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A Smart Idea for Green Water Flooding of Oil Reservoirs at High Salinity and High Temperature

Omar Chaalal* and **Hameed Mohamad**
Chemical Engineering Department, Abu Dhabi University, UAE

Oil formations contain water having high salinity and/or high concentrations of divalent ions such as calcium or magnesium dissolved therein, and are additionally at temperature high temperatures. Most of the available surfactants used in oil recovery operations are either ineffective in high salinity or high hardness waters, or incapable to stand the higher temperatures encountered in many formations. A powerful natural product that improves enhance oil reservoirs recovery through the reduction of interfacial tension and increases the volumetric sweep efficiency of fractured and /or heterogeneous oil reservoirs is introduced in this invention. The novel green surfactant for EOR is extracted from Z.S.C plant and AL.VE plant. This natural agent proves to be very effective in formations containing water whose salinity is from 70,000 to 180,000 parts per million total dissolved solids and also having temperatures as high as 100° C. The agent is mixed with the formation water and is stable over a wide range of formation temperatures and water salinities and hardness values.

Biography:

Omar Chaalal is an Associate Professor of Chemical Engineering at Abu Dhabi University (ADU). Chaalal is an internationally renowned expert in the separation technologies. He is the inventor of the EnPro Process that deals with the sequestration of carbon dioxide and global warming reduction. He has undertaken several successful researches related to CO2 cleaning in Natural Gas and subsequently two patents applications have been filed for the use of this technology. The benefits of these patents were, in addition to the environmental benefits, used in the treatment of large quantities of desalinated formation water in the oil field. Chaalal has pioneered among others the use of seawater and ammonia to reduce the effect of carbon dioxide on the environment.

Chaalal was an associate professor of Chemical Engineering at Ibn Khaldun University Algeria, as well as at the United Arab Emirates University. He was the Chief Scientist of Enpro As. Norway, a member of Al Mobdioon Center of Excellence and innovation of King Abdul Aziz University (Saudi Arabia), an Advisory Board of IIB environmental Company in Japan and a member of the board of the Journal of Nature Science and Sustainable Technology (Nova Science Publisher). He has authored 50 refereed publications, 2 European patents, 1 US patent pending and 200 presentations.