

RELATION OF GAMMA-IRRADIATED NA-BENTONITE CLAY MINERALOGY TO ORIGIN OF GUNASHLI PETROLEUM

Petroleum is a product of the diagenesis of fundamental organic compounds in organic matter that accumulated with fine-grained sediment in a low-energy environment deficient in oxygen. The diagenesis takes place during burial, under the influences of heat, time and pressure – probably in the presence of clay catalysts[1]. Contemporary science does not yet know any microbe which really generates n-C₁₁ – n-C₂₂ alkanes, phytan, pristan and aromatic hydrocarbons. In present work was studied the smectite dehydration under gamma rays – its relation to structural development and hydrocarbon accumulation in Gunashli oilfield, Azerbaijan. Radiation – induced damage in Na-bentonite clay caused formation of arenes, cycloparaffines, branched and unsaturated hydrocarbons, namely generation of hydrocarbons from Gunashli oil field [2,3].

It was revealed that the process of destruction of silico-alumina nucleus of clay minerals is becoming more active in a particular sequence of cation out let of crystal lattice: Fe³⁺ > Ca²⁺ > Mg²⁺ > Na⁺ > K⁺ > Si⁴⁺. Except for the destruction of a solid phase of clays, there is radiolysis of pore water, which results in the formation of free radicals. The catalytic conversion of hydrocarbons of petroleum occurring on contact with irradiated solids. The main essence of radiocatalytic processes is transferring the unbalanced charges formed by absorbed ionizing radiation energy on the surface of the catalyst to the system[3,4]. Under the effect of ionizing radiation valence electrons(F) and hole centers(V) form in bentonite clay crystals.

The experimental results discussed in the work[5] confirm that the CaCO₃ - FeO – H₂O system generates the suite of hydrocarbons in characteristic of natural petroleum. Proposed catalyst sodium –bentonite clay (Alpoideposit contains more than 85% of Na- montmorillonite -(Na,0.5Ca)_{0.7}(Al,Mg,Fe)₄(Si,Al)₈O₂₀(OH)₄·XH₂O) consist of complex oxides and water. This research gives a new approach for study the metamorphism of crude oil [6].

References

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Session Classification: Applications of nuclear methods in science and technology