2D SIMULATION OF DRAINAGE PERFORMANCE IN A STRATIFIED VERTICAL POROUS CHANNEL

Seladji, C.

Abstract :

A 2D numerical simulation of the drainage process in a stratified vertical porous channel is performed for different gas flow rates. The porous matrix consists of two cylindrical homogeneous layers of packed sand with different permeability, initially saturated with a wetting phase. The porosity and the permeability of each layer are assumed to be constant. Since the injected gas is provided through a small hole, the drainage process can be affected by the injection section for the same flow rate. The geometric parameters of the cylindrical core are analyzed as well. Some results show that the recovery can be improved by judicious distribution of the gas injection points. The thicknesses of the matrix layers affect significantly the saturation and the velocity profiles. The calculation shows instability for small flow rates, and convergence is not reached. This fact can be explained by the insufficient pressure of the injected gas, ensuring a positive capillary pressure in both strata.

Keywords : drainage efficiency, stratified porous channel, capillary pressure, relative permeability.