

his paper reports an analytical and numerical study of double-diffusive convection in a vertical rectangular enclosure containing a porous medium saturated with an electrically conducting binary mixture. The convective flow is driven by applying constant fluxes of heat and solute to the vertical walls and subject to a uniform magnetic field applied in the  $x$  direction. The analysis deals with the particular situation where the thermal and solutal buoyancy forces are equal and opposing each other. The linear stability theory of the diffusive and convective states is conducted on the basis of finite element method. The linear stability theory is used to predict numerically the critical Rayleigh number for the onset of convection. Also, the linear stability of the convective motion, predicted by the parallel flow approximation, is conducted in order to predict the thresholds of Hopf's bifurcation, which characterizes the transition point between steady and unsteady convection state. Numerical solutions of the full governing equations are obtained for a wide range of the governing parameters. In the range of governing parameters considered in this study, the heat, mass, and flow characteristics predicted by the parallel flow approximation are found to agree well with the numerical results of the full governing equations. It shows that both the strength of convection and the resulting heat and mass transfer rates decrease as the value of the Hartmann number is made large