Supporting Information

Preparation of diameter-controlled of free-standing MWCNT membranes and their application for dye adsorption

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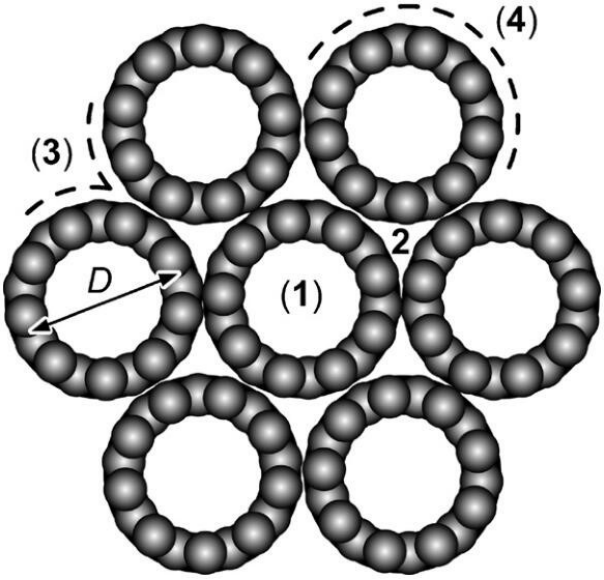

Fig. S1 Different adsorption sites in a homogeneous bundle of SWCNTs with tube diameter D: (1) intratubular, (2) interstitial channel, (3) external groove, and (4) exposed surface of peripheral tube. Sites 1 and 2 comprise the internal porous volume of the bundle, whereas sites 3 and 4 are both located on the external surface of the bundle [S1].

Reference

[S1] F. J. A. L. Cruz, I. A. A. C. Esteves, J. P. B. Mota, *Colloids Surf. A*, 2010, **357**, 43–52.

