## Fabrication of Mesoporous Silica-coated CNTs and Application of Protein Separation in Size-Selective

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Figure S1. TEM images of  $SiO_2$  coated CNTs obtained by varying the amount of TEOS in the solution: (a) 0.2ml, (b) 0.5ml, (c) 1ml.



**Figure S2.** TEM images of SiO<sub>2</sub>-coated CNTs obtained by using anionic surfactant (SDS) and TEOS (a,b) ; TEOS and APTES (c,d).



Figure S3 TGA curve of the CNTs and CNTs@CTAB@SiO2



**Figure S4** UV-vis spectra of BSA in phosphate buffer solution at pH = 4.8(c), after mixing with the mesoporous CNTs@SiO<sub>2</sub> (d), UV-vis spectra of Lyz in carbonate buffer solution at pH = 11.2(e), after mixing with the mesoporous CNTs@SiO<sub>2</sub> (f),



**Figure S5. (A)** UV-vis spectrum of carbonate buffer solution containing concentration of 0.4 mg ml<sup>-1</sup> Cyt c and Lyz respectively (a), UV-vis spectrum of supernatant after binary protein solution of Cyt c and Lyz contacted with mesoporous CNTs@SiO<sub>2</sub> (b), and UV-vis spectrum of desorption solution of the adsorbed Cyt c and Lyz by the mesoporous CNTs@SiO<sub>2</sub> in the higher ionic strength (1.0M KCl) buffer (pH 9.6) (c). **(B)** The photos of bottle a-c in inset are corresponding to the solution of curve a-c respectively.



**Figure S6. (A)** UV-vis spectrum of carbonate buffer solution containing concentration of 0.4 mg ml<sup>-1</sup> Cyt c, Lyz and BSA respectively (a), UV-vis spectrum of supernatant after binary protein solution of Cyt c, Lyz and BSA contacted with mesoporous CNTs@SiO<sub>2</sub> (b), and UV-vis spectrum of desorption solution of the adsorbed Cyt c, Lyz and BSA by the mesoporous CNTs@SiO<sub>2</sub> in the higher ionic strength (1.0M KCl) buffer (pH 9.6) (c). **(B)** The photos of bottle a-c in inset are corresponding to the solution of curve a-c respectively.