SONATRACH – PETROLEUM ENGINEERING DIVISION

University of Boumerdes – Hydrocarbons Institute

CO2 geological sequestration:

Leaks control in naturals fissures

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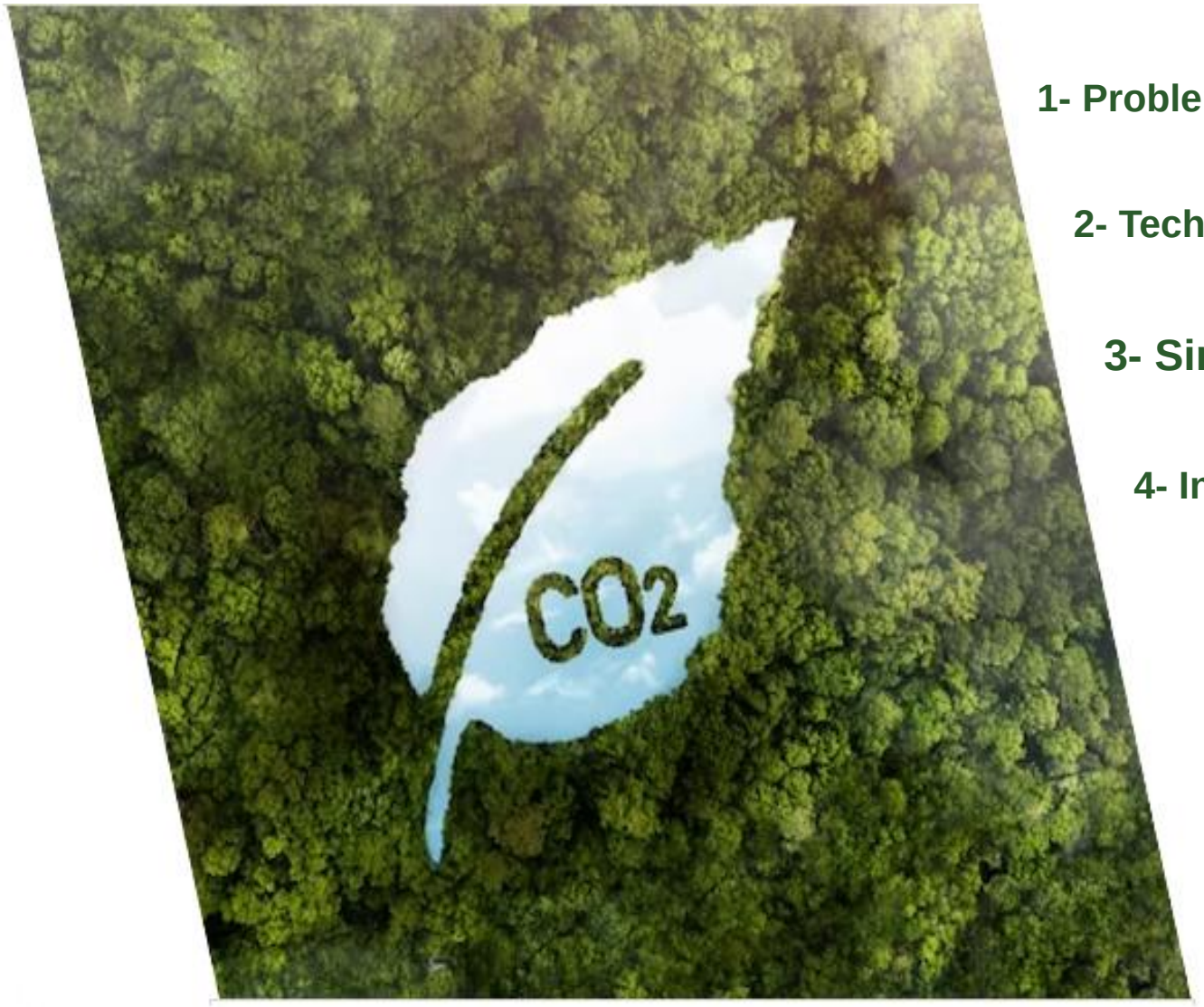
Agenda



1- Problematic, Context & Solution.

2- Technical novelty, Applications & Opportunities

3- Simulations, Experiences & Forecast

4- Initials results & Conclusion

Problematic, Context & Solution

The geostorage of CO2 based on physico-chemical trapping mechanisms should:

