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MHD heat and mass transfer flow of a nanofluid over an inclined vertical porous plate with radiation and heat generation/absorption
(2017) *Advanced Powder Technology*, 28 (3), pp. 1008-1017. Cited 21 times.

Abstract
MHD boundary layer flow, heat and mass transfer analysis of nanofluid over an inclined vertical plate saturated by porous medium with thermal radiation, magnetic field and heat generation/absorption is investigated in the present article. By using similarity variables the governing non-linear partial differential equations are transformed into ordinary differential equations and these equations together with associated boundary conditions are solved numerically by using versatile, extensively validated, variational Finite element method. The sway of key parameters, such as, Magnetic parameter (M), buoyancy ratio parameter (Nr), Radiation parameter (An), Heat source/sink parameter (Q), Brownian motion parameter (Nb), thermophoretic parameter (Nt) and Lewis number (Le) on hydrodynamic, thermal and concentration boundary layers are examined in detail and the results are shown graphically. Furthermore, the impact of these parameters on local skin friction coefficient (Cf), rate of heat transfer (Nux) and rate of mass transfer (Shx) is also investigated. The results are compared with the works published previously and found to be excellent agreement. © 2017 The Society of Powder Technology Japan

2-s2.0-85010950509
Document Type: Article
Publication Stage: Final
Source: Scopus