A FRACTAL MODEL OF FRACTIONAL FLOW IN A FISSURED LEAKY-CONFINED AQUIFER WITH CONSTANT FREE-SURFACE LEVEL

1Hamm, S.--Y. 1Depa. of Geol., Pusan, National University, Pusan, Korea.

This study deals with transient fractional flow in a leaky confined aquifer with constant free-surface level and with the interporosity skin between the leaky confined aquifer and the semiconfining layer considering the specific storage. The wellbore storage and the skin effects on the pumping well are also considered. This model is also compared with the leaky confined aquifer with no storage in the semiconfining layer. The behavior of fluid flow in the fissured media is often dominated by the fractal fracture network. In this case, fractal models may be necessary to decide suitable hydraulic parameters. In addition, fluid flow in fractured media induced by pumping is mainly controlled by more conductive fractures which are only small fraction (it is called as backbone) not implying dead-end clusters. This is the reason why the fractal fracture models can not be related with the fractal models on fractional flow directly. Type curves of dimensionless drawdown are plotted for different fractional flow dimensions (0.5, 1, 1.5, 2, 2.5 and 3) with various values of the hydraulic parameters (the interporosity flow coefficient, the fissure system storativity fraction and the interporosity skin) on the pumping well and an observation well located either in the fissure or in the block. The dimensionless drawdown curves become stable at late time followed by the fractional flow in the fractured aquifer at early time and by the growing contribution from the semiconfining layer during the intermediate time.