

Miscible Gas Injection Studies: Multicontact Tests

Define miscibility conditions and physical properties for enhanced oil recovery

APPLICATIONS

- Determining compositions of equilibrium vapor and liquid during backward or forward multicontact testing at test pressure
- Providing input for equation-of-state (EOS) modeling and reservoir simulation

FEATURES

- Defines mechanism to establish dynamic miscibility
- Corresponds to compositional changes that occur in a reservoir during gas injection

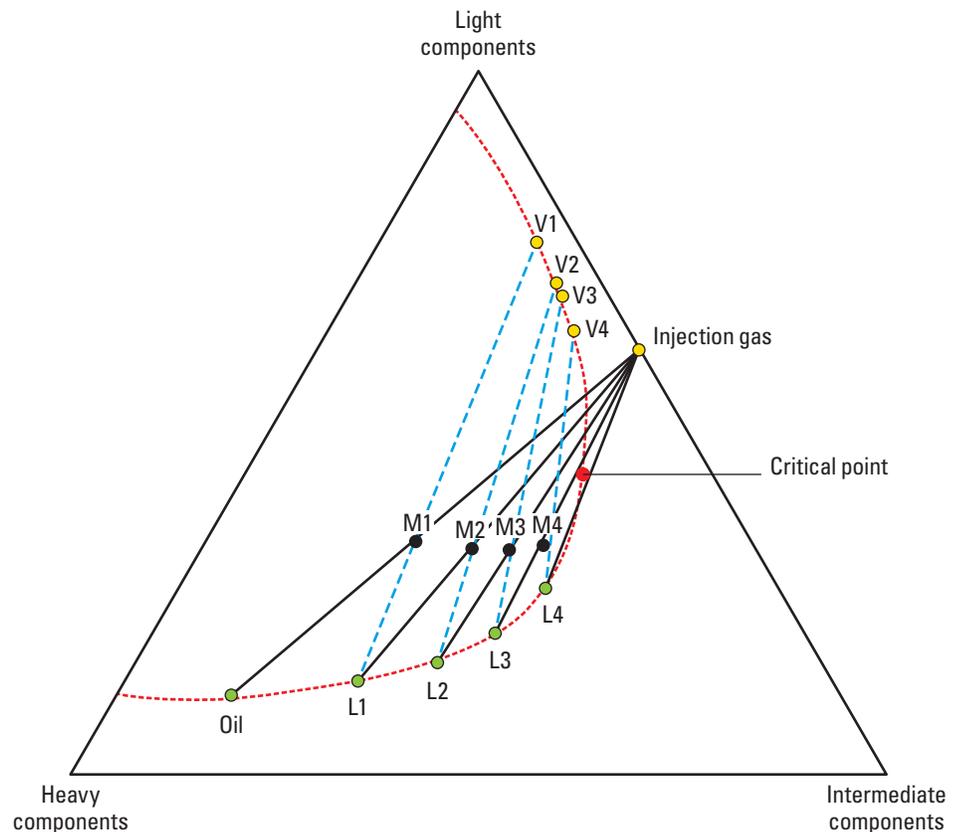
Schlumberger provides a complete suite of studies required for enhanced oil recovery (EOR) evaluation with miscible gas injection projects. This suite includes swelling studies, multicontact tests, slim tube tests, rising bubble tests, and coreflood studies. The combination of these studies' laboratory results defines the miscibility conditions and oil and solvent physical properties necessary to optimize recovery and production costs in gas injection processes.

Multicontact tests involve successive additions of fresh injection gas into the equilibrium liquid (backward contact) or successive additions of fresh reservoir fluid into the equilibrium vapor (forward contact). After each contact, the fluid system is equilibrated at the desired

test pressure, and the fluid volume and composition of each phase is measured. Multicontact data are presented in the form of pseudoternary diagrams showing the phase compositions as a series of tie lines connecting the composition points on the two-phase boundary.

The multicontact experiment corresponds to the compositional path in the reservoir, providing

- a description of the mechanism by which miscibility is achieved
- a dataset to tune EOS models for prediction of minimum miscible pressure (MMP) and minimum miscible composition (MMC)
- relevant compositional data not available elsewhere.



This ternary diagram shows the compositional changes during backward-contact testing and represents the condensing-gas drive mechanism. Multicontact testing provides an equilibrium compositional dataset used to tune EOS models for the prediction of MMP.