Abstract

The effect of a radial magnetic field on separation of a binary mixture of incompressible viscous thermally and electrically conducting fluids confined between two concentric cylinders in which the inner is rotating with a uniform angular velocity and having a uniform suction of the mixture with a constant velocity and outer is at rest. The equations governing the motion, temperature and concentration in cylindrical polar co-ordinate are solved analytically. The solution obtained in closed form for concentration distribution is plotted against the radial distances from the surface of the inner cylinder for various values of non-dimensional parameters viz. The Hartmann number, thermal diffusion number, baro diffusion number, suction Reynolds number, the product of Pradtl number and Eckert number, the product of Schmidt number and suction Reynolds number and the suction parameters affects the species separation of rarer and lighter component significantly.
- Simon O (1953) an Analysis of Laminar Free Convection Heat Transfer about a Flat Plate Parallel to Direction of the Generating Body Force. N. S. S. A. Rep
- Sarma GSR (1975) Barodiffusion in a Rotating Binary Mixture over an infinite Rotating disk. Z Angew Math Phys 26:337-345
- Srivastava AC(1999)Separation of a binary mixture of viscous fluids by thermal diffusion near a stagnation point. Ganit 50(2):129-134
- Srivastava AC (1991) seperation of binary mixture in a viscous fluid due to rotating
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heated sphere. Bull GUMA 6:63-72

Index Terms

Computer Science
Applied Sciences

Keywords
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