Geophysical Research Abstracts, Vol. 8, 00425, 2006
SRef-ID: 1607-7962/gra/EGU06-A-00425

Northwestern part of the Tethyan region (the Karkinit Basin of the Black Sea)

K. Kleshev (1), **I. Balanyuk** (2), T. Akivis (2)

(1) All-Russian Research Institute of Oil Geology (VNIGNI), Moscow, Russia, (2) P.P.Shirshov Institute of Oceanology RAS, Moscow, Russia

(akivis@geo.sio.rssi.ru / Fax: +7-095-1245983)

Kinematics of plate movement in the Black Sea–Caucasus region is determined by convergence of the Arabian and Eurasian plates with the velocity of about 30 mm/year. The area of the maximum compression including the Great and Lesser Caucasus and East Anatolia is located just opposite the edge of the Arabian plate. In this area, considerable horizontal decrease of the Earth's crust is expressed in the form of reversed faults and nappes in the Great Caucasus and Transcaucasian areas and in the form of side extrusion of blocks in the East Anatolia and northwestern Iran. So, the East Anatolian subplate is extruded to the west from the zone of maximum compression while the other blocks move to the east in the direction of the South Caspian Basin.

The blocks or subplates of the eastern part of the Black Sea move to the northeast. This is important for estimation of seismic and connected geological hazards in the studied region. It was established that deformations and seismicity are mainly confined to the edges of the East Black Sea subplate while in its inner part the level of seismic activity is considerably lower.

In the West Black Sea Basin, seismicity is confined to the front of Balkanid-Pontid while the northern and northwestern passive margins are slightly static or aseismic that demonstrates the calm current tectonic regime. The West Black Sea Basin includes about 50 thousand $km^2$of shelf belonging mainly to the Ukraine water area. The sea depth over the majority of shelf does not exceed 100 m. The Odessa Bay is a confirmed province of gas bursts with one exploited deposit and six deposits in the stage of preparation to exploitation or development. The total surveyed gas resources comprise 1.5 trillion m^3.

Gas bursts take place within the continental slope of the West Basin. The basin filled by Cenozoic sediments more than 14 km thick is located south of the slope. Judging from results of deep seismic profiling, they are overlay the basaltic basement, and only in the foot of the continental slope Mesozoic (Cretaceous?) deposits are distinguished.

Within the continental slope having fault structure, pinching out of the lower horizons and thinning of the upper horizons of Cenozoic layer take place. Minimum thickness of Cenozoic deposits reaches within the Kalamitsk Rise extending parallel with the brow of the continental slope. The Karkinit Basin is located north of the rise. It is filled by a tick layer of Cretaceous–Cenozoic deposits. Formation of the basin began by formation of Albian and Aptian–Albian rift system filled by clay-sandy synrift deposits with thickness up to 1-2 km. In the Cretaceous—Paleogene, the wide basin was formed as a result of post-rift subsidence. It was filled by sediments with thickness up to 4 km.

In the end of the Eocene, the basin underwent slight inversion accompanied by formation of reversed faults, probably, along the plains of previous normal faults. Reversed faults and conjugate anticlines are developed on the both slopes of the Kalamitsk Rise, likely, underwent uplift during the period of compression. Some reversed faults were active in the later periods as well up to the Pliocene.

The Karkinitsk Basin includes several gas deposits with total explored recourses of 1.5 trillion m^3. Reservoirs are confined to coarse-grained sandstone of the Aptian, Pliocene, and Oligocene overlaid by marl of the Upper Cretaceous and Eocene and clay of the Oligocene. The main type of traps is anticlines formed during the Late Eocene and later phases of compression.