

Fabrication of nanogaps for single molecules electrical characterization

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Molecular electronics appears as one of the possible routes for new electronic systems. To study charge transport phenomena in single molecules, it is necessary to electrically contact them between metallic electrodes. Here, we report the fabrication of devices combining microfabricated electrodes and ac trapped colloidal particles. The trapping is made possible thanks to a dielectrophoretic process, which occurs in the presence of a non-uniform high frequency electrostatic field. We describe a controlled way to bridge the electrodes with the particles. Colloids of different metals have been synthesized as well as colloids functionalized with different types of molecules. We present and discuss electrical measurements performed on various devices.

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