

A study of gas behavior in aquifer and mechanism of residual gas formation

Koji Takahashi[1]; Yasuhiro Yamada[1]; Sumihiko Murata[1]; Masanori Nakano[2]; Toshifumi Matsuoka[3]

[1] Civ. Earth Res. Eng., Kyoto Univ.; [2] JAPEX Research Center; [3] Kyoto Univ

Underground sequestration of CO₂ is recently expected as an effective concept to reduce the green house gas in the atmosphere. Especially, residual gas which is injected one into aquifer and trapped in the pores can be the most effective method to store the gas in reservoir. The purpose of this study is to examine the fundamental mechanism of residual gas formation and gas migration under ground by injecting the gas into a modeled and visualized aquifer.

We used glass beads as porous media to construct some reservoir models that have various permeability layer structures. They were filled with water, then air was injected from the bottom. The air behavior was observed and the distribution and saturation of residual gas were measured.

The experimental results showed that differences of reservoir properties made changes in the gas behavior and residual gas volume. It is also confirmed that air injection rate (injection pressure) was a sensitive property against residual gas volume that can be maximised by selecting a suitable injection rate for each reservoir property.