



## **Protrusive intrusion, dehydration and polymorphism in minerals as possible reason of seismic activity, relation between ophiolite belts and seismic zonation of the territory of Armenia**

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In the basis of multiple geological and geophysical data, also on the results of investigations seismic and density properties of rocks at high termobaric conditions, we proposed the petrophysical section and model of evolution of Earth crust of the territory of Armenia.

On the proposed model the following interrelated problems are debated: forming of ophiolite belts and volcanic centers, genesis of hydrocarbons by organic and inorganic ways, and also reasons of originating of seismic centers. The reasons of originating of seismic centers in different depths of Earth crust, are miscellaneous.

According to the model of Earth crust evolution the ophiolite belts are formed due to permanent protrusive intrusion of serpentized masses from the foot of the crust (35-50km) into upper horizons. It is natural to assume, that the permanent intrusion of serpentized masses through deep faults has drastically occurred accompanying with seismic shakings. This process encourages the development of deep faults.

The protrusive intrusion of serpentized masses accompanied with partial dehydration of serpentinites and serpentized ultrabasites and new mineral formation. The processes was accompanied also with drastic change of seismic waves and volumes up to 30%.

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 expends and diversifies them. The process described cause some general effects similar to those of the process of dilatancy.

Therefore, the protrusive intrusion of serpentized masses into upper horizons, it dehydrations and polymorphous transformations in different minerals, may be cause of geo-dynamic processes at different depths of Earth crust. It may be assumed, that those processes permanently occur nowadays as well.

Comparing the maps of seismic zonation, location of the ophiolite belts and petrophysical section three-dimensional model of the Earth crust 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.

Comparing the results of research at high temperatures and pressures, and seismological data may somewhat highlight the formation of earthquake sources at deep horizons of the crust in the territory of Armenia. In ophiolite belts the earthquake sources up to depth of 35km (roof of serpentized layer) may be caused by permanent protrusive intrusion of serpentized masses and their dehydration. In other regions of Armenia especially in the central flexur the earthquake sources located at the depth of 10-20km may be triggered by polymorphous transformations in minerals. Therefore, there is the possibility of earthquake source physics definition which understanding may allow to bring nearer the solution of earthquake prediction problem.