

Dynamic properties of Couette-Taylor reactor

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Product yield and energy reduction of several chemical processes are a goal of today's study. So, many alternatives are researched. Couette-Taylor reactor is one of the alternatives. The reactor has a good mixing effect more than other reactors and it can achieve turbulence region easily. This research is implemented about Couette-Taylor flow properties. Couette-Taylor flow is occurring between two concentric cylinders because centrifugal force and pressure make instability. In addition, the Couette-Taylor flow has Taylor vortex flow which consists of a pair of toroidal axisymmetric vortices. So, Taylor vortex makes the mixing effect more increase. These results are confirmed with Computational Fluid dynamics (CFD), Comsol Multiphysics, which consists of Navier-Stokes module and Concentration module. The mixing effect of irreversible reaction is different depending on the inner cylinder rotating speed changing inside vortex and outside vortex region. Furthermore, using particle tracing model, particle distribution in the Couette-Taylor reactor is simulated. So, the particle residence time is calculated with Matlab.