## Supplementary

## Figures:



Figure S1: FT-IR spectrum for MWCNTS, m-MWCNT-COOH, m-MWCNT-HA, m-MWCNT-

Cys, m-MWCNT-HYD



Figure S2: Raman spectrum for MWCNTS, m-MWCNT-COOH, m-MWCNT-HA, m-MWCNT-Cys, m-MWCNT-HYD.



Figure S3: SEM images of the original and the modified carbon nano tube (right) together with diameter distribution (left). (a) MWCNTs, (b) MWCNT-COOH, (c): m-MWCNT-HA, (d) m-MWCNT-CYS and (e) m-MWCNT-HYD. Scale bars: 5 μm.



Figure S4. Magnetic field dependence of the magnetization measured at (**a**) 300K (M–H loops) of m-MWCNT-HA, m-MWCNT-CYS, m-MWCNT-HYD and MWCNT; (**b**) the magnification of the central area of the hysteresis loops.