Sudan University of Science and Technology

College of Petroleum Engineering and Technology

Petroleum Engineering Department

Graduation project submitted to College of Petroleum Engineering and Technology for partial requirement for B.Sc. degree in Petroleum Engineering

Chemical Huff and Puff Design

(Case Study, Bamboo Oil Field - Sudan)

تصميم طريقة (Huff and Puff) الكيميائية

(دراسة حالة، حقل بامبو النفطي – السودان)

Prepared by:

Ahmed-alnobiEzzeldeen Ahmed

MagdiBalla HamzaAlameen

MohmmedAlmujtaba Mubarak

Mohammed Omer Ibrahim Almadani

Supervisors:

Dr.Tagwa Ahmed Musa

September 2014

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Fatima Ahmed Eltigani

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Dean of college of petroleum engineering & technology

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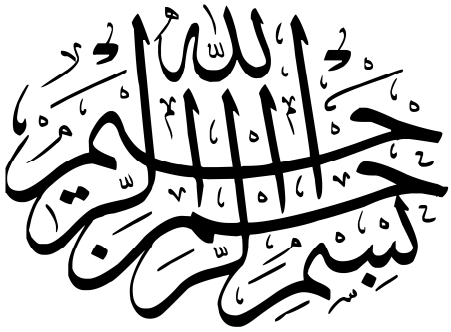

﴿ قُلْ إِنَّ صَلَاتِي وَنُسُكِي وَمَحْيَايَ وَمَمَاتِي لِلَّهِ رَبِّ الْعَالَمِينَ ﴿١٦٢﴾ ﴾

الأنعام: ١٦٢

Say, "Indeed, my prayer, my rites of sacrifice, my living and my dying are for Allah, Lord of the worlds. Holy Qur'an 6:162

Dedication

To our parents, brothers and sisters

Their words of inspiration and encouragement

in pursuit of excellence, still linger on.

Acknowledgment

We are glad to be your student millions thanks to you, as you gave us the strength to continue our work, and you become our guidance in that long way. Without your help our work won't see the light. Your inspiration, direction and funny humor you treat us with when we make stupid mistakes, for all that and more we appreciate everything, and every minute you spent in reading, revising and correcting our work.

Thank you

Dr. TagwaAhmed Musa

Some people work in the dark few people knowing them and their value. They are great asset and the humanity needs more of them. YOU are from them for helping us and waiting for nothing as reward. Without your technical help in CMG software, we won't be here today with this work.

Thank you

Eng. HishamAwadAlseed Ali

At last and not least we want to give our thanks to the college that raise us during those five years. We consider it as home land for us. And how much successful we are in the future, we will not forget from where our success starts.

Thank you

College of Petroleum Engineering & Technology

Abstract

EOR methods are used extensively nowadays for increasing ultimate oil recovery and the effectiveness of each method depends on the characteristics of the reservoir**.**

The target of this study is to determine the optimum parameters for design surfactant concentration, and total volume of water injection.

The study started by collecting data from BB-23well which is located in main Bamboo oil field. Then the data introduced to CMG (computer modeling group) software. The study results shows that the optimum inject rate is 120 m^3/day, the soaking period is 5 days ,the injection duration is 10 days ,the surfactant concentration is 0.1 and the total volume of injected fluid is 1200 m^3.

Key Words:

Reservoir Engineering, EOR, Huff and Puff, Surfactant, Bamboo, CMG.

التجريد

طرق الاستخلاص المحسن تستخدم حاليا على نطاق واسع لزيادة الاستخلاص النفط وكفاءة كل طريقة تعتمد اعتمادا كليا علي خواص المكمن الخاضع لعملية التحسين .

الهدف من هذه الدراسة هو التحديد الأمثل لمتغيرات التصميم لعملية (Huff and Puff)الكيميائية (chemical huff and puff) متضمنة فترة الحقن وزمن إغلاق البئر وتركيز الـ (surfactant) والحجم الكلي للماء المحقون.

الدراسة بدأت بجمع البيانات من البئر-23 الموجود في حقل بامبو الرئيسي ، بعد ذلك تم إدخال البيانات ومعالجتها عن طريق برنامج الـ(CMG) .

أخيرا تم التصميم بناء على اختيار أفضل السيناريوهات لكل متغير. أظهرت النتائج بأن أفضل معدل حقن هو 120 متر مكعب لكل يوم، بفترة نقع 5 أيام، وفترة حقن 10 أيام، ومعدل (surfactant)0.1 ، وحجم محقون كلي للسائل 1200 متر مكعب.

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