【Electronic Supplementary Information】

Functionalized monolayers on mesoporous silica and on titania nanoparticles for mercuric sensing

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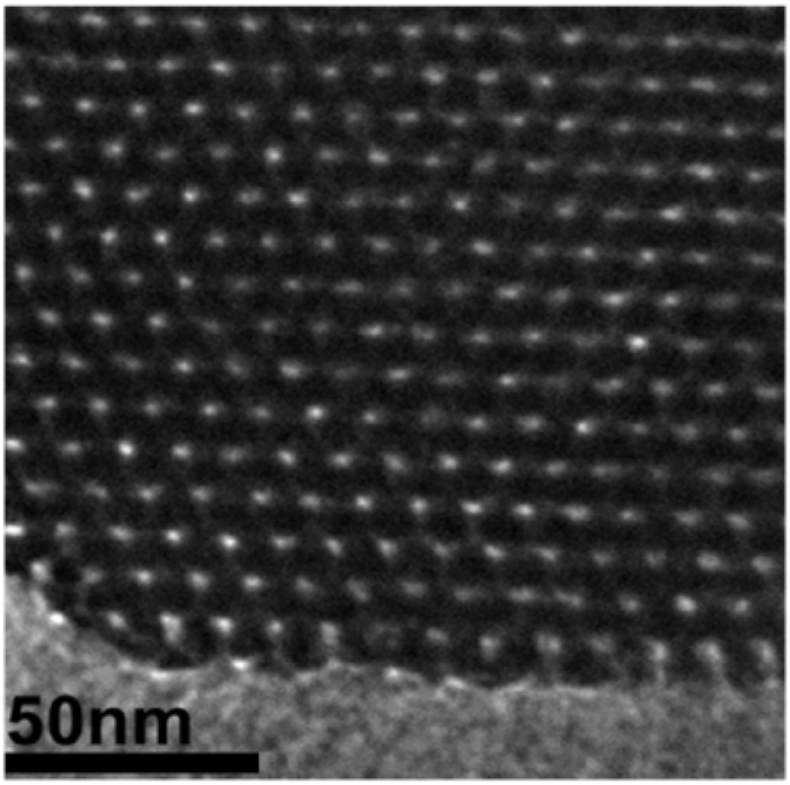

Fig. S1 TEM image of mesoporous silica.

