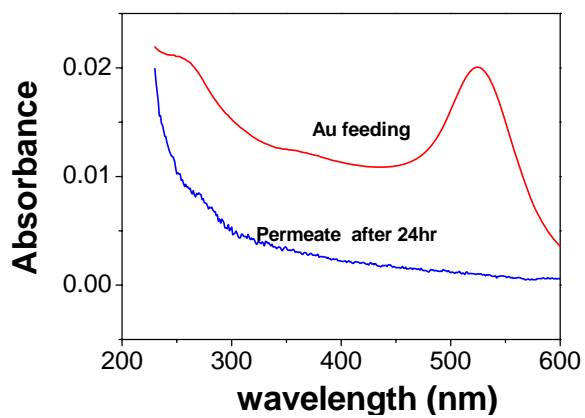
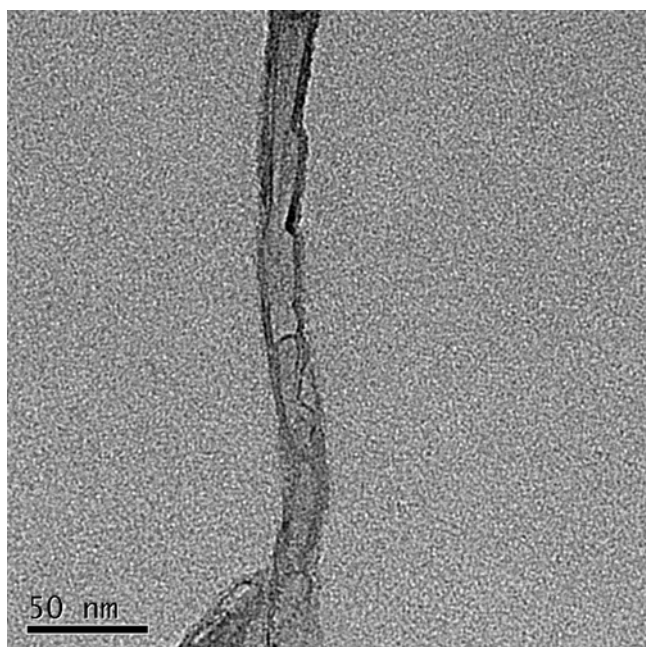


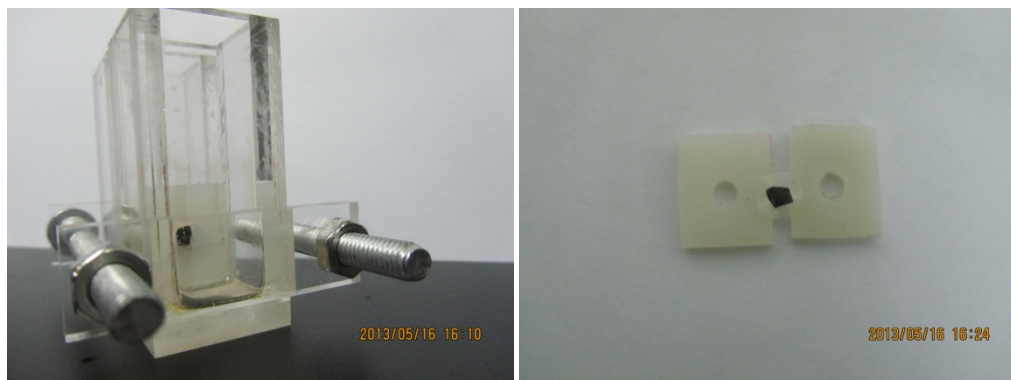
Supporting information



**Figure S1.** UV-vis spectra of 20nm Au colloid feed (red curve) and the permeate solution (blue curve) after 24 hours diffusion across aligned CNT membrane.



**Figure S2.** TEM image of bamboo-like structure of CNT



**Figure S3.** Photographs of: left) screw tightened diffusion cell with two pieces of silicon pad with 4mm diameter holes and one piece of CNT nano porous membrane between them; right) two pieces of silicon pad and one piece of CNT membrane on the top with the efficient filtration area about  $0.16\text{cm}^2$