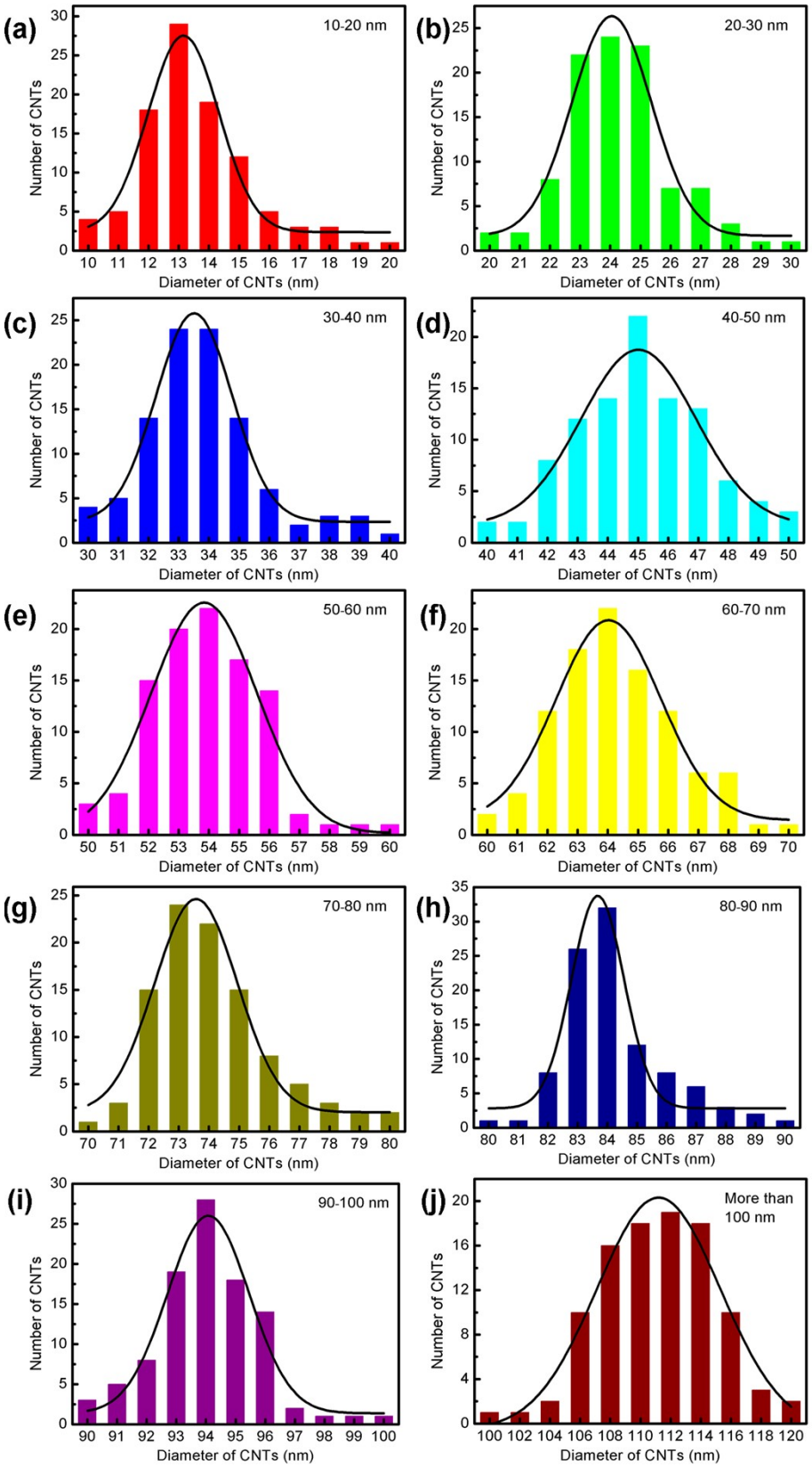

Fig. S2 Tipical MWCNT diameter distributions and their Gaussian fits.

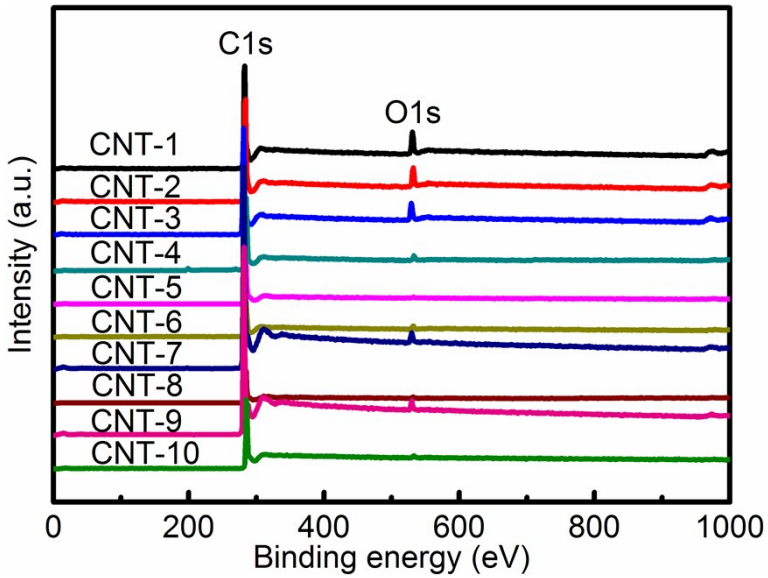

Fig. S3 XPS analysis of different MWCNT samples.

