

Adsorption Inhibitors



Description:

Using its Adsorption Inhibitor proprietary technology, The EOR Alliance proposes a novel chemical approach to solve the issue of surfactant adsorption in chemical EOR applications.



Application:

ASP, SP, S flooding in hard brine, sandstone and carbonate reservoirs.



Results:

Adsorption of surfactants has been reduced by up to 70% in a broad set of reservoir conditions, including hard brine, high temperature and in carbonate reservoirs. Chemical EOR becomes economically attractive in a broader set of reservoirs, without water softening and without alkali.

Challenges:

- Surfactants used in chemical EOR formulations tend to adsorb on the reservoir rock, which can result in uneconomical quantities of products required.
- This has traditionally been addressed by the use of alkali such as sodium carbonate in combination with injected water softening.
- However, such treatments can be costly, and unrealistic for high salinity, high hardness injection water, and ineffective in carbonate formations.
- The quantities of alkali required may represent substantial logistical issues in remote or offshore locations.
- In practice, many reservoirs are left outside of the scope of applicability of ASP/SP flooding.

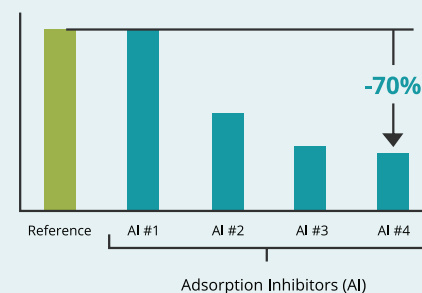
Solutions:

- To relax water specifications in chemical EOR processes.
- To remove the need to build water softening plants.
- To reduce the logistic issues of using alkali.
- To address the specific challenges of surfactant retention in carbonate reservoirs.

Objective:

- To identify the best commercially available adsorption inhibitor in a specific reservoir that will help to reduce the amount of surfactant used in the ASP/SP flooding process to make it economic.

Adsorption of a typical EOR surfactant formulation without and with Adsorption Inhibitors (AI)



Example of increased oil recovery by using adsorption inhibitor (diphasic coreflood experiments results)

| Experiment type | Surfactant | Adsorption Inhibitor | SORc |
|------------------------------------|-----------------|----------------------|------|
| No strategy to mitigate adsorption | 0,6 PV at 8 g/L | No | 29% |
| Adsorption inhibitor strategy | 0,6 PV at 8 g/L | 0,5 PV at 0,25 g/L | 7% |

Reference: SPE164359, SPE174603.

An Alliance between:

