Abstract

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Double Diffusive Natural Convection in a Square Cavity with Segmental Heat Sources”

double-diffusive convective flow in a square enclosure with segmental heat sourcesrnis solved numerically .constant temperaturesconcentration are imposed along the rightrnwall of the enclosure at low temperatureconcentration which assumed as a heat andrnmass sink .the heaters are at constant temperatureconcentration assumed as source ofrnheatmass at the left wall while the rest of this wall is adiabatic. the other two sidesrnfrom the cavity are assumed adiabatic walls .the flow laminarunder steady staterncondition are considered .the transport equations for continuity, momentum, energy andrnmass transfer are solved. the numerical procedure adopted in this analysis yields consistentrnperformance over a wide range of parameters, rayleigh number (103 ra 106)rndimensionless heater lengths (0.2 l1/h 1) ,buoyancy ratio (-10 n 10)prandtlrnnumber, (0.01 <pr <100) .this study was done for constant lewis number le = 2.thernresults show the average nusselt numberaverage sherwood number are increased withrnthe increasing of the rayleigh number, the dimensionless heater lengthprandtl number .rnon the other hand, the prandtl number has significant effect on the nusselt number andrnaverage sherwood number to the value of pr = 0.7 .the results for the average nusseltrnnumber are correlated as a function of dimensionless heater length, buoyancy ratio,rnrayleigh numberprandtl number .the results were compared with previous results andrngood agreement was found.