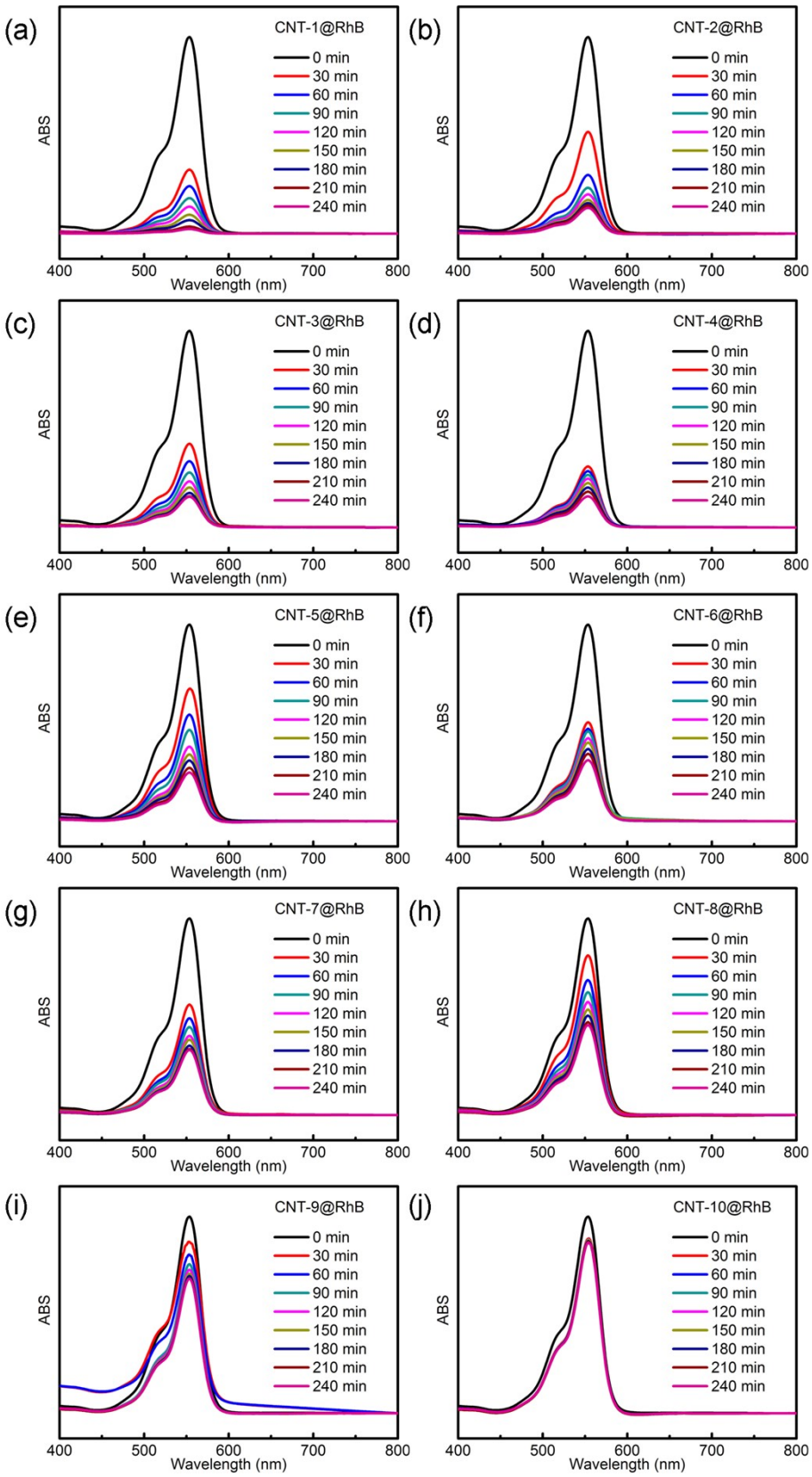

Fig. S4 UV-vis spectra of RhB solution after different adsorption times with the title MWCNTs in dark.

