Heat transfer analysis in entropy optimized Sutterby nanofluid flow over a porous medium

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Abstract

In present communication irreversibility analysis in Sutterby nanofluid flow towards stretching permeable surface is analyzed. Dissipation, heat flux, heat source/sink and Joule heating impacts are scrutinized in energy expression. Physical description of irreversibility analysis is deliberated through second law of thermodynamics. Thermophoresis and random movement characteristics are also accounted. Furthermore first order binary chemical reaction is scrutinized. Ordinary differential system are obtained through similarity transformation. To get convergent series solution we employed ND-solve method. Prominent effect of involved variables on velocity filed, entropy optimization, temperature distribution, Bejan number and concentration are discussed. Skin friction coefficient, gradient of temperature and Sherwood number are numerically analyzed through tables. An increment in velocity field is noted for Reynold and Deborah number. An opposite behavior for velocity and temperature is noticed through magnetic parameter. Larger Schmidt number reduces the concentration distribution. Entropy generation is improved against Reynold and Brinkman numbers. An reverse trend is observed for Bejan number and entropy rate through magnetic parameter

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