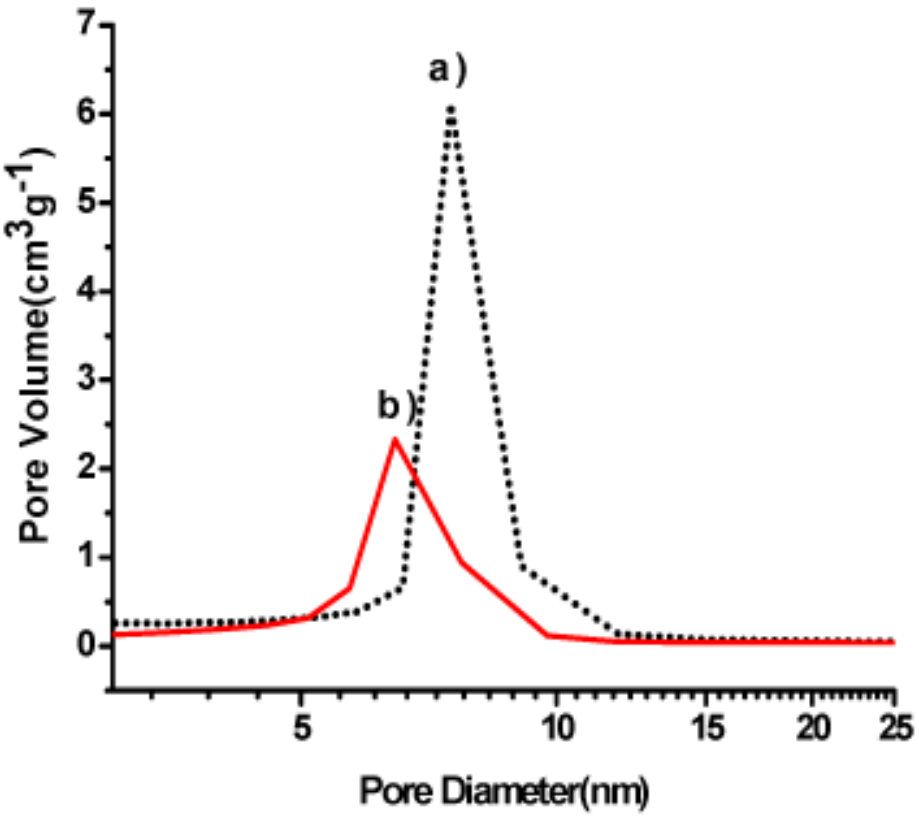

Fig. S2 Barrett-Joyner-Halenda(BJH) pore diameters of (a) mesoporous silica and (b) **AR-SiO$_2$**.

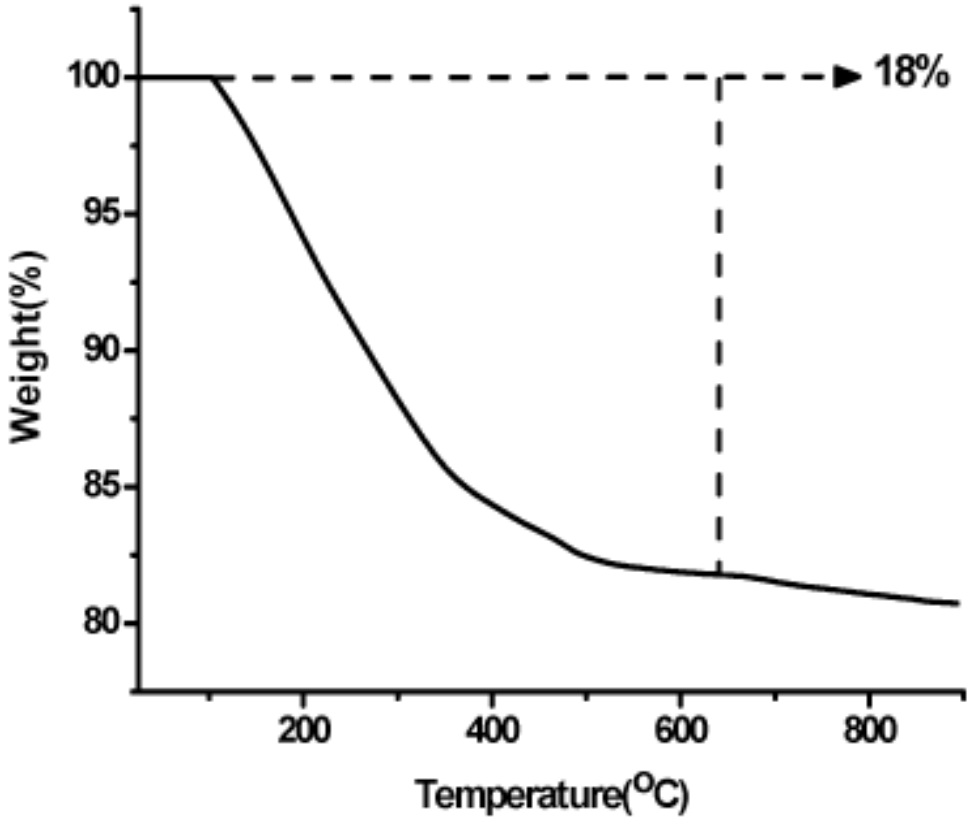

Fig. S3 Thermogravimetric analysis data of **AR-SiO_2**.

