**عنوان مقاله:**

Numerical simulation of nanofluid flow over diamond-shaped elements in tandem in laminar and turbulent flow

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**خلاصه مقاله:**

In this paper, the Al۲O۳-water nanofluid flow in laminar and turbulent flows inside tubes fitted with diamond-shaped turbulators is numerically modeled. The nanofluid flow is modeled by employing a two-phase mixture method and applying the constant heat flux boundary condition at tube walls. In the results, the effects of different parameters such as the geometry of turbulators, volume fraction and diameter of nanoparticles, etc. on the flow field in the tubes have been investigated. The obtained results indicate that, with the reduction of tail length ratio (TR) and increase of vertex angle of turbulators (θ), the heat transfer coefficient as well as the wall shear stress increase. Similarly, with the reduction of TR and increase of θ, the amount of secondary flows, vortices and the turbulent kinetic energy increase. Moreover, the increase in the volume fraction of nanoparticles and the reduction of nanoparticles diameter lead to the increase of the heat transfer coefficient and wall shear stress.

**کلمات کلیدی:**

Nanofluid, Diamond-shaped turbulators, CFD, turbulent flow, Mixture model