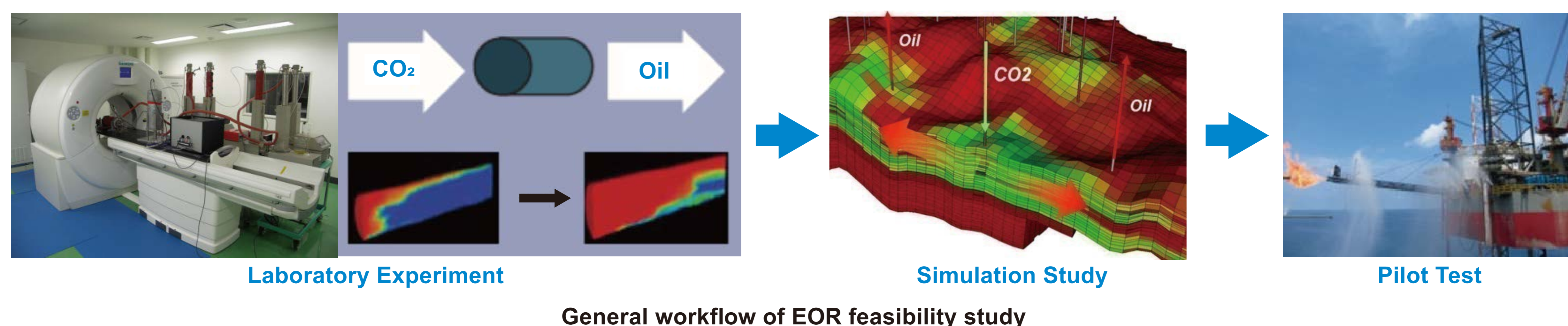


JOGMEC's EOR Activities

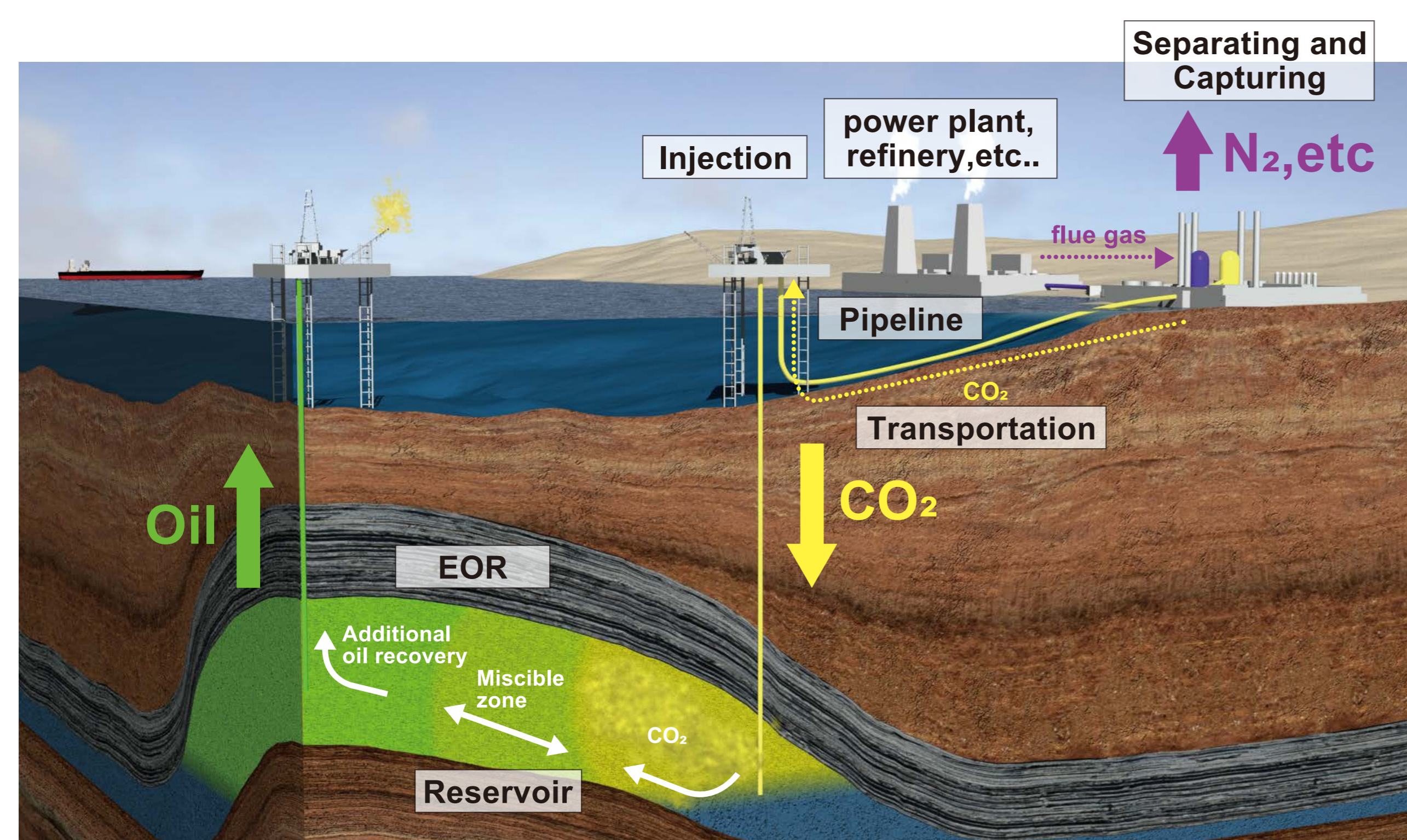
JOGMEC has developed enhanced oil recovery (EOR) technologies and field development optimization technologies to actual fields over 30 years through multidisciplinary integrated studies, including laboratory experiments.