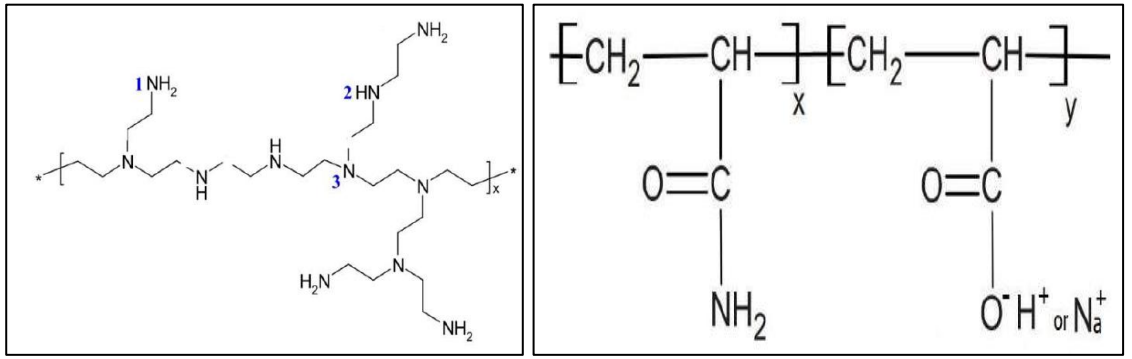
1. Respect strict ability to confine carbon dioxide (CO2).
2. Prevent the post storage effects (Lateral and/or vertical migration of CO2).

The CO2 migration from it storage location can:

- Contaminate the water exploitable resources at shallow depths.
- Infiltrate the soil, and ultimately the possibility to return to the atmosphere with large volumes.

Proposed solution:

To contain the CO2 in the formation, a new application of conformance control is developed with an organic gel PHPA*/PEI** (*Partially Hydrolyzed Poly Acrylamides/**Poly Ethylenimine). The gel permits to seal the most naturals fractures.



Chemical structures of PEI & PHPA

Technical novelty, Applications & Opportunities

Technical novelty:

- The model used is empirical and developed by M. GHERIGA for EOR injection. He successfully got empirically the model of gelling time as a function of the composition of the gel.
- In our team, the objective is to continue the research for an application in CO2 storage.
- The current challenge is to maximize gel effectiveness at storage tank PVT conditions.

Applications & Opportunities:

If this project will have positive results (Laboratory & Simulations), many underground storage opportunities will be opened in the Mediterranean region and the world.

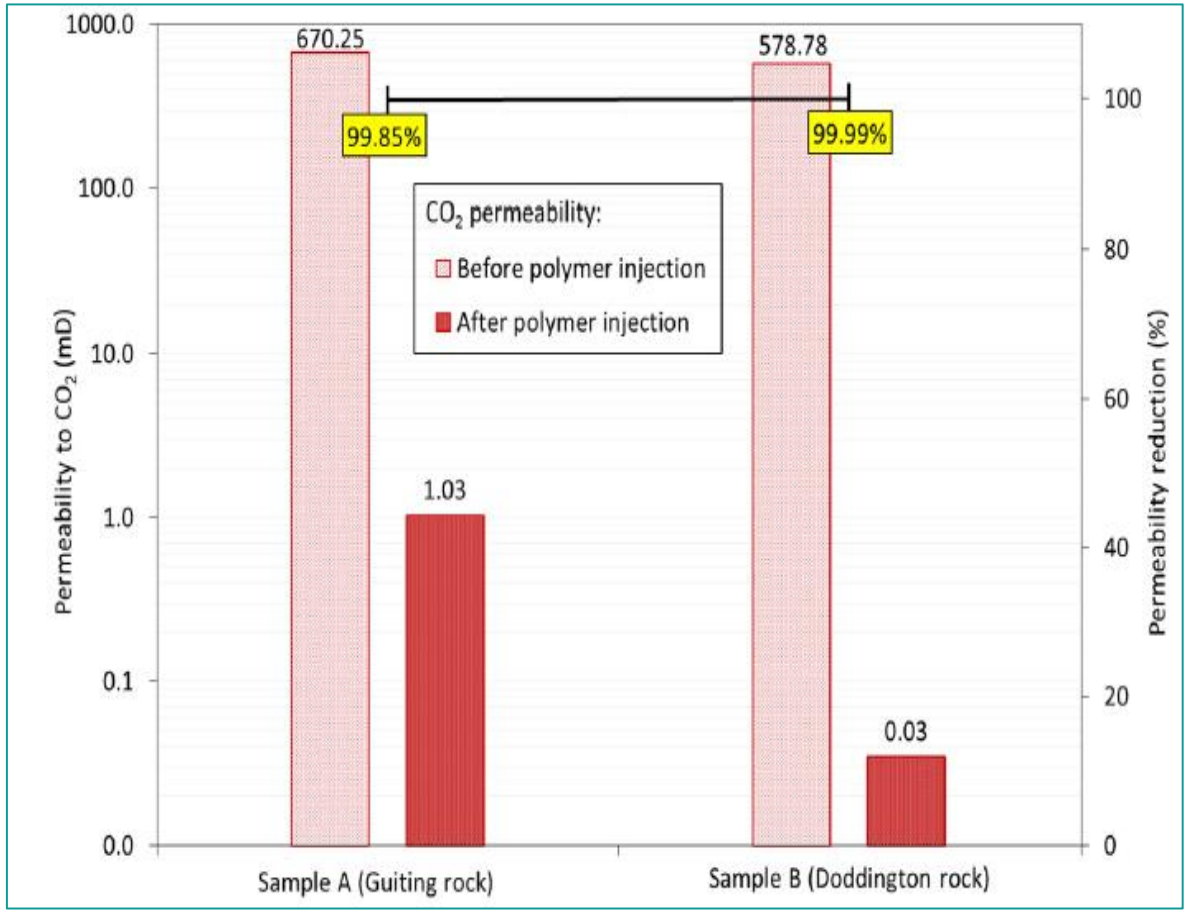


Fig. Effect of gel treatment in reducing permeability for CO2 (Sevket Durucan et al, 2016).

