A nanoclutch for nanobots

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Chinese researchers have designed and tested simulations of a "nanoclutch," a speed regulation tool for nanomotors.

The nanoclutch consists of two carbon nanotubes (CNTs), one inside the other, separated by a film of water. Electrowetting forces control the friction between the water and the inner and outer walls of the CNTs. When the two tubes are electrically charged, the water confined between them can transmit the torque from the inner tube to the outer tube, and the device is said to be in the engaged state. When the CNTs are uncharged, the device is in the disengaged state.

In a paper accepted to the American Institute of Physics' Journal of Applied Physics, the authors write that their proposed device can perform stepless speed regulation by changing the magnitude of the charge assigned to the CNT atoms.

Though further work is needed, they say the model may be helpful in designing and manufacturing nanorobots.

More information: Carbon Nanotube-Based Charge-Controlled Speed-Regulating Nanoclutch, Zhong-Qiang Zhang et al. *Journal of Applied Physics* (2012)

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