Patent Search

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Abstract:

ABSTRACT TITLE: SYSTEM FOR PARTICLE MANIPULATION AND AGGREGATION This invention relates to a system for manipulating colloidal particles to concentrate into patterned particulate groups in an energy efficient way, by exclusive harnessing of the intrinsic Joule heating effects. The present system exploits alternating current electrothermal flow phenomenon which is generated due to the interaction between non-uniform electric and thermal fields. Highly non-uniform electric field generates sharp temperature gradients by generating spatially-varying Joule heat that varies along radial direction from a concentrated point hotspot. Sharp temperature gradients induce local variation in electric properties which, in turn, generate strong electrothermal vortex. The imposed fluid flow brings the colloidal particles at the centre of the hotspot and enables particle aggregation. Further, manoeuvering structures of the Joule heating spots, different patterns of particle clustering may be formed in a low power budget without necessitating highly focused laser beam which is much complicated and demands higher power budget.

Complete Specification

Claims:WE CLAIM:

1. A system for aggregation of particle and formation of pattern of thus aggregated particles comprising

atleast one bottom electrode and atleast one top electrode disposed facing each other and spaced apart to contain electrolytic solution with suspended aggregating particle between said electrodes;

power source connected with said electrodes for generation electric field across the electrodes; and

means to make said electric field non-uniform resulting one or more concentrated hotspot points in the electrolytic solution and thereby impose fluid flow to bring the particles at centre of said hotspot(s) and enable particle aggregation in desired pattern.

2. The system as claimed in claim 1, wherein each of the electrodes includes Indium Tin Oxide (ITO) coated glass substrate.

View Application Status

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