Abstract

The main concern of the present paper is to study the impact of flow parameters on fluid velocity and temperature in an electrically conducting fluid past a wedge. MHD mixed convective heat transfer for an incompressible, laminar, and electrically conducting casson nanofluid flow past a permeable wedge investigated via a numerical method, called fourth-order accurate collocation-based solver (BVP4C). The boundary-layer governing partial differential equations (PDEs) are transformed into highly nonlinear coupled ordinary differential equations (ODEs) consisting of the momentum and energy equations using similarity solution. The velocity is found to increase with an increasing Falkner Skan exponent whereas the temperature decreases. With the rise of the Casson fluid parameter, the fluid velocity increases but the temperature is found to decrease in this case. It is found that the temperature decreases as the Prandtl number increases and thermal boundary layer thickness decreases with increasing values of the Prandtl number. A significant finding of this investigation is that flow separation can be controlled by increasing the value of the Casson fluid parameter. The results demonstrate a good agreement with previously published studies for some special cases.