

Introduction

Reservoir modeling to assess feasibility of cEOR methods Common approach: studies at small scale ^[1] Numerical simulations Laboratory recovery tests +

+ Insight into mechanisms + Chemical design - Only a few experiments

Need to **improve models robustness** & predictive capacity

- → Focus on surfactant adsorption: highly uncertain, though critical for the process economics

Methodology

Synthetic numerical model

- \rightarrow Water-wet sandstone core ^[2]
- \rightarrow Baseline production data from "Surfactant-Polymer Polymer Brine" floodings

Exp	Size of SP	Surfactant concentration	Salinity gradient SP vs P	Oil recovery
1	0.5 (Pore Volume)	3.5 g/L	-20 %	84 %
2	0.5	3.5	0	57
3	0.3	3.5	-20	52
4	0.5	2	-20	64
5	0.4	3	-20	75

Mechanistic modeling of cEOR w/ OpenFlow[™]



Quantifying the value of information for uncertainty reduction in chemical Enhanced Oil Recovery (cEOR) modeling Sarah LERAY <u>sarah.leray1@gmail.com</u>, C. YEATES, F. DOUARCHE, F. ROGGERO

+ Fast + Systematic sensitivity studies - Model reliability

 \rightarrow Design a consistent set of recovery experiments w/ the most informative observations





Conclusions

Salinity gradient \rightarrow great interest for adsorption characterization and inversion Data not equally informative: + scan (@ end of P) vs - pressure differential Additional 6th experiment w/ intermediate ΔS : necessary to fully constrain the model Successful application of the inverse methodology on a real set of experiments

- [1] Alsofi S. et al., 2013, J. Petrol. Sci. Eng. 111.
- [3] Sheng J. J., 2015, Petroleum 1 (2).

[2] Yadali Jamaloei B., 2015, Energy Sources, Part A: Recovery, Utilization, and Env. Effects 37 (3).