Prediction of Microbial Enhanced Oil Recovery using an Artificial Intelligence Method based on Experimental Data

Abstract

Enhanced oil recovery (EOR) process may be used to recover additional oil left in place after primary recovery. The prediction of its performance is of great importance in the selection and design of a certain EOR process, and also within planning of oil production. In this paper, in order to study the ability of four specific microorganisms consisting of pseudomonas aeruginosa, bacillus subtilis, bacillus licheniformis and clostridium acetobutyllicium for enhanced oil recovery over 5 Iranian reservoirs, a model of artificial neural network (ANN) has been built by using of 83 Laboratory data with valid reference. Each one of these data consists of six parameters including porosity, permeability, pressure, temperature, salinity and PH which have been devoted to network as inputs. Also, the related oil recovery of each data which has gained base on the effects of utilized microorganism and six parameters has used as output. After that, this model base on four microorganisms has been used for predicting oil recovery percent of five different reservoirs, whereas the property of these new reservoirs entered as our new inputs. The result of our study showed the ability of bacillus subtilis in comparison with other three microorganisms over these five reservoirs on account of its comparatively high oil recovery percent that varies between 37. 7- 50. 3 for different reservoirs.
References

Index Terms

Computer Science

Artificial Intelligence

Keywords

Enhanced Oil Recovery  Microbial  bacillus subtilis  neural network