Marangoni driven boundary layer flow past a flat plate in nanofluid with suction/injection

ABSTRACT

The problem of Marangoni convection boundary layer flow past a flat plate in a nanofluid when the wall is permeable, where there is suction or injection effect, is studied using different types of nanoparticles. The general governing partial differential equations are transformed into a set of two nonlinear ordinary differential equations using unique similarity transformation. Numerical solutions of the similarity equations are obtained using the Runge-Kutta-Fehlberg (RKF) method. Three different types of nanoparticles, namely Cu, Al2O3 and TiO2 are considered by using water as a base fluid with Prandtl number $Pr = 6.2$. The effects of the suction or injection parameter on the flow and heat transfer characteristics are discussed.