

Diagenetic changes of sandstone reservoir of Ashalchinskoye bitumen deposit

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Abstract

Ashalchinskoye bitumen deposit is located at a depth of 80-200 m under the surface and use as an example of upward inversion of oilwater fluids. In tectonic terms, it is confined to the regional fault zone, complicating the western slope of the South Tatar arch. Bitumen saturated reservoirs are located in polymictic sandstones of Sheshminsky horizon Ufimian stage of middle Permian. Study of reservoir sandstones are showed that the formation of bitumen saturated layers of sandstones was carried out under the influence of carbon dioxide before oil migration. The presence of CO₂ in solution is helped to dissolution and removal calcite from sandstones cement and hydrolysis of fragments effusive rocks folded by albite. As a result of this sandstone has acquired high reservoir properties. Ion-exchange reactions in the system 'acid fluid-rock fragments' are helped to metamorphization of pore solutions, and accompanied by increasing of their alkalinity due to input of sodium ions. This resulted activation to dissolution of alumina, albite and quartz. Products of dissolution later used to formation of analcime and calcedony along periphery of rocks fragments. Following oil migration into prepared reservoir suspended all processes.

Keywords

Bitumen deposit, Dolomitization, Pyritization, Sandstone reservoir, Secondary changes, Zeolitization