

عنوان مقاله:

Modeling of Coupled Heat and Fluid-Flow in a Fractured Block (Comparison between Variable Width Fracture and Constant Width Fracture)

محل انتشار:

پنجمین کنگره بین المللی مهندسی شیمی (سال: 1386)

تعداد صفحات اصل مقاله: 10

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خلاصه مقاله:

Despite major advances in recent years, mathematical modeling of fluid-flow and heat-flow in fractured reservoir remains a difficult problem. A numerical model is formulated that simultaneously describes the fracture behavior with consideration to fluid-flow and heat-flow. With this modeling, it is possible to predict the temperature and pressure profile during hot-fluid injection into an oil reservoir or cold-fluid injection into a geothermal reservoir. A possibility to increase the recovery percentage, particularly in the case of highly viscous oils, is to supply heat to the reservoir so as to increase the temperature of the latter and to lower the viscosity of the oil. The purpose of this paper is to investigate the response of fractured rock of heavy oil reservoir with both constant and variable width of fracture to hot-fluid injection. The case is studied in which heat is supplied to the reservoir by injection of hot fluid. Flow equations and heat equations of hot fluid injection into fractured reservoir with new assumption, which describes the change in fracture orientation are investigated. The model is also simulated by Eclipse 300. The graphs from numerical modeling and simulation are compared and same results are obtained. During hot fluid injection into fractured block model, the fracture with constant width behaves like a horizontal fracture and the fracture with variable width behaves like a vertical one. This paper and related papers can increase the awareness of engineers about potential complication in fracture behavior when using hot-fluid injection, and to provide some guidelines on how to use this phenomenon to maximum benefit.

کلمات کلیدی:

fluid and heat flow, fracture behavior, fracture width

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