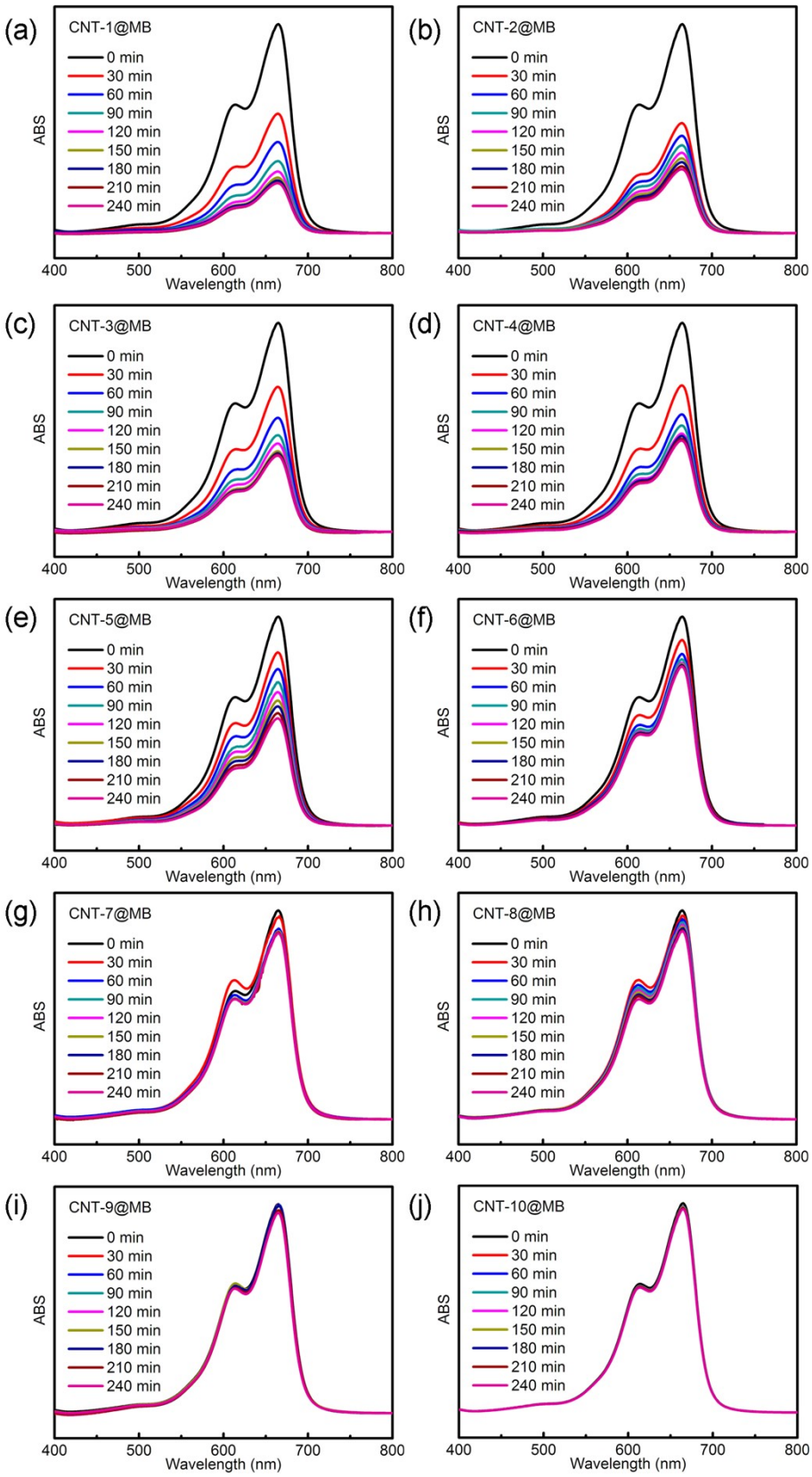

Fig. S5 UV-vis spectra of MB solution after different adsorption times with the title MWCNTs in dark.

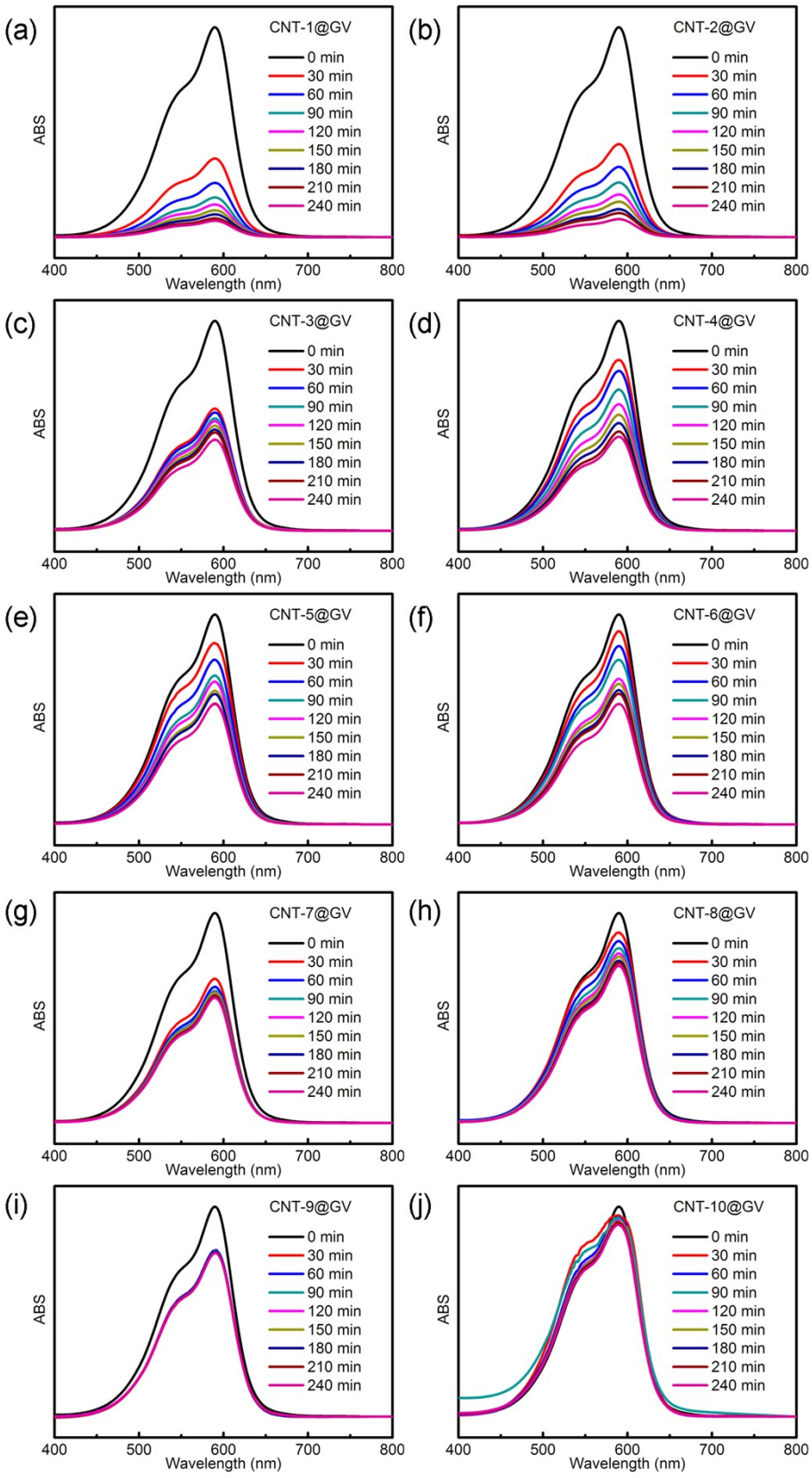

Fig. S6 UV-vis spectra of GV solution after different adsorption times with the title MWCNTs in dark.