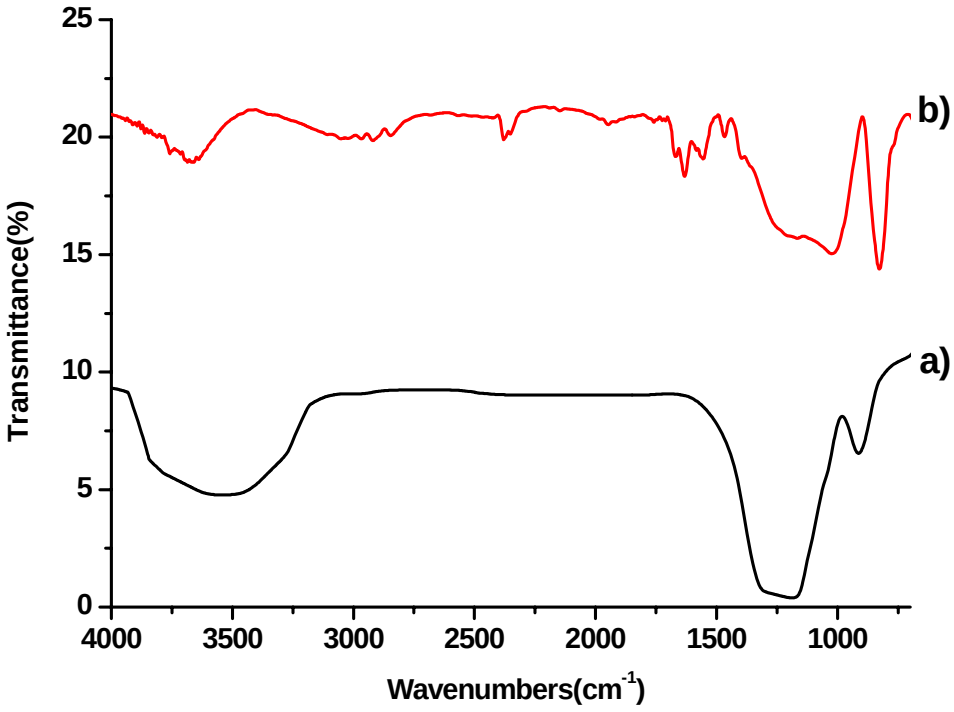

Fig. S4 FT-IR spectra of (a) mesoporous silica (SBA-15) and (b) **AR-SiO$_2$**.

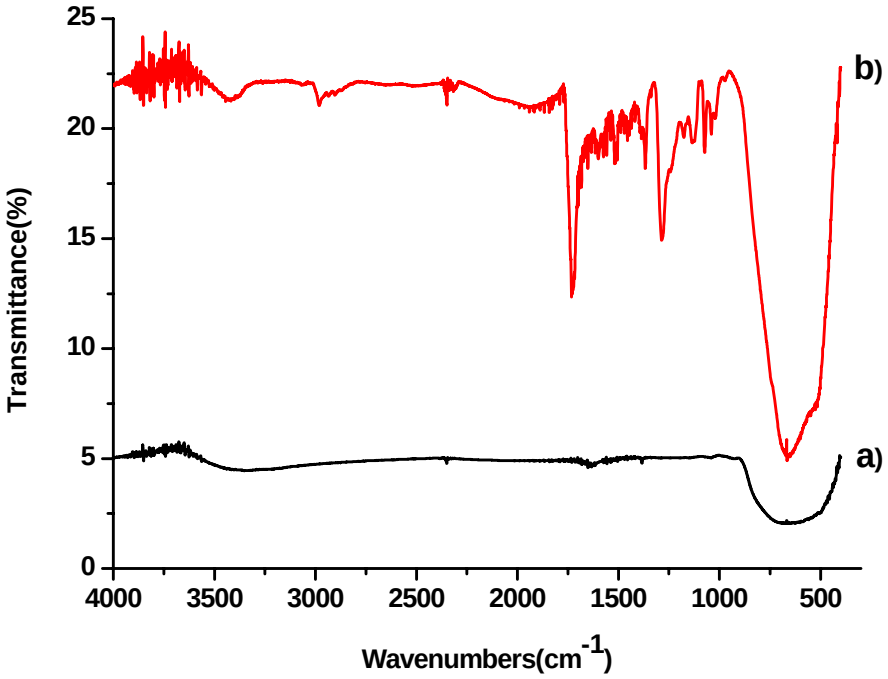

Fig. S5 FT-IR spectra of (a) TiO_2 nanoparticle and (b) **AR-TiO_2**.

