

## 경사진 사각채널 내 고 점성유체의 혼합대류에 관한 3차원 수치 해석

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### A 3-D Numerical Analysis on Mixed Convection in the Inclined Rectangular Channels Filled with High Viscous Fluid

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**Key Words:** Mixed Convection(혼합대류), High viscous fluid(고 점성유체), Nusselt number(누셀트수), Angle of inclination(경사각)

**Abstract :** Mixed convection heat transfer in three-dimensional inclined rectangular channel (width/height=4) filled with high viscous fluid ( $Pr=909$ ) has been investigated computationally under various operating conditions. In this study, the Reynolds number was varied from  $4 \times 10^3$  to  $6.4 \times 10^2$ , the Rayleigh number from  $10^3$  to  $10^6$  and the angle of inclination from 0 to 45 degree. The governing equations are discretized using the finite volume method. From a parametric study, Nusselt number distributions were obtained and effects of Reynolds, Rayleigh numbers and angle of inclination on high Prandtl number mixed convection in 3-D inclined rectangular channels were investigated.

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### Synthesis of the Charged Silver Nanoparticle by a Supersonic Nozzle Expansion Method with Ion Nuclei

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**Key Words:** Nanoparticle(나노입자), Nozzle expansion(노즐 팽창), Corona discharge(코로나 방전)

**Abstract :** The synthesis of the charged silver nanoparticles by a supersonic nozzle expansion method with ion nuclei was investigated. For supplying ions in the developed nanoparticles generator, sonic-jet corona discharger was used as an ionizer. Corona discharge ions function as seeds for heterogeneous nucleation in the silver nanoparticle formation process and provide silver nanoparticles with a repulsive electrical force that prevents aggregation of the particles. For detailed analysis of generated nanoparticles properties such as size, morphology, composition and charge, sampled nanoparticles have been investigated by means of TEM, XRD analysis, EDS, and Faraday cup current measurement.