

Screening of Microorganisms Effective To Increase Oil Recovery in the Kazakhstan Oil Fields

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1. Introduction – Kazakhstan is one of the largest oil reserve areas in the world. However, the efficiency of oil recovery from reservoirs with implementing modern technologies and methods in all oil-producing countries to date is not high, resulting in an average oil recovery in different countries and regions between 25-40%. In Kazakhstan, the figures are even lower, because the majority of oil deposits in the region refers to the highly viscous, i.e., hard-to recover [1].

In this regard, the urgent need nowadays is to develop novel technologies and emerging strategies for enhanced oil recovery. It requires looking for cost-effective, reliable and practical ways to liquefaction of the lower pools of oil wells. One such area is biotechnology, which is based on the use of special strains of microorganisms capable of utilizing heavy hydrocarbon oil fraction and producing biosurfactants, reducing surface tension of reservoir oil, thus providing increased access hydrocarbons in microbial cells for subsequent microbial oxidation. It was established that bacterial oxidation of hydrocarbon formation is accompanied by the formation of volatile acids, alcohols, and gases, together with the biosurfactants, which contribute to displace the reservoir oil [2].

2. Results and Discussion We have selected oil-oxidizing and active biosurfactant-producing bacteria among microorganisms isolated from the sludge deposits in Western Kazakhstan. Thirty-three oil-destroyer strains of microorganisms were screened, of which fourteen showed the index of the emulsification of oil above 50%. These strains were used in experiments to create a biotechnological method for increasing oil recovery from oil reservoirs.

3. Conclusions - The results indicate that the hydrocarbon-oxidizing microorganisms, possessing a wide spectrum of biological action, may serve as a basis for development effective ways to improve the recovery of oil.

4. References

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