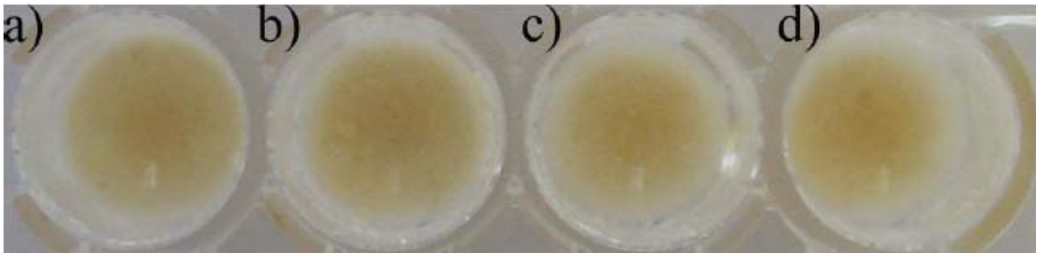

Fig. S6 The colorimetric response of H_2O suspension samples of **AR-SiO$_2$** (5.0 mg) in the (a) absence and the presence of (b) KCl (5.0 equiv), (c) $CaCl_2$ (5.0 equiv) and (d) $SrCl_2$ (5.0 equiv).

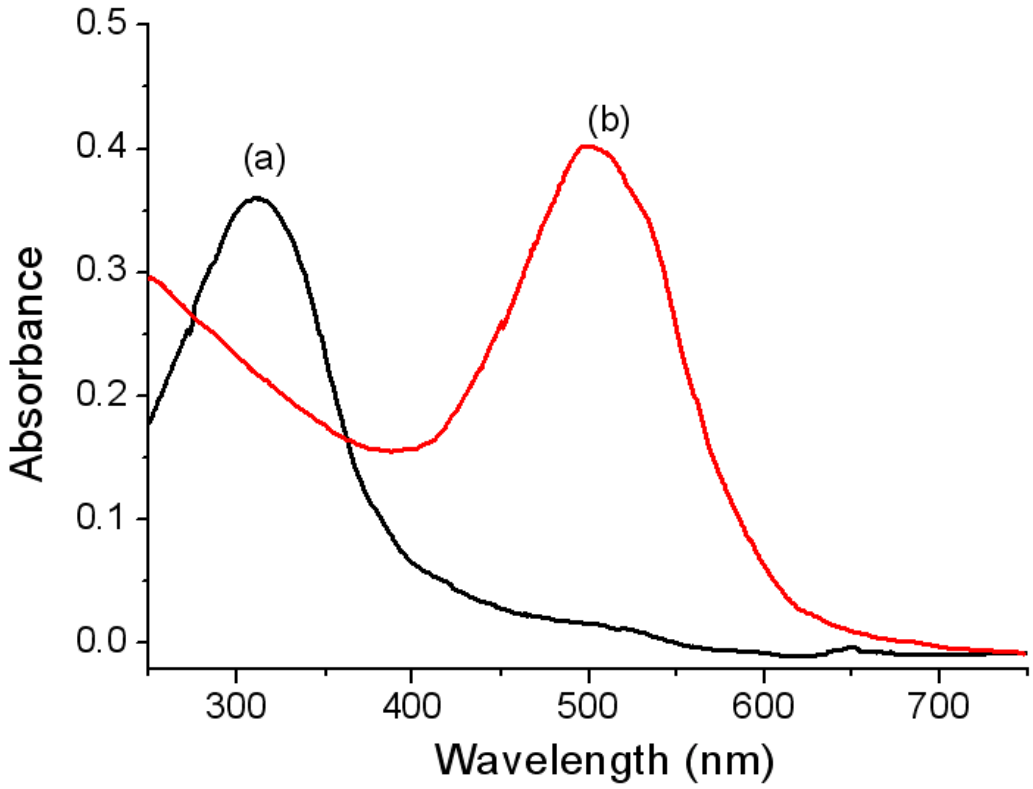

Fig. S7 UV-vis spectrum of **AR-SiO**$_2$ (5.0 mg) with $HgCl_2$ (5.0 equiv) in the presence of K^+, Ca^{2+}, Sr^{2+}, Co^{2+}, Cd^{2+}, Pb^{2+}, Fe^{3+}, Cu^{2+} and Zn^{2+} ions (10 equiv) at pH=7.4.

