Geophysical Research Abstracts
Vol. 14, EGU2012-12144, 2012
EGU General Assembly 2012

Subsurface deposition: abnormal energetics of the activity discharges and the formation of hydrocarbon accumulations

B. Valyaev
(valyb@mail.ru)

Abnormal high pore pressure (overpressure) was fixed and has been studied for more than half a century. The compression, consolidation and the catagenesis of depositions with the increase of the depth are regarded as the main factor of their formation and origin. The intensification of hydrocarbon generation and the difficulty of their outflow to up the geological section produce abnormal high pore pressure (AHPP) in the forming hydrocarbon accumulations at large depths. At large depths pore fluids obtain not only lithostatic (geostatic) pressure but also tectonic stresses. This mechanism forms not only increased, but also extreme high pore pressures (EHPP) – by close to geostatic and even over geostatic pressures at the depths more than 4-7 km.
The EHPP of this type are characteristic for the mud volcano activity. The origin of the EHPP in the mud volcano channels is clear and is related with hydrocarbon discharges (mainly methane) from deep accumulations (volumes). For the mud volcanoes on the land deep origin of their erupting gases has been confirmed by the synchronous seismicity and by the explosive eruptions. The activity of this type is possible only if there is the constant contemporary inflow of the deep hydrocarbon accumulations with which the volumes of the mud volcano activity are related.
However EHPP turned out to be widespread also in the hydrocarbon accumulations at small depths close to the surface or near the sea bottom. At the subsurface the formation and the preservation of the EHPP at the subsurface hydrocarbon accumulations at the expense of geostatic or tectonic stresses is impossible. The origin of the EHPP at the subsurface depositions may be connected only with the most intensive discharges of deep hydrocarbon fluids. This explanation is conformed not only to the localization of the distribution of hydrocarbon accumulations and the discharges in the subsurface situation but also to their spatial combination.
The abnormal energetic of intensivity discharges is the key for the understanding of the mechanism of their activity and also for the understanding of the mechanisms of the formation of subsurface hydrocarbon accumulations, including gas hydrate accumulations.