Facilitating the indirect detection of genomic DNA in an electrochemical DNA biosensor using magnetic nanoparticles and DNA ligase

ABSTRACT

The onset of thermal convection in a horizontal layer of a dielectric nanofluid saturated an anisotropic porous medium with vertical AC(alternate current) electric field has been studied. We considered Darcy model for porous medium while for nanofluid model used, it incorporates the effects of thermophoresis, electrophoresis and Brownian motion. A linear stability analysis based upon a normal mode has been performed, and the expression of thermal Rayleigh number is obtained using the Galerkin method. The results show that an increase value of AC electric Rayleigh number, Re and mechanical anisotropy parameter, ξ is to destabilize the system of nanofluid layer while the thermal anisotropy parameter, η has stabilizing effect on the onset of electroconvection.