earth crust is the complicated tectonic structure: availability of deep faults and ophiolite belts, seismicity, volcanism etc. Many facts had been obtained through complex geological and geophysical investigations provided in recent years. However, some problems, concerning of seismotectonics and oil-gas bearing of the region, in general, remain arguing yet.

Comparing the maps of seismic zonation, location of the ophiolite belts and petrophysical section, three-dimensional model of the Earth crust of the territory of Armenia has been created. The full coincidence of both most seismic hazardous zones ( $M= 7.0-7,5$ ) and both ophiolite belts with deep faults is noted.

According to the model of Earth crust evolution the ophiolite belts are formed due to permanent protrusive intrusion of serpentinized masses from the foot of the crust (35-50km) into upper horizons. It is natural to assume, that the permanent intrusion of serpentinized masses through deep faults has drastically occurred accompanying with seismic shakings. This process encourages the development of deep faults, partial dehydration of serpentinized mass, which provoke also formation of magmatic and seismic centers. Experiments at high termobaric conditions show, that some minerals undergone polymorphous transformations, accompanied with phase change and drastic change of rocks volume. Particularly plastic calcite, included in the composition of metamorphic rocks to run into the cracks expands and diversifies them. The process described cause some general effects similar to those of the process of dila-

tancy. Therefore, the protrusive intrusion of serpentized masses into upper horizons, its dehydrations and polymorphous transformations, may be caused by geo-dynamic processes at different depths of Earth's crust. It may be assumed that these processes permanently occur nowadays as well.

Allowing results of oil and gas explorations, obtained in last decades in the territory of Armenia (presence of hydrocarbons of non-industrial value in many regions, including gas and oil in the different wells) and new geological-geophysical data, we offered the new approaches of oil and gas explorations on the territory of Armenia. Results of geophysical studies have revealed heterogeneity of Earth's crust of Lesser Caucasus. The layers with low and high velocities are fixed on different depths. According to the model of evolution of Earth's crust, the genesis of hydrocarbons on the territory of Armenia may be taken by two ways: because of metamorphization of sedimentary rocks, (traditional method of hydrocarbon genesis by organic way), and because of dehydration of serpentized rocks in more depths of Earth's crust (inorganic genesis of hydrocarbons). During the seismotectonic processes these components, in mixed state, by plutonic faults migrated to the upper horizons and accumulated in the layers which have collector properties (high plasticity layers with low seismic waves on depths 5.0-13.0 km in the territory of Armenia).

There are many analog territories on tectonics and evolution of Earth's crust in the Anatolian-Caucasian-Iran region. We consider the obtained results for other regions, to resolve analog problems.