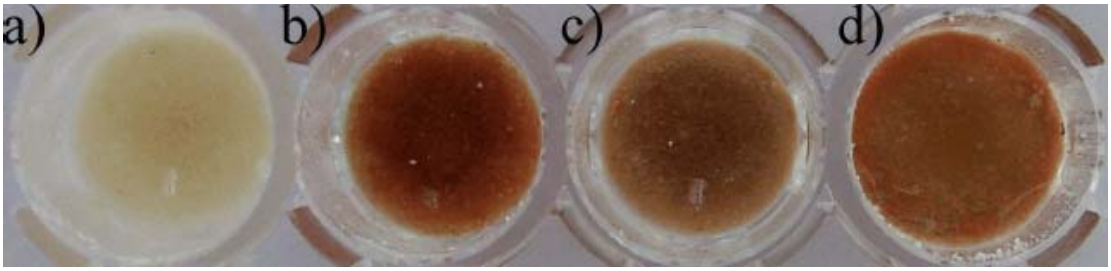

Fig. S8 Color changes of **AR-SiO$_2$** (5.0 mg) in the (a) absence and the presence of (b) $HgBr_2$ (5.0 equiv), (c) $Hg(NO_3)_2$ (5.0 equiv) and (d) $Hg(ClO_4)_2$ (5.0 equiv).

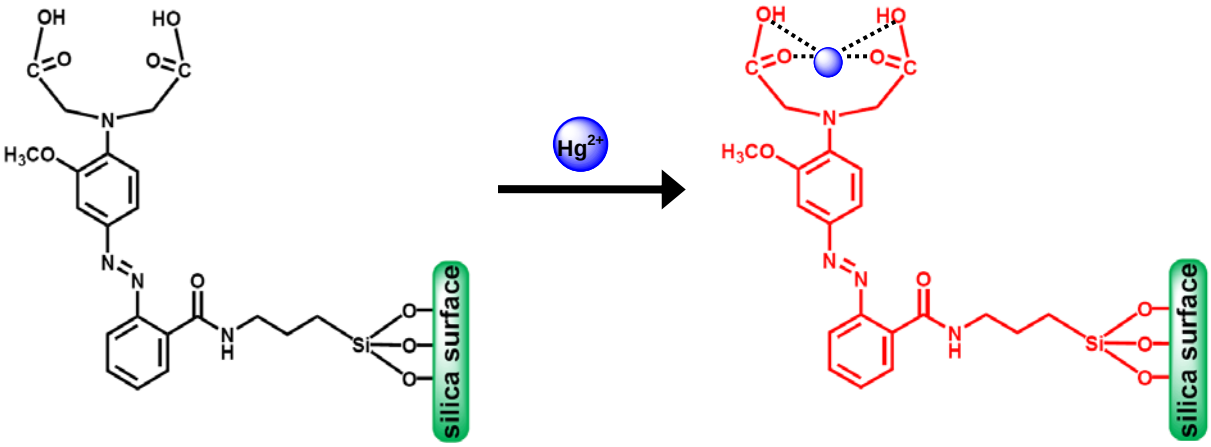

Fig. S9 Proposed structure for receptor **1** complex attached on **AR-SiO$_2$** with Hg^{2+} ion.

