Highlights

1. The critical magnetic Rayleigh number has been calculated for stationary and oscillatory instabilities.
2. The destabilizing behavior has been obtained for the effect of porous and Soret parameters.
3. We examine the effect non-buoyancy magnetization parameter *M*3 and dust particle parameter *h*1 have a destabilizing behavior.
4. The Soret effect play’s a dominant role for the instability of the system.