

Electrothermal instability in an anisotropic porous medium saturated by nanofluid with magnetic field

ABSTRACT

The combined effects of magnetic field and electric field on the onset of thermal convection in an anisotropic saturated by nanofluid has been studied. The nanofluid layer bounded by rigid-rigid, rigid-free and free-free boundaries with zero flux of nanoparticles volumetric fraction. Linear stability theory is employed and the characteristic equation for Rayleigh number is obtained by using the single term Galerkin approximation. The results are presented graphically to observe the effect of electric Rayleigh number, magnetic field, mechanical anisotropy parameter as well as thermal anisotropy parameter.

Keyword: Thermal convection; Anisotropy; Nanofluid; Magnetic field; Electric field