

Marangoni convection in a double diffusive binary fluid with temperature dependent viscosity, Coriolis force and internal heat generation

ABSTRACT

A steady Marangoni convection in a horizontal double diffusive binary fluid is considered. Present study investigated the effects of temperature dependent viscosity, Coriolis force and internal heat generation to the onset of convection. The bottom boundary was set to be insulating or conducting to temperature. A detailed numerical calculation of the marginal stability curves were performed by using the Galerkin method and it is shown that temperature dependent viscosity, internal heat generation and Soret number destabilize the binary fluid layer system while Taylor number and Dufour number act oppositely to the system.

Keyword: Binary fluid; Double diffusive; Variable viscosity; Coriolis force; Heat generation