ELECTRONIC SUPPLEMENTARY INFORMATION

$CsPbBr_3$ Perovskite Nanocrystals as Highly Selective and Sensitive Spectrochemical Probes for HCl Detection

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Supporting Figures

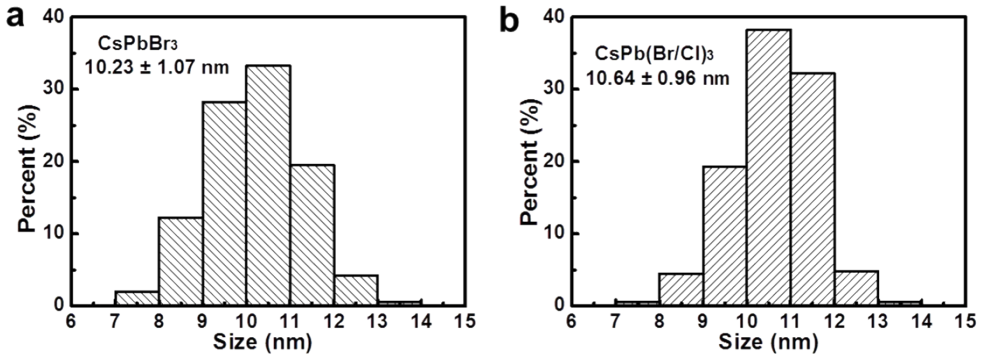

Figure S1. Size distributions of the $CsPbBr_3$ nanocrystals (a) as-synthesized nanocrystals and (b) HCl-treated nanocrystals.

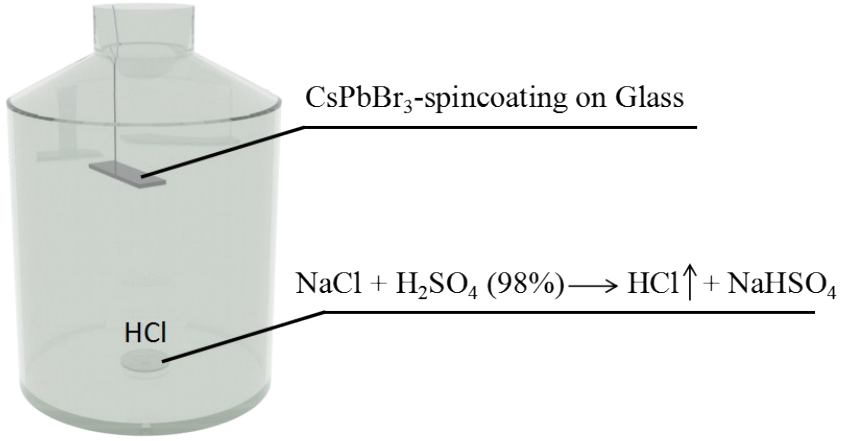

Figure S2. Schematic diagram of experimental set-up

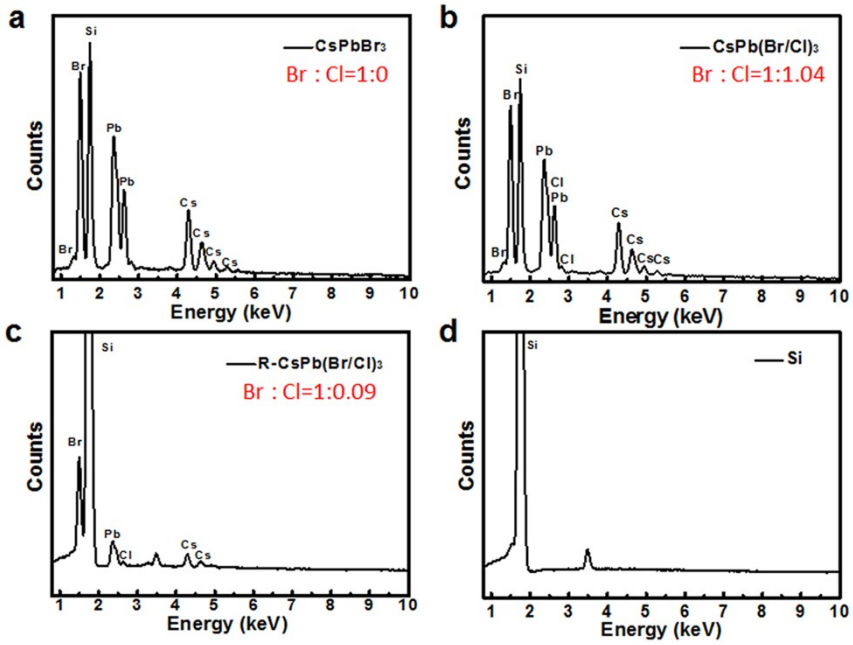

Figure S3. The energy dispersive spectrometry (EDS) results of $CsPbBr_3$ nanocrystals as the spectrochemical probes for detection of HCl vapor. (a) $CsPbBr_3$; (b) $CsPb(Br/Cl)_3$ with Br/Cl ration of 1:1.04; (c) R-$CsPb(Br/Cl)_3$ with Br/Cl ration of 1:0.09; (d) the silicon substrate.

