

عنوان مقاله:

Heat Transfer Enhancement in a Stagnant Dielectric Liquid by the Up and Down Motion of Conductive Particles
Induced by Coulomb Forces

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خلاصه مقاله:

When charged particles are exposed to an electric field the well-known Coulomb force acts on them. In this investigation, this force is utilized to induce vertical motion of spherical steel particles submerged in a dielectric liquid. The interelectrode space of a two parallel electrode system is filled with the liquid and dispersed steel particles, which become charged after contact with the electrodes. Experiments were carried out to measure the effect of this particle motion on the heat transfer between an electrode surface and an adjacent stagnant dielectric liquid. In order to interpret the experimental data, the dynamics of particles was analytically studied for low particle volume concentrations. Experimental results demonstrate significant heat transfer enhancement on low viscosity dielectric liquids. A detailed discussion is presented on the possible mechanisms responsible for such an enhancement

کلمات کلیدی:

Heat transfer enhancement, Particle motion, Coulomb forces, Dielectric liquid

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