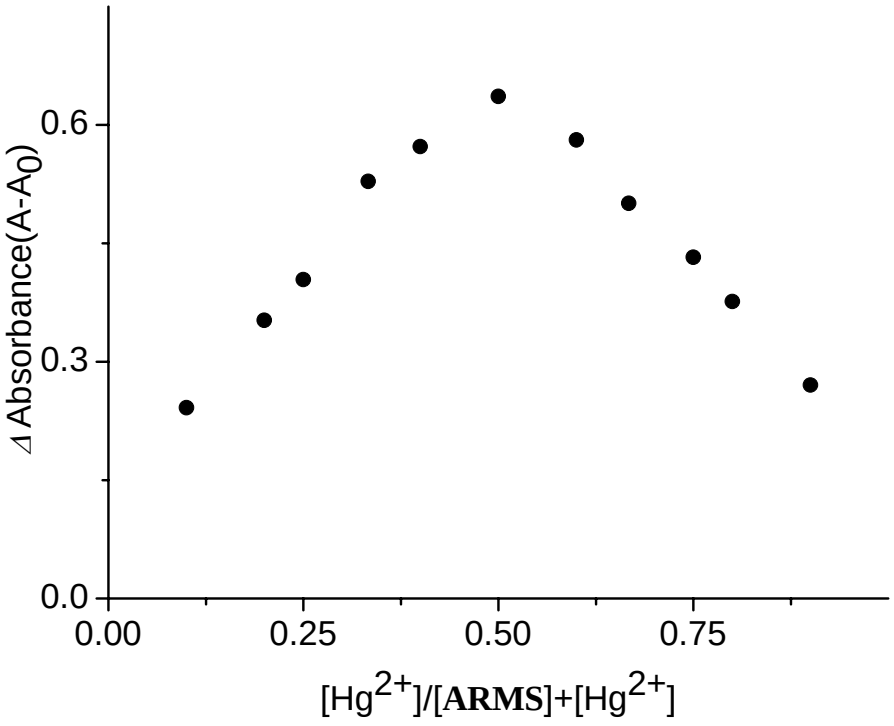

Fig. S10 Job's plot for **AR-SiO$_2$** with Hg^{2+}.

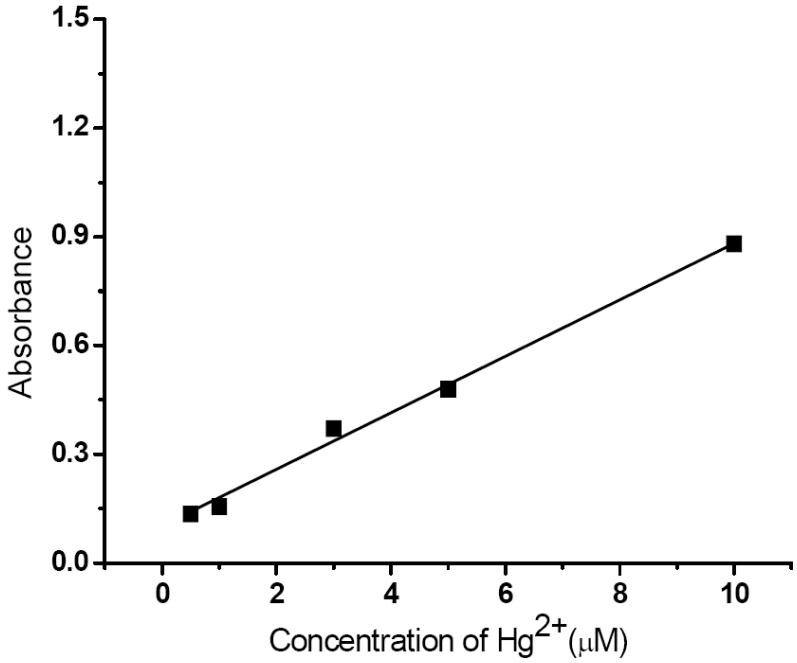

Fig. S11 Calibration curve of concentration of Hg^{2+} ion against absorption intensity of **AR-SiO_2** (at 510 nm).

