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Precision transport and assembling of nanowires in suspension by electric fields D.L. FAN, ROBERT CAMMARATA, C.L. CHIEN, Johns Hopkins University, MATERIALS TEAM, PHYSICS TEAM — We describe a method of precision transport of nanowires in suspension using a combination of dielectrophoretic force and electrophoretic force, which, respectively, aligns and transports the nanowires. We revealed the effect of electroosmosis flows on the nanowires and determined the ratio of viscous coefficients for nanowires moving parallel or perpendicular to the orientations. The transport of nanowires can be made to follow any prescribed trajectory with any orientation by the voltages applied to the patterned electrodes. As a demonstration of the high precision of manipulation, we have joined end-to-end two oppositely charged nanowires originally separated by 200 μm into a microelectromechanical device.

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