



Bacterial forms of pyrite in clayey oil reservoirs in the northern regions of the West Siberian Province

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The reservoirs of the northern regions of the West Siberian Province are characterised by high clay content, which inhibits the filtration of hydrocarbon systems in them. This leads to the development of specific mineral forms produced by nanobacteria. These evolve due to the absorption of sulphate compounds from the reservoir-filling fluid. Sulphate-reducing bacteria build their external framework out of pyrite crystals. In the process, the sulphate-reducing bacteria form colonies. These produce both finely dispersed, isolated pyrite crystals in pore channels and framboidal pyrite in the form of raspberry-like aggregates. In some cases, bacterial forms of pyrite are represented by octahedral and pentagonal-dodecahedral crystals that are characteristic of high-energy crystallisation. There are also framboids made up of cubic crystals. These forms have been proven to be of microbiological origin through the study of the internal structure of microcrystals in polished sections. They feature rounded, ovaloid, highly porous cores of such crystals.

The study of such forms of pyrite in clayey oil-bearing strata has revealed the ongoing evolution of oil deposits governed by filtration processes in oil reservoirs.