Supporting Information

Selective adsorption of dithiolate-modified multi-wall carbon nanotubes onto alkanethiol self-assembled monolayers on Au(111)

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1. Multi-wall carbon nanotubes (MWCNTs) before and after oxidation

A chemical oxidation has been performed an acid mixture of H_2SO_4/HNO_3 at 60°C to generate carboxylic acid groups on the surfaces of MWCNTs. During the oxidation procedure, the as-received MWCNTs were shortened as demonstrated in Fig. S1.

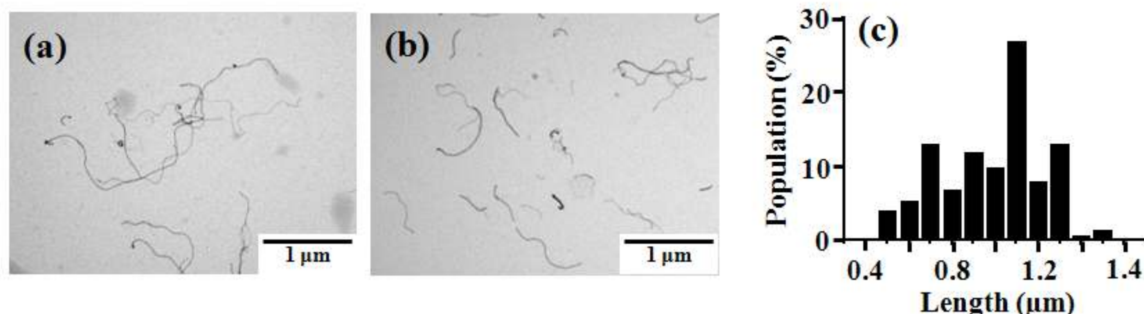

Fig. S1 TEM images of MWCNTs: (a) as received and (b) after oxidation in the mixture of H_2SO_4/HNO_3. The length distribution of MWCNTs after the oxidation is resented in (c).

2. Existence of dithiolates on MWCNTs

The dithiolates attached to the surfaces of MWCNTs are critical functional groups to anchor the massive MWCNTs onto the SAMs of alkanethiol on Au surfaces. The existence of dithiolates on MWCNTs was confirmed by comparing XPS spectra of C1s and S2s of the as-received MWCNTs and the MWCNTs before and after a reaction with alkanedithiol.

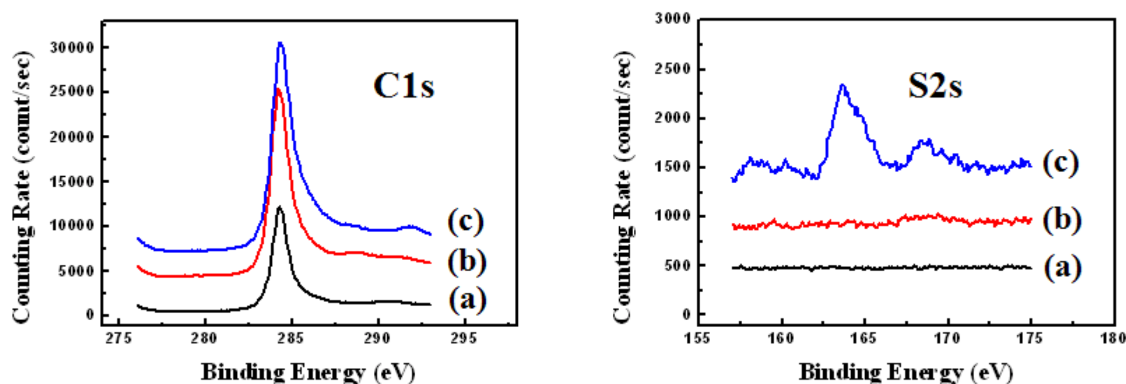

Fig. S2 The XPS spectra of MWCNTs in the regions of C1s and S2s: (a) as received, (b) before and (c) after the reaction of oxidized MWCNTs with alkanedithiol.

3. Preparation of the employed polydimethylsiloxane (PDMS) stamp

The PDMS stamp used in this work was prepared using a standard method.[1] A brief description of the procedure is as follows: (i) preparation of a 50 μm-thick photoresist (SU-8, Microchem, USA) film of on a silicon wafer using spin coating and baking at 80°C for 6 min, (ii) UV exposure of the photoresist film with a photomask for 10 min and baking 110°C for 5 min, (iii) developing the photoresist film with SU-8 developer (SU-8 developer, Microchem, USA) and washing, and (iv) casting of 10:1 mixture of an elastomer/curing agent (Sylgard 184, Dow Corning, USA) onto the developed silicon wafer and curing at 60°C for more than 2 hr under vacuum. Fig. S3 is an optical microscopic image of the PDMS stamp used in this work.

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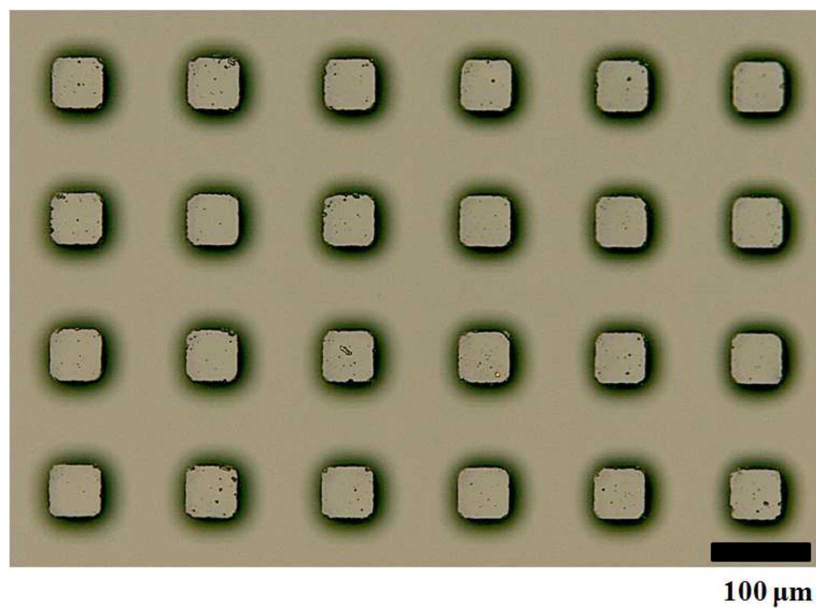

Fig. S3 An optical micrograph of the PDMS stamp used in this work.

References

1 A. Kumar and G. M. Whitesides, *Appt. Phys. Lett*, 1993, **63**, 2002