
Contribution ID: **424** Type: **Poster (+) Presentation**

# Glass Micromodels Study of Emulsified Polymer Gel System for Conformance Control Applications

*Tuesday, 1 June 2021 10:00 (1 hour)*

Different techniques were used for water shut off and conformance control in the mature oil fields whose sole purpose is to cut the water production and sweep the oil towards the producing wells. Many different types of gel systems were developed for the conformance control but all of them have the risk associated with them. It is common for the gel systems to not only block the water producing zone, but they also block the oil producing zone. To solve this problem an invert emulsion system with polyacrylamide (polymer) and polyethyleneimine (crosslinker) was developed. The emulsion system breaks into oil phase and gelant phase at high temperature of 105 ℃. The oil phase will provide a path for the oil to flow towards the producing well whereas the gel will prevent the water from flowing towards the production well. To understand this behaviour properly, microfluidic experiments were conducted in this work.
To understand the emulsion separation and conformance control behaviour of developed invert emulsion system, the glass micromodels were used. The developed emulsion was injected into the micromodel and heated at 105 ℃ for emulsion separation and gelation.
After the gelation in the glass micromodels, the injection of water and oil was carried out and the behaviour of water and oil flow was recorded using the microscopic camera. The video graphic analysis presented a unique way in which the developed emulsion systems prevents the water production but allows the oil to flow.
This work for the first time presented the mechanisms which were used by the emulsion system to provide efficient conformance control, the use of micromodel allowed to visually see how the emulsion system allows the oil flow but restricts the water production.

## Time Block Preference

Time Block A (09:00-12:00 CET)

## References

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**Session Classification:** Poster +

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