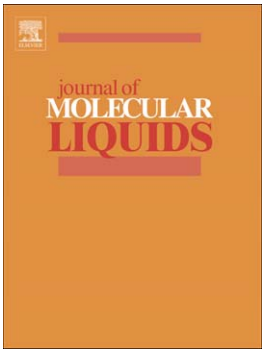

Effectiveness of magnetic nanoparticles in radiative flow of Eyring-Powell fluid

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Effectiveness of magnetic nanoparticles in radiative flow of Eyring-Powell fluid

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Abstract: The present work studies the MHD two-dimensional flow of Eyring-Powell fluid with thermophoresis and Brownian motion. Flow caused is due to convection type stretching cylinder. Thermal radiation and heat source/sink phenomenon characterizes the heat transfer process. Computations for strong nonlinear systems are presented after non-dimensionalization. Thermal and nanoparticles concentration fields for nonlinear boundary value problems are calculated and discussed. The velocity, temperature and concentration gradients are also evaluated. The major outcome of the present study is that Brownian motion and thermophoretic phenomenon boosts temperature however nanoparticles concentration distribution has opposite behavior for these phenomenon. Moreover thermal and concentration Biot numbers have similar impacts on temperature and concentration.

Keywords: Mixed convection, nanoparticles, variable thermal conductivity, heat source/ sink, stretching cylinder.

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