

Numerical Study for Examination of Flow Characteristics in Fractured Gas Reservoirs

Authors : M. K. Kim, C. H. Shin, W. G. Park

Abstract : Recently, natural gas resources are issued due to alternative and eco-friendly energy policies, and development of even unconventional gas resources including tight gas, coal bed methane and shale gas is being rapidly expanded from North America all over the world. For developing these gas reservoirs, it is necessary to investigate reservoir characteristics by using reservoir simulation. In reservoir simulation, calculation of permeability of fractured zone is very important to predict the gas production. However, it is difficult to accurately calculate the permeability by using conventional methods which use analytic solution for laminar flow. The flow in gas reservoirs exhibits complex flow behavior such as slip around the wall roughness effect and turbulence because the size of the apertures of fractures is ranged over various scales from nano-scale to centi-scale. Therefore, it is required to apply new reservoir flow analysis methods which can accurately consider complex gas flow owing to the geometric characteristics and distributions of various pores and flow paths within gas reservoirs. Hence, in this study, the flow characteristics and the relation between each characteristic variable was investigated and multi-effect was quantified when the fractures are compounded for devising a new calculation model of permeability of fractured zone in gas reservoirs by using CFD.

Keywords : fractured zone, gas reservoir, permeability, CFD

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