The College of Graduate Studies and the College of Engineering Cordially Invite You to

Master Thesis Defense

Entitled

OPTIMIZATION OF LOW SALINITY WATER FLOODING IN LOW PERMEABILITY OIL RESERVOIR

by

LI YANG

Faculty Advisor

Dr. Abdulrazag Y. Zekri, Chemical and Petroleum Engineering Department

College of Engineering

Date & Venue

01:00 PM

Tuesday, 07 May 2019

Room 1004, F1 Building

Abstract

In recent decades, the demand of energy is growing sharply. Oil is a type of energy resource; it plays a very important role among all the energy resources. However, to get more recovery of oil becomes more and more difficult. Carbonated Water Flooding (CWF) is selected for possible use in improving the oil recovery in this project. Although wettability always been considered as the major mechanism that will increase recovery, there still need more study to investigate the effect of others mechanism. The primary aim of this study is to investigate optimize the oil recovery of low permeability carbonate reservoir employing different carbonated brines. Formation brine (17500ppm), carbonate formation brine, sea water, low salinity water carbonated sea water (50000 ppm),and carbonated low salinity (5000ppm) brine were used in this work. Core samples were grouped as composite core with similar reservoir permeability. Different sequences of brines were employed to determine the optimum system. The experiments show that Carbonated Water performs better than the normal water the best series of brine, which will give the largest oil recovery (69.04%). Core flooding results indicated that Carbonated Low Salinity water is the best brine among all tested brines. The IFT Contact angle, and end point relative permeability results indicated that wettability is the dominant mechanism of the studied systems. A sequential composite core flooding consist of car LSW- LSW-.SW is the optimum flooding system among the studied systems.

Keywords: Low Permeability Reservoir, Core Flooding, LSWF, CWF, Carbonated LSW IFT, Contact Angle.