



Potential of gas and oil shale resources in Kazakhstan: Geological, geophysical and petrophysical aspects

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Problem of energy supply is one of the very important concerns in the world. The inevitable dependence of the industrialized world on energy requires the sustainable development of energy sources. Gas and oil shales appear to be one of the potentially most significant sources of alternative energy. At present, the natural gas industry is focusing mainly in producing gas from conventional reservoirs and has yet to turn its full attention to unconventional gas reservoirs. Gas shale reservoirs represent a vast, long-term, global source of natural gas and require to be studied in a systematic way. Many discoveries and developments are now taking place in the USA, Asia, Europe, Middle East and Africa.

The main barriers in gas and oil shale development are the lack of information about the potential of oil and gas shale resources across of Kazakhstan territory, clear understanding of geological structures, their petrophysical properties and precise estimation of gas and oil shale reserves. The main results of the present studies are geological and geophysical characterization of the gas and oil shale formations, identification of rock composition and its petrophysical properties and evaluation of the gas and shale reserves.

The petroleum and the coal-processing industries belong to the most important components in economy of Kazakhstan having considerable coal reserves in coal and shale basins of Karaganda, Maikubensk, Karazhar, Kendyrlyk and others. Kazakhstan coalbed methane reserves estimated at 1.2- 1.7 trillion m³. Oil and gas shale were mainly formed in small lakes and are associated also with coal-bearing rocks including the thick and extensive rocks of the Late Carboniferous age that we studied and mapped.

According to the successful experimentation that was carried out earlier using Kazakhstan's oil shale at the beginning of the 1960th it was found that the shale oil had a low sulphur content for the production of high-quality liquid fuels. Research shows that the occurrence of oil and gas shale is significant. The most important deposits have been identified in the western (the Urals group) and the eastern (the Kendyrlyk field) Kazakhstan. Hydrocarbon resources in place from shales in Kazakhstan have been estimated to be in a region of 2.8 billion barrels. Moreover, many of the deposits occur in conjunction with hard and brown coal accumulations (Kendyrlyk field) which, if simultaneously mined, could increase the profitability of the coal production industry whilst helping to establish a shale-processing industry.