JOGMEC has strong relationship with oil-producing countries through the joint studies.



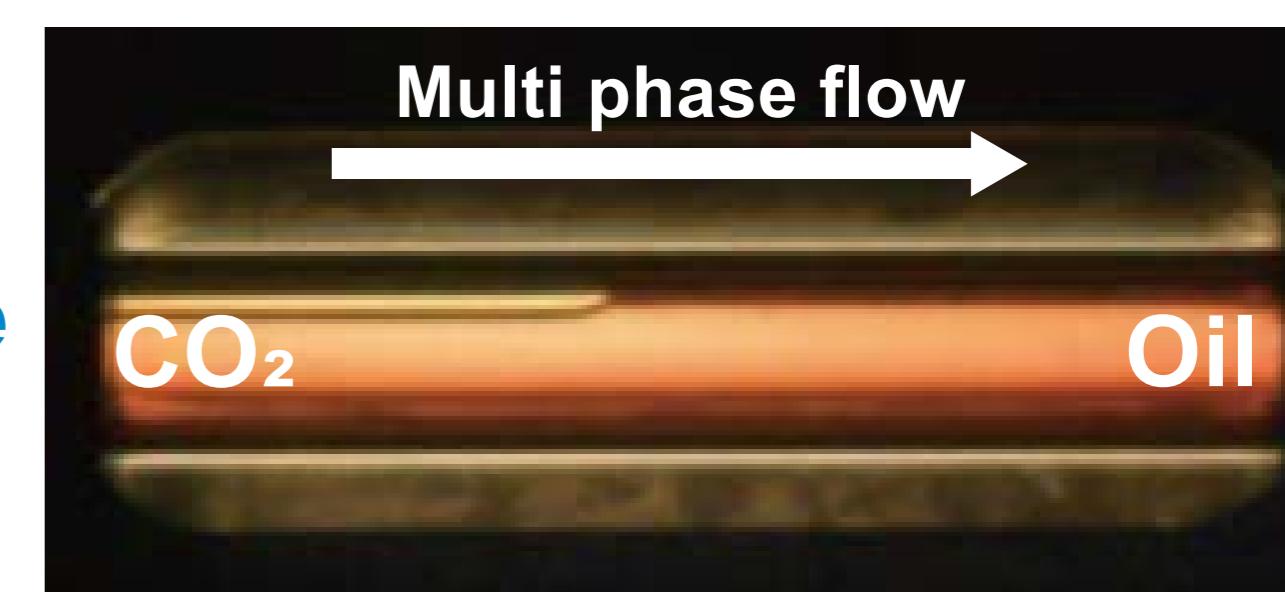
CO₂ EOR

CO₂ achieves miscible conditions with oil, under that condition they mix in all proportions without an interface forming, and improves the sweep efficiency of EOR. JOGMEC focuses on CO₂ as one of promised agents for EOR which contributes to not only higher oil recovery but also environmental protection, and has conducted the joint studies with NOCs.



Conceptual diagram of CO₂-EOR field application

Immiscible



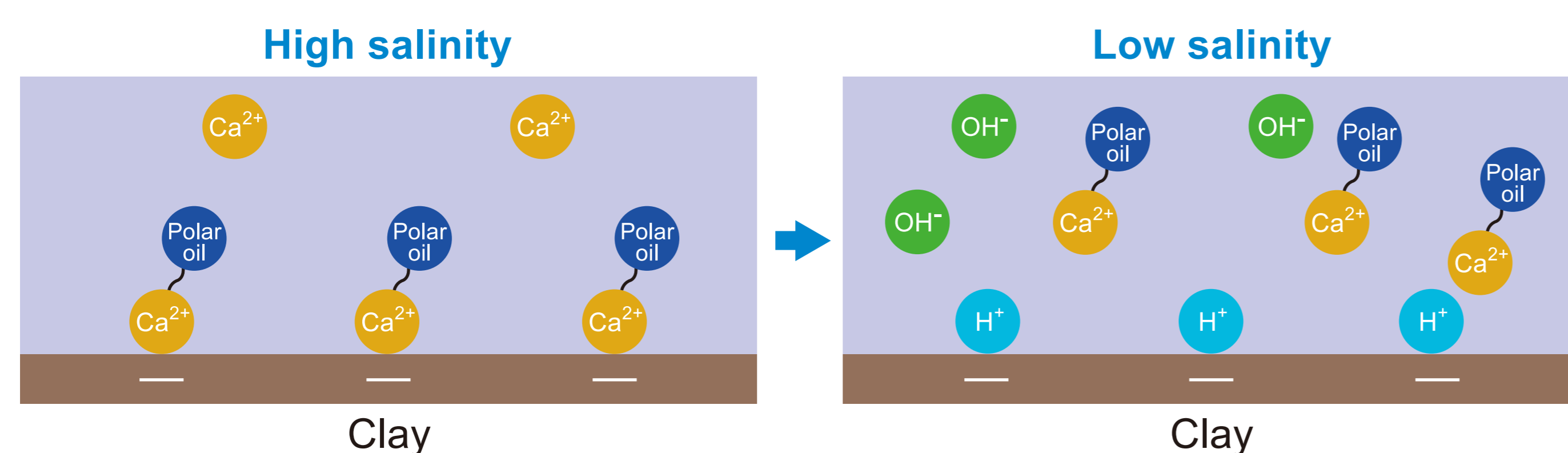
Miscible



Physical difference between immiscible and miscible flooding

Low salinity EOR

It is known that low salinity water increases oil recovery with cost and environmental benefits, but the mechanism is still under investigation. JOGMEC has conducted research of this technology from fundamental laboratory experiments to field applicability evaluation to sandstone reservoirs.



$$\text{Adsorbability: Li}^+ < \text{Na}^+ < \text{K}^+ < \text{Mg}^{2+} < \text{Ca}^{2+} < \text{H}^+$$

Highly probable mechanism of low salinity effect, the MIE theory

Chemical EOR

JOGMEC has been investigating various chemical materials for EOR such as surfactants and polymers.