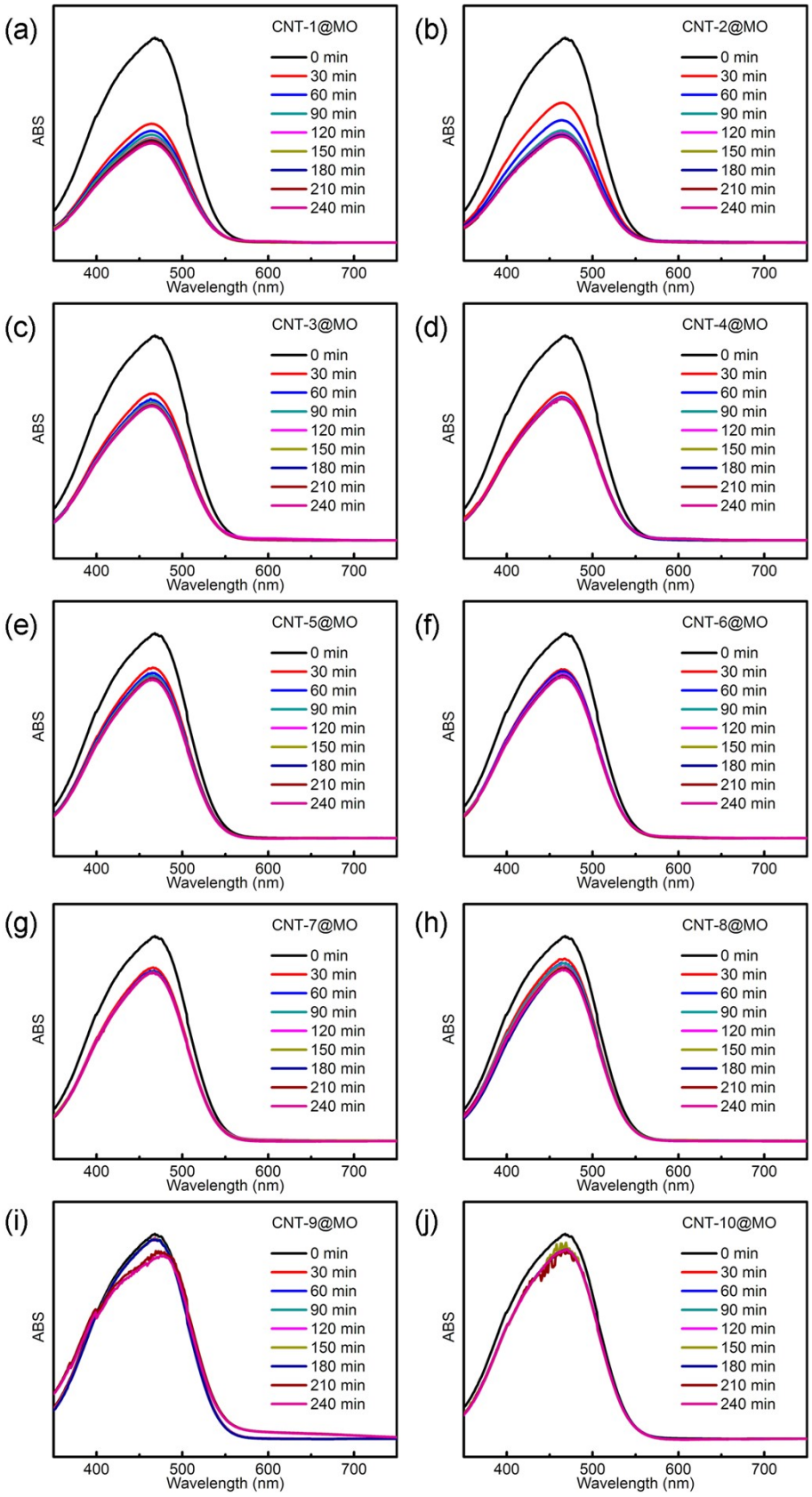

Fig. S7 UV-vis spectra of MO solution after different adsorption times with the title MWCNTs in dark.

