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Effects of homogenous–heterogeneous reactions on radiative NACL-CNP nanofluid flow past a convectively heated vertical riga plate
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Abstract
In this paper, the boundary layer flow and heat transfer of sodium chloride (NaCl)-carbon nanopowder (CNP) nanofluid over a Riga-plate with homogeneous–heterogeneous quartic autocatalysis chemical reaction in the presence of convective heating and thermal radiation is investigated. The similarity transformed nonlinear governing equations are obtained and tackled numerically using shooting technique. Effects of thermo-physical parameters on the nanofluid velocity, temperature, chemical species concentration, skin friction, and local Nusselt number are discussed quantitatively. It is found that momentum, thermal and concentration boundary layer thicknesses diminished due to Lorentz force effects. An enhancement in values of Biot number, nanoparticle volume fraction and thermal radiation parameter upsurges nanofluid temperature causing diminution in thermal boundary layer thickness. The skin friction coefficient exhibits increasing trend in the order of nanoparticles (carbon nanopowder (CNP) < graphite < carbon black (CB)) at the relatively higher values of strength of heterogeneous reaction. © 2018 by American Scientific Publishers All rights reserved.

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