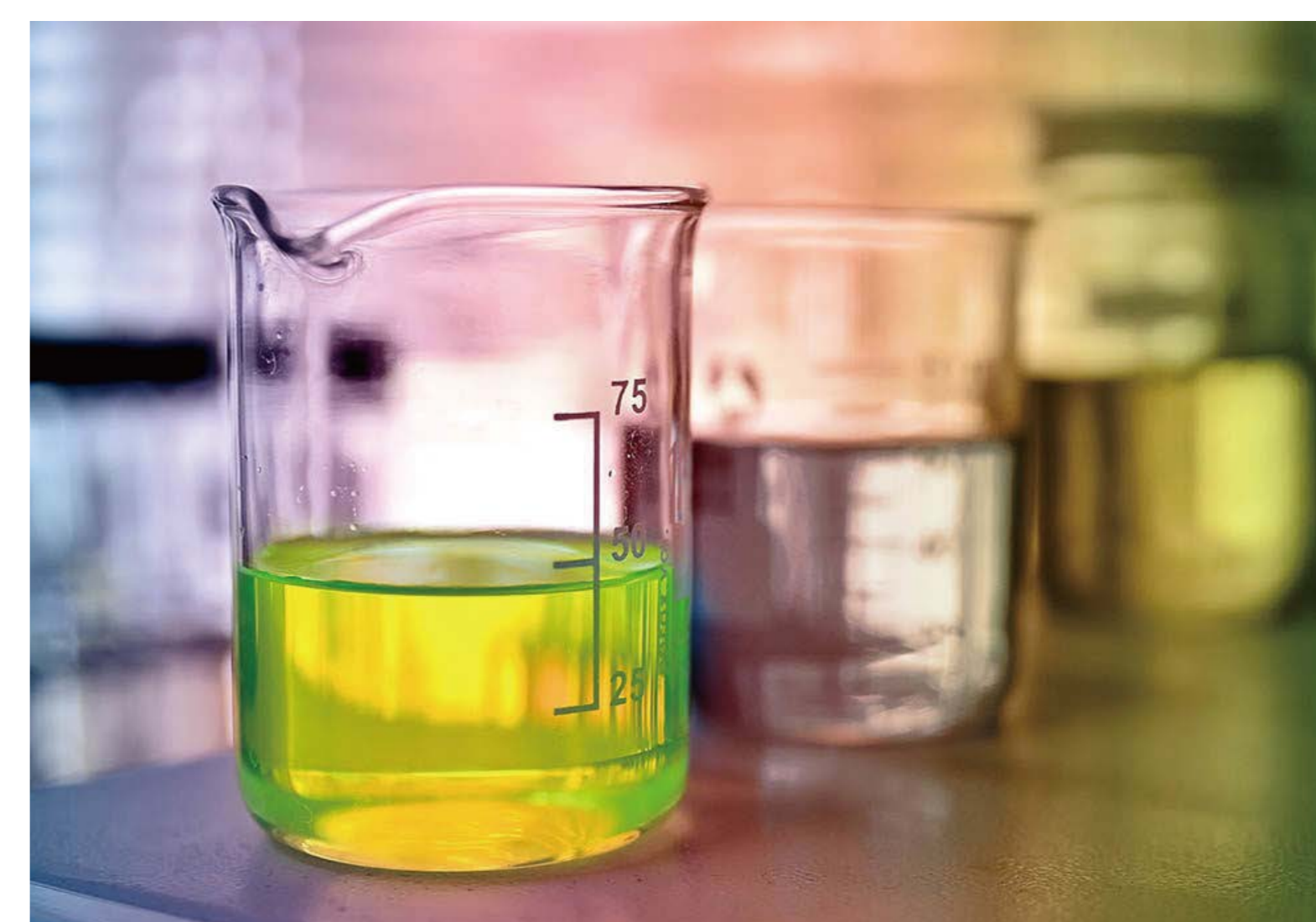


Image of chemical agent (Photo: SPE)