Phase mobility

A property characterizing agility of the fluid α-phase under pressure gradient with account of reservoir permeability and dynamic fluid viscosity:

(1) $$M_\alpha(s) = \frac{k_\alpha}{\mu_\alpha} = \frac{k_{air} \cdot k_{r\alpha}}{\mu_\alpha} = k_{air} \cdot M_{r\alpha}(s)$$

where

$k_\alpha(s)$	formation permeability to fluid α-phase
μ_α	dynamic viscosity of fluid α-phase
k_{air}	absolute permeability to air
$M_{r\alpha}(s) = \frac{k_{r\alpha}}{\mu_\alpha}$	relative phase mobility
$k_{r\alpha}(s)$	relative formation permeability to fluid α-phase
$s = \{s_\alpha\}$	reservoir saturation $\sum_\alpha s_\alpha = 1$, α-phase saturation

In most popular case of a 3-phase fluid model this will be:

$s = \{s_w, s_o, s_g\}$	$s_w + s_o + s_g = 1$
$M_o = \frac{k_o}{\mu_o}$	oil mobility
$M_g = \frac{k_g}{\mu_g}$	gas mobility
$M_w = \frac{k_w}{\mu_w}$	water mobility

See also

Physics / Fluid Dynamics / Percolation

Petroleum Industry / Upstream / Subsurface E&P Disciplines / Field Study & Modelling

[Petrophysics] [Basic reservoir properties] [Permeability] [Absolute permeability] [Relative permeability] [Wettability] [Phase mobility] [Relative phase mobilities]

[Multihase Fluid Mobility]