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Laboratory evaluation of cyclic CO, injection for shale oil reservoirs

James Sheng and Talal Gamadi Texas Tech University, USA

The low recovery and very high oil volume remaining in shale reservoirs are a strong inspiration to investigate the application of enhanced oil recovery methods in shale oil reservoirs. Latest numerical studies have revealed that huff-n-puff method could be an effective method to increase recovery factors in shale oil reservoirs. Very limited data are available on the performance of CO_2 huff-n-puff for shale oil reservoirs. In order to show the efficiency of huff-n-puff technique, a laboratory work was conducted using cores from Barnett, Mancos and Eagle Ford to evaluate the potential of cyclic CO_2 injection. Many design parameters such as soaking period, number of cycles, and injection pressure were considered to evaluate the feasibility of CO_2 cycle injection. Cores were fractured because fractures provide a large contact area for the injected CO_2 to penetrate and diffuse through the low permeability matrix.

Laboratory results indicated that cyclic CO_2 injection improved recovery of shale oil cores from 10 to 35% depending on injection pressure and number of cycles. Our earlier work has shown that such cyclic gas injection is a promising method. The purpose of this study was to develop a better understanding of the performance of cyclic CO_2 in shale oil reservoirs.

Biography

James Sheng is an Associate Professor in the petroleum department of Texas Tech University. He holds a Ph.D. degree from University of Alberta. He received several professional awards including the Outstanding Technical Editor Award (2005) and Outstanding Associate Editor Award (2008) for SPEREE, and the Best Paper Award in JCPT (1997). He is an author of many papers and a book of Chemical Enhanced Oil Recovery. Faizan Nasir was a Master student at Texas Tech University.

james.sheng@ttu.edu