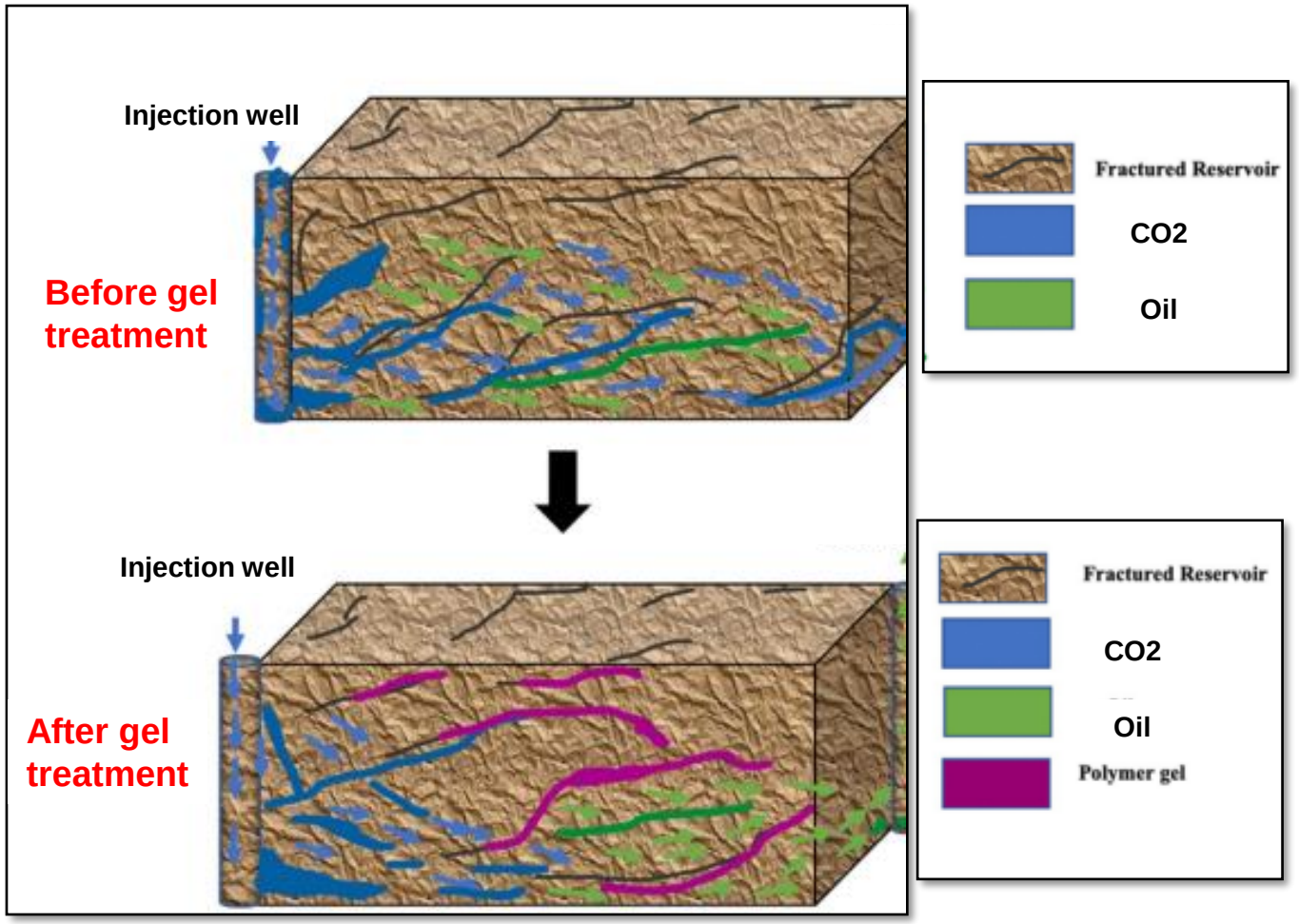
Simulations & Experiences

The model used is empirical and developed by M. GHERIGA. A (All rights reserved).

His research focused on simulations for EOR injection. He successfully got empirically the model of gelling time as a function of the composition of the gel.

In our team, the objective is to continue the research for an application in CO2 storage.

The current challenge is to maximize gel effectiveness at storage tank PVT conditions.



Initials results: gelation time