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Industrial application of the pre-oxidation for improving thermodynamic stability of an oilfield produced water

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Abstract

Oilfield produced water (OPW) was generally treated with some equipment, such as settling tank, hydrocyclone, flotation and filtration, and injected into oil reservoirs for waterflooding in traditional technology, in which suspended solids (SS) which had existed in OPW were only focused on, but the possibility of SS formation was not paid attention to. The thermodynamic stability of the treated OPW was inferior. Even though the quality of OPW treated freshly could meet the requirements of the injection water standards, but the SS level would be escalated during the transportation to injection wells. The level of OPW in injection wells was higher than that of the standards, which would cause formation damage of low permeable oil reservoirs. SS which had existed in OPW were not only removed, but also the possibility of SS formation was eliminated in the technology we developed. Firstly, OPW from three phase separators was oxidized by electrochemical equipment or oxidizing agent. Secondly, the ion composition of oxidized OPW was adjusted with chemicals to get rid of the possibility of SS formation. Thirdly, OPW was flocculated and subsided in a settling tank, and that the precipitates at the bottom of the tank were discharged as sludge by the system of discharging sludge. Last, OPW was filtrated with silica sand filters. The thermodynamic stability of OPW treated in my technology was obviously improved. The level of treated OPW increased hardly during the transportation to injection well, was lower than that of the standard.

Biography

GeXin You, Ph.D, works for South China University of University (SCUT), is an inventor about the treatment of oilfield produced water to inject into oil reservoirs with electrochemistry, good at treatment of oilfield produced water for waterflooding, has published more than 50 papers in Chinese and English journals.