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Experimental Study of Heavy Oil Displacement by Hot Water in Porous Media ABDULLAH ALAJMI, RIDHA GHARBI, MESHAL ALGHARAIB, Kuwait University — The injection of one fluid to displace another in a porous medium is the basis of many industrial processes such as Enhanced Oil Recovery (EOR). EOR applications are encouraged by high oil prices and growing oil demand. Therefore, performance prediction of EOR processes is of great importance to their success. Core flooding experiments are well known practices in the petroleum industry that provide economical means of determining the responses of reservoir rock and fluids to the driving mechanism responsible for production. Lab experiments provide both insight into the behavior of fluid displacements and data with which to test and calibrate numerical simulators. In this study, laboratory experiments were conducted in order to test the effectiveness of hot water injection to displace heavy oil from a given porous medium. The objective was to find the optimum design parameters in terms of injection temperature and hot water slug size that will yield the best performance. Analysis of these experiments has revealed the functional relationships between the scaling groups describing the displacement and the oil recovery obtained from such displacement. Results obtained from several design configurations are presented. These relationships can be used as a tool for the design of hot water injection to recover heavy oil. They also provide conditions under which a given design may yield better recovery performance.

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