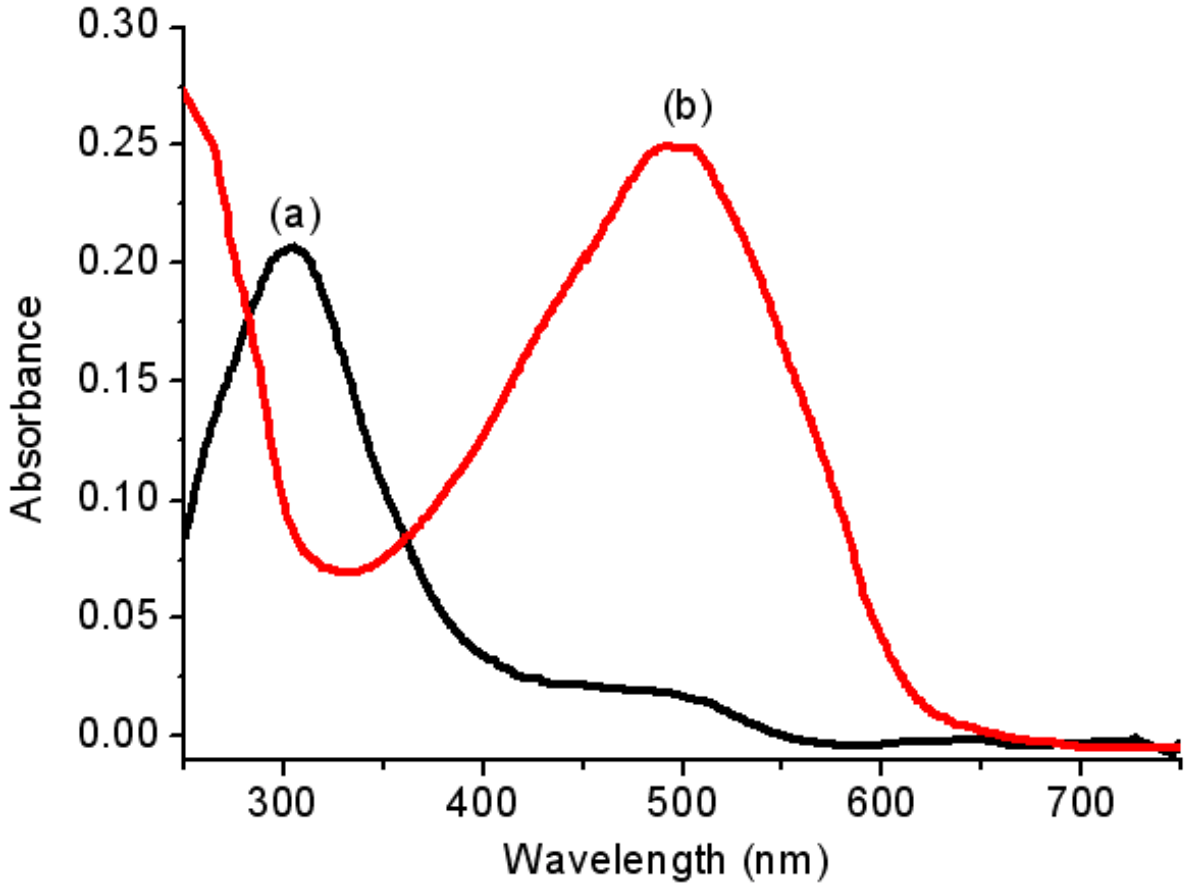

Fig. S12 UV-vis spectrum of **AR-SiO$_2$** (5.0 mg) in waste containing Hg^{2+} ion (2.0 μM) at pH=7.4.

