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Resources of Natural Gas in Shallow Permafrost Accumulations of Relict (Self-Preserved) Gas Hydrates in Russia

Relict (self-preserved) gas hydrates situated in permafrost at depths 2-250 m often are in association with local accumulations of free gas. These accumulations could be the result of partial decomposition of relict hydrates with time. Free gas accumulations in shallow permafrost have been encountered in many regions of Russia in the course of drilling and coring of permafrost intervals. Free gas liberations from permafrost intervals were documented for oil/gas bearing regions as well as non-hydrocarbon regions. Methane was the dominant component in these accumulations in both types of regions. This means, that methane in relict hydrates could be local, microbial. Detail study of isotopic composition of permafrost gas in Yamal peninsula (West Siberia) has confirmed, that permafrost gas is completely different from thermogenic gas in productive reservoirs situated below permafrost. Gas resources in relict hydrates and associated free gas accumulations are dependent on organic matter content and the degree of its processing. Thus, there is an opportunity to estimate total gas resources in relic hydrates and associated free gas accumulations taking into account total area of organic-enriched permafrost sediments spreading in Russia and average specific hydrate/gas content of permafrost according to the measurements made in Yamal peninsula. Average specific gas resource density at Yamal peninsula was about 2,5 mln m3/km2. Total area favorable for relict hydrate existence in Russia is about 6 mln km2. So total gas resources in permafrost relict hydrates and associated free gas accumulations could achieve 15 TCM.