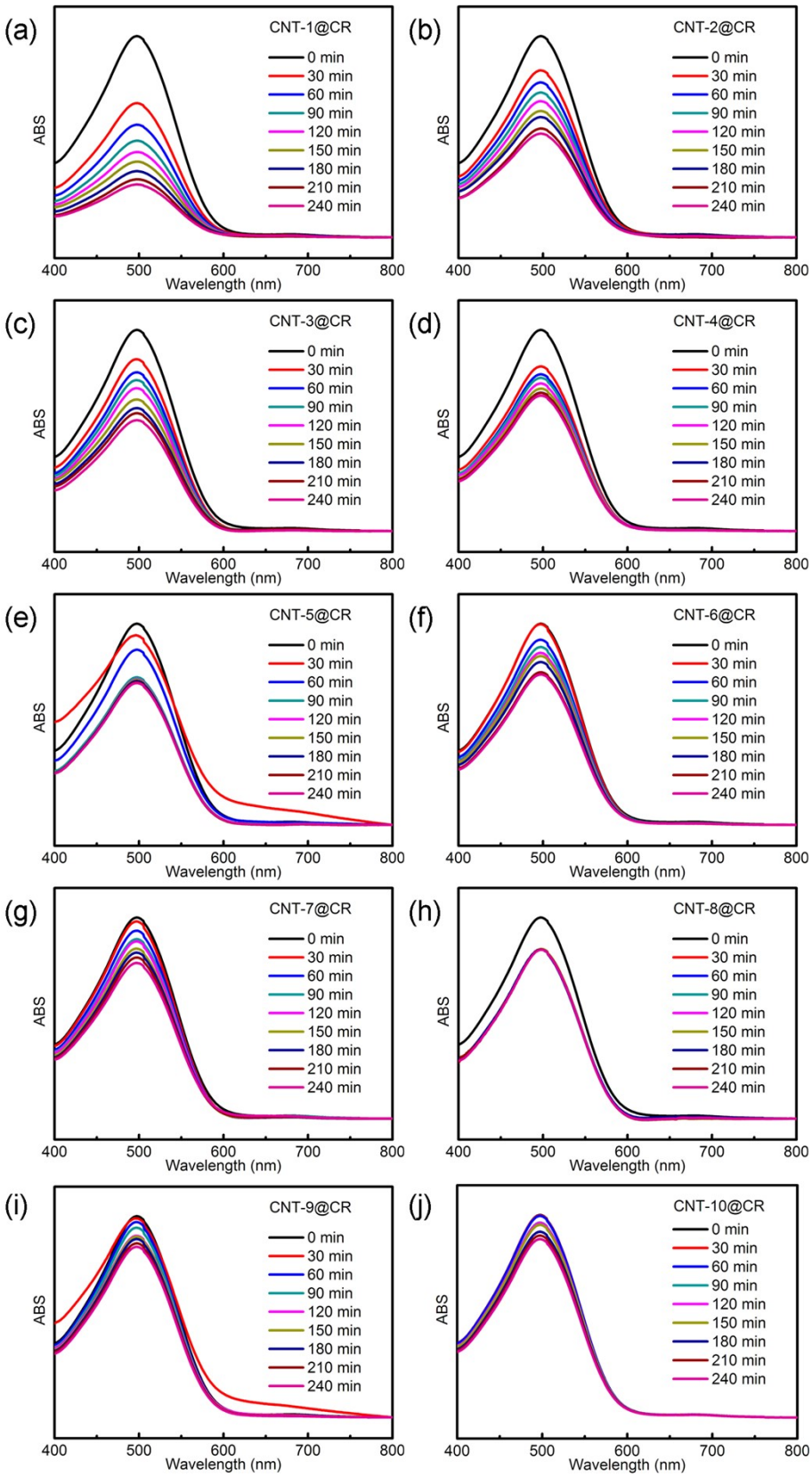

Fig. S8 UV-vis spectra of CR solution after different adsorption times with the title MWCNTs in dark.

