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Hydrodynamic Analysis with Heat Transfer in Solid Gas Fluidized Bed Reactor for Solar Thermal Applications

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Abstract : Fluidized bed reactors are known as highly exothermic and endothermic according to uniformity in temperature as a safe and effective mean for catalytic reactors. In these reactors, a wide range of catalyst particles can be used and by using a continuous operation proceed to produce in succession. Providing optimal conditions for the operation of these types of reactors will prevent the exorbitant costs necessary to carry out laboratory work. In this regard, a hydrodynamic analysis was carried out with heat transfer in the solid-gas fluidized bed reactor for solar thermal applications. The results showed that in the fluid flow the input of the reactor has a lower temperature than the outlet, and when the fluid is passing from the reactor, the heat transfer happens between cylinder and solar panel and fluid. It increases the fluid temperature in the outlet pump and also the kinetic energy of the fluid has been raised in the outlet areas.

Keywords : heat transfer, solar reactor, fluidized bed reactor, CFD, computational fluid dynamics
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