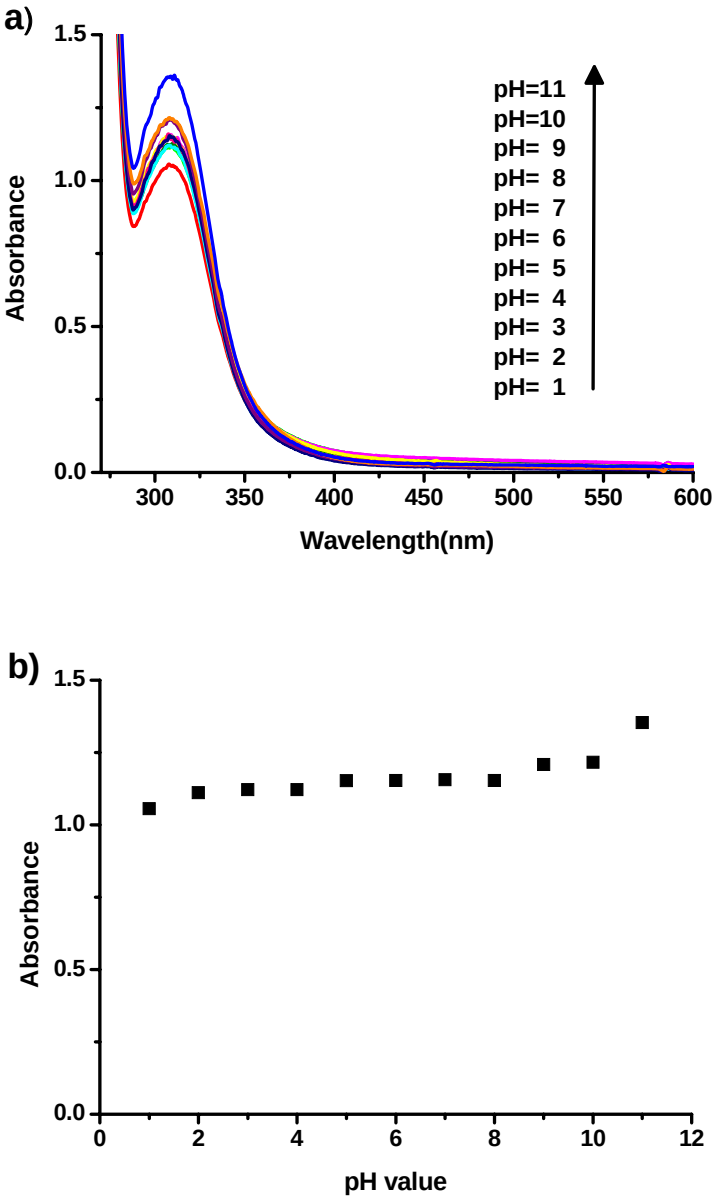

Fig. S13 (a) UV-vis spectra of **AR-SiO$_2$** at different pH values and (b) plot of pH values against absorption intensity of **AR-SiO$_2$**.

Fig. S14 Image of **AR-TiO_2** films in the (a) absence and (b) the presence of $HgCl_2$.

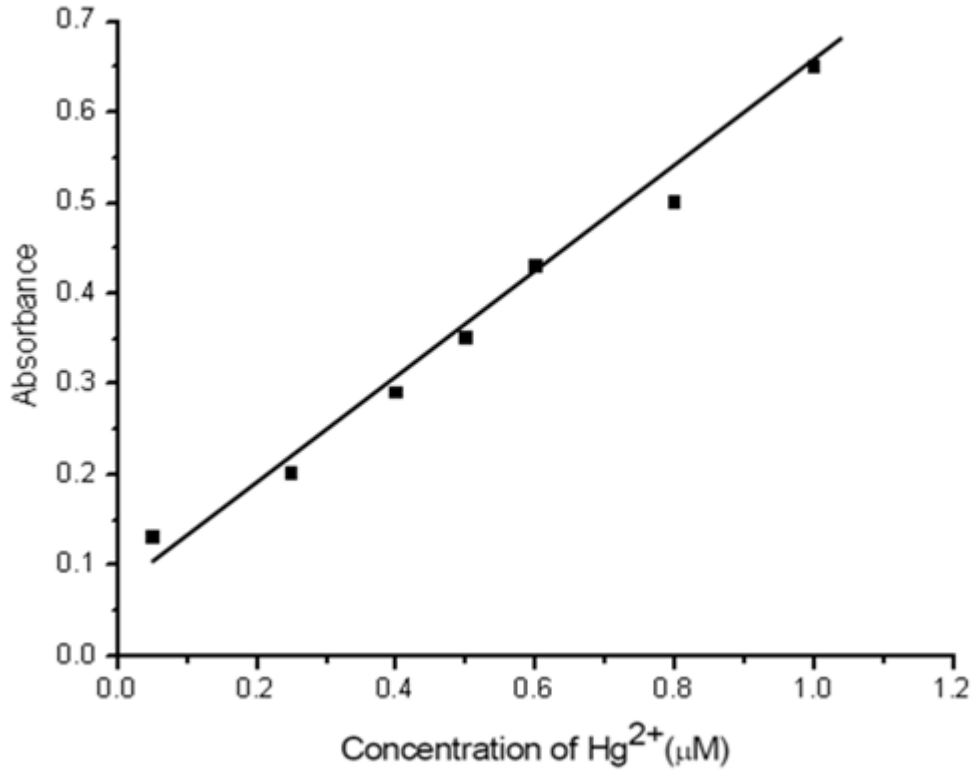

Fig. S15 Calibration curve of concentration of Hg^{2+} ion against absorption intensity of **AR-TiO_2** films (at 492 nm).