

## عنوان مقاله:

Investigation of dry forward in-situ combustion process in heterogeneous models: effects of heterogeneity

## محل انتشار:

پنجمین همایش بین المللی نفت، گاز، پتروشیمی و HSE (سال: 1399)

تعداد صفحات اصل مقاله: 8

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## خلاصه مقاله:

Heavy oil in complicated reservoir has the potential to be an energy source for the next generations, since a long time ago Light oil reservoirs have been depleted more easily than the heavy oil reservoirs. In situ combustion process can be reckoned as one of the most practical approaches in enhanced oil recovery and development of these types of reservoirs. For this purpose, air (usually hot air) is injected in the reservoir to achieve ignition and combustion front maintenance. Then it will push heated oils and front advancement toward producer wells. In this paper, a simulation model of Kumar's combustion tube was applied, tuned and validated using experimental data presented by Kumar. Further investigation of heterogeneity effects on Top-Down In-situ combustion process was done through modification of a basic model to heterogeneous models including Areal and Vertical types. Also, various parameters such as average temperature of the system, cumulative oil and water production, diffusion and fluid saturation were investigated. Results revealed the significant role of permeability variation on ISC process. Both of Vertical and Areal types of heterogeneity can effect ISC process. Simulation results demonstrate that the vertical heterogeneity has a minor effect on front's shape, cumulative oil and water and gas saturation distribution; however, the front advancement and velocity influenced by vertical heterogeneity considerably. In contrast to vertical type, the Areal heterogeneity can effect on an extensive range of parameters such as front's shape and velocity, gas distribution, cumulative fluid. The simulation results confirmed negative effect of Areal heterogeneity on In-situ combustion process. In other words, the results indicate that the orientation of wells and layers play an important role in the ISC process.

## کلمات کلیدی:

In-situ Combustion, Heterogeneity, Combustion Front, Combustion Tube, Average Temperature

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