

## **OIL AND GAS IN BASEMENT RESERVOIRS OF WESTERN SIBERIA**

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Western Siberia is one of many World's regions with oil and gas accumulations in the basement reservoirs. Different hydrocarbon flows from wells were obtained on 49 fields here. Only one-third of the fields are being considered as commercial. A major difficulty is in low recovery efficiencies due to the geologic and petrophysical heterogeneity of the basement reservoirs. These reservoirs were formed below a regional epihercynian unconformity during long periods of weathering and erosion of the igneous and metamorphic rocks. Two principal reservoir types may be distinguished. The first includes areas of weathering residues and the second comprises faulted fissured igneous and metamorphic rocks. Only secondary carbonate basement reservoirs are productive. These reservoirs are commonly considered as homogeneous sedimentary rocks with reefs and other perspective structures. However, studies of tectonic and regional facies of the Paleozoic rocks based on cores, well logs, 2D and 3D seismic data have demonstrated that significant reservoirs resulted from karst modification of the compact and folded carbonate units. Carbonates had been dissolved by atmospheric water during a surface weathering so that karst cave system and cavern porosity were formed. The karst facies are (1) autochthonous carbonate collapse breccias, (2) autochthonous non-dissolved residues (red clay and chalcedony), (3) allochthonous sedimentary deposits (clay, silty sandstone, more seldom peat thin intercalations). Exploration and recovery programs in these reservoirs can be optimized by means of the karst model which can predict their heterogeneity.