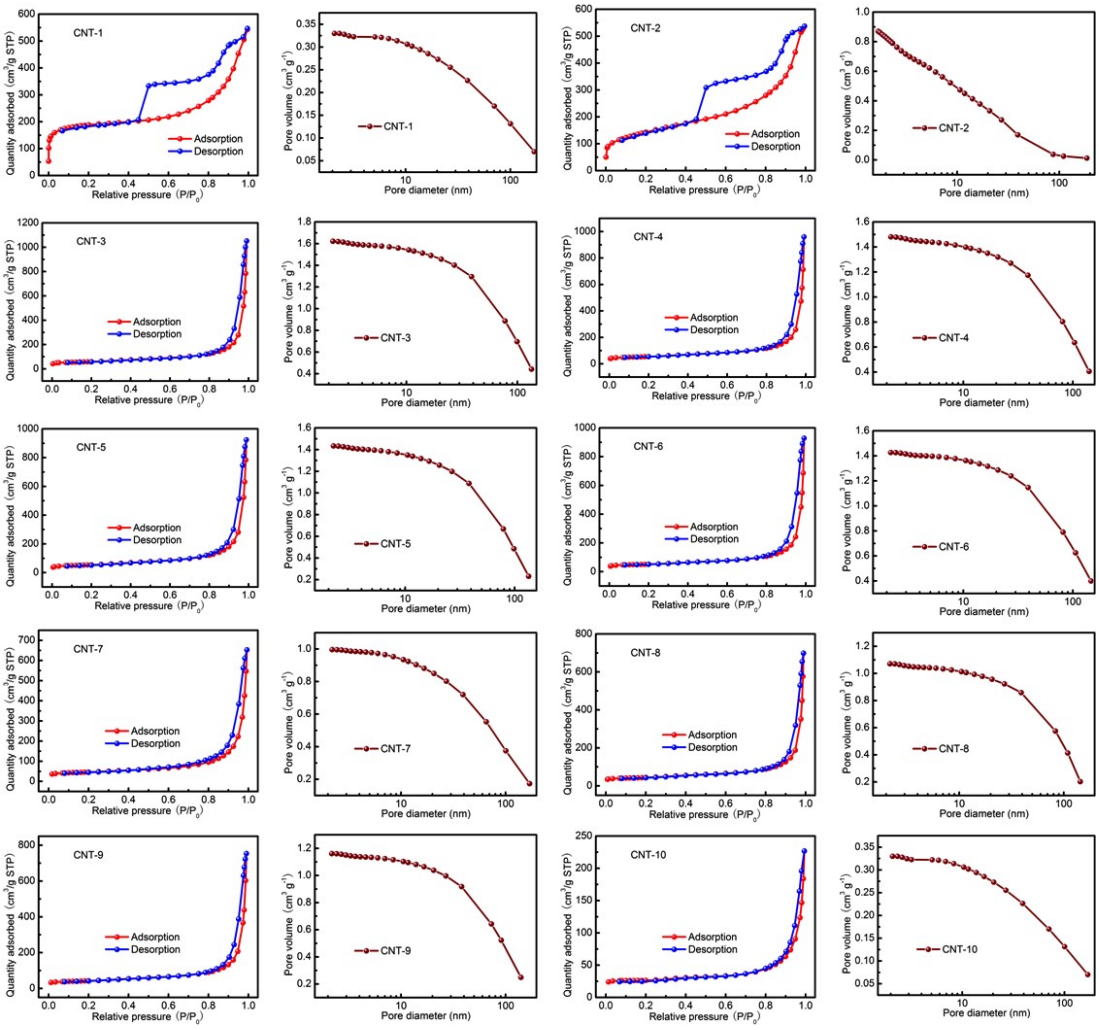

Fig. S9 Nitrogen adsorption and desorption isotherms and the pore size distributions of the title MWCNTs.

