عنوان مقاله:

Efect Of Varying Fluid Velocity And Pipe Diameter In Simulation Of Oil-Water Separation With Helical Pipes

محل انتشار:

پنجمین کنفرانس بین المللی تحقیقات نوین پژوهشی در مهندسی و تکنولوژی (سال: 1396)

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خلاصه مقاله:

Oil-water separation has numerous applications in oil and gas industries and various methods and devices have been used for this purpose. One of the common separators is helical separator in which separation of two phases with different densities is done using eccentricity and gravity. In this investigation, the operation of a helical pipe separator is considered using numerical simulation with the method of computational fluid dynamics. The Eulerian - Eulerian method is used to model the two-phase current in the fluent software. The variables of the problem like pipe diameter, the gyration radius of the helix, the number of loop turns of the helix, and the speed of input fluid are considered for optimization of the performance of the device. Two goals are set for the optimization including current pressure drop and the amount of separation. The device performance is more desirable with lower pressure drop and higher amount of separation. The results of the investigation showed that there are optimum values for each of the variables. Finally, the optimum value of the parameters are obtained as: pipe diameter 50 millimeters, helix radius 500 millimeters, the number of turns 5 and input speed 0.3 meters per second.

کلمات کلیدی:

oil-water separation, helical pipes, fluent software, performance optimi