Contribution ID: **107** Type: **Oral 20 Minutes**

Reduction of Interfacial Instabilities in Miscible Displacements in Subsurface Porous Media

Tuesday, May 15, 2018 2:55 PM (15 minutes)

In the present study, miscible displacements are investigated through nonlinear numerical simulations. A practical scenario with concentration-dependent diffusion and velocity-induced dispersion is considered, which is widely encountered in many areas involving flow and transport in subsurface porous media. Different with most of previous studies with a constant injection rate, the time-dependent displacement rates are used in the present research with the same amount of fluid injected. Under the scenario when dispersion is considered, the cycle period, amplitude and dispersion have a complex effect on the development of interfacial instabilities as well as mixing of two fluids. By varying period and amplitude, the displacements with either more unstable case with higher degree of mixing or less unstable case with larger sweep efficiency and later breakthrough time can be achieved, when compared with the widely used constant injection rate. The time-dependent rates therefore have either destabilizing or stabilizing effects on displacements depending on the values of them. This also indicates that the interfacial instabilities and mixing of miscible displacements can be controlled and optimized with the time-dependent rates.

References

Acceptance of Terms and Conditions

Click here to agree

Author: YUAN, Qingwang (Stanford University)

Co-author: Dr WANG, Jinjie (China University of Geoscience)

Presenter: YUAN, Qingwang (Stanford University)

Session Classification: Parallel 5-A

Track Classification: MS 2.05: Modeling and Controlling of Viscous Fingering in Miscible and Immiscible Displacements in Subsurface Porous Media