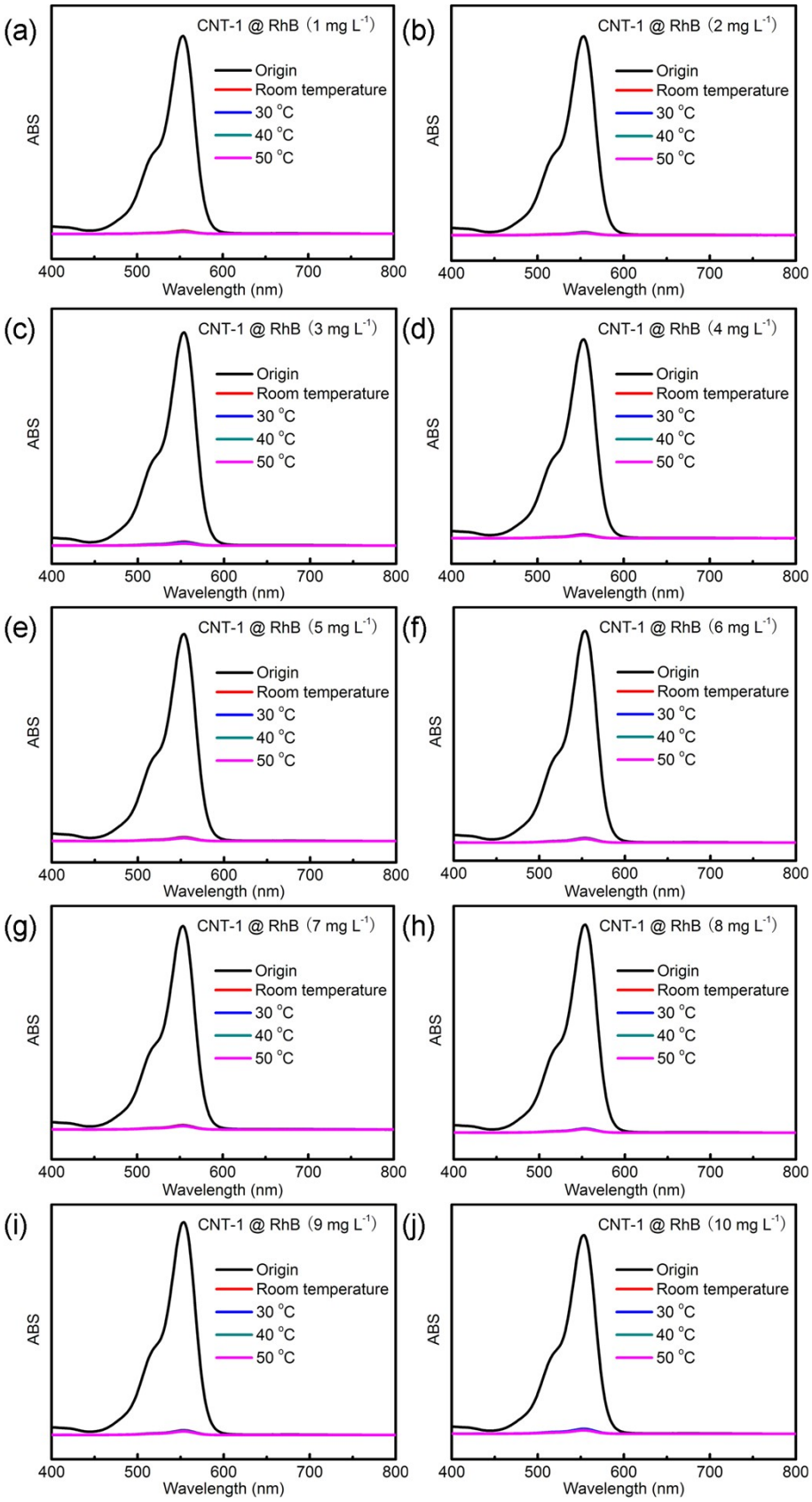

Fig. S10 UV–vis spectra of different concentrations of RhB solutions after 240 min with CNT-1 at different temperatures.

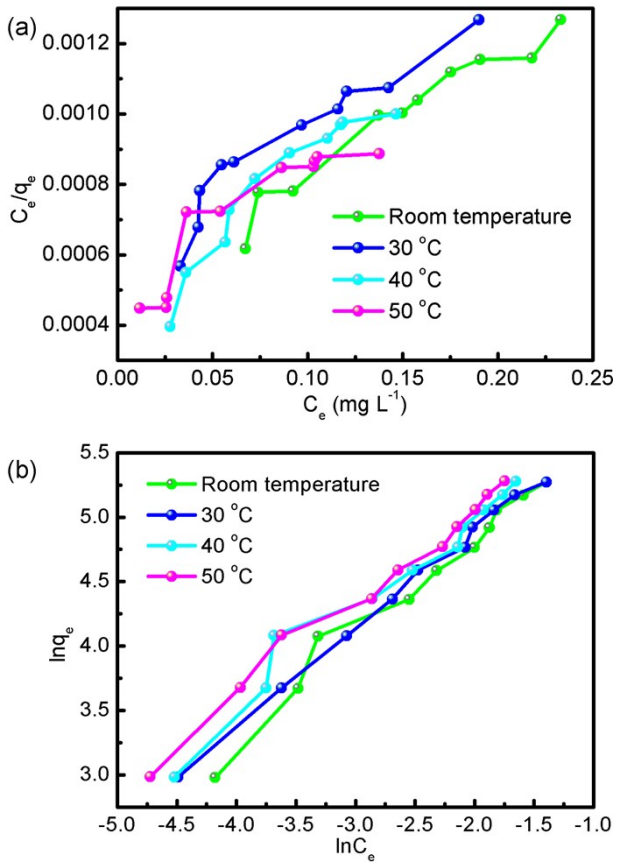

Fig. S11 The equilibrium plot for the adsorption RhB on to the CNT-1: (a) Langmuir model equilibrium plot; (b) Freundlich model equilibrium plot.

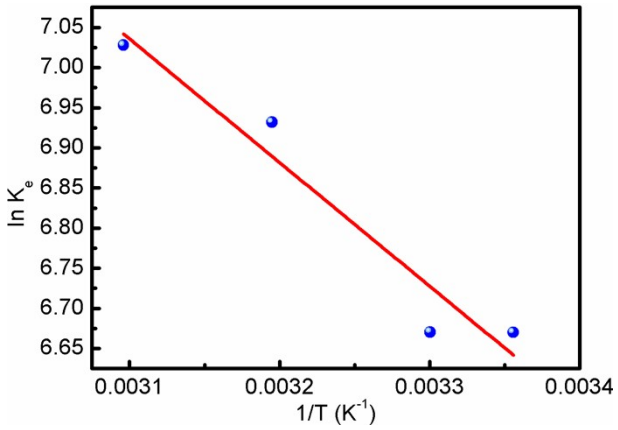

Fig. S12 The plot of lnK_e-1/T for adsorption of RhB on CNT-1.