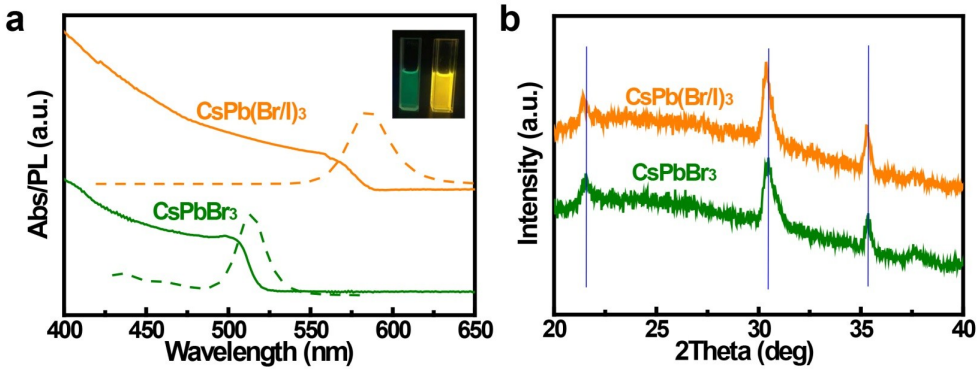

Figure S4. The $CsPbBr_3$ nanocrystals as the spectrochemical probes for detection of HI vapor: (a) PL spectra and UV-vis absorption of $CsPbBr_3$ nanocrystals exposed to HI for 60 minutes. (b) XRD patterns of the as-synthesized $CsPbBr_3$ and $CsPb(Br/I)_3$.

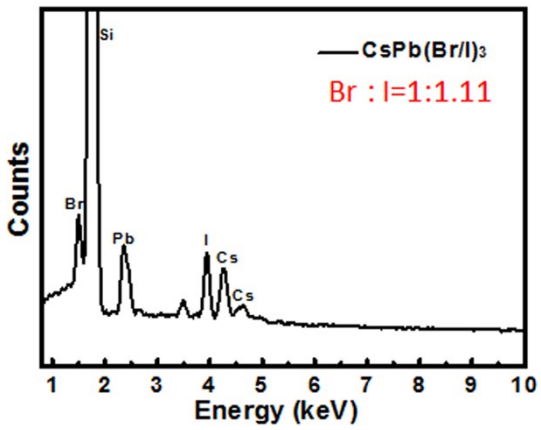

Figure S5. The EDS result of $CsPb(Br/I)_3$ supported on Si slide.

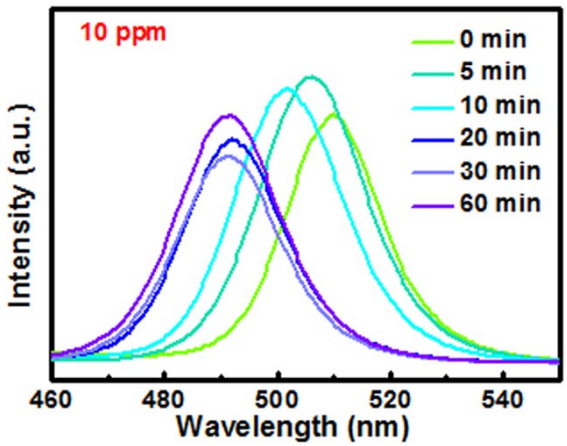

Figure S6. The non-normalized PL spectra of $CsPbBr_3$ nanocrystals exposed to 10 ppm HCl as a function of time.

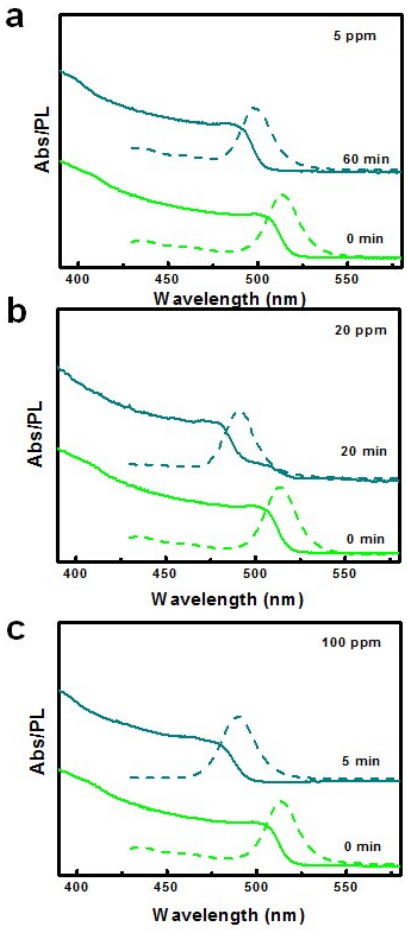

Figure S7. PL and UV-vis absorption spectra of $CsPbBr_3$ nanocrystal exposed to HCl vapor with concentrations of (a) 5 ppm, (b) 20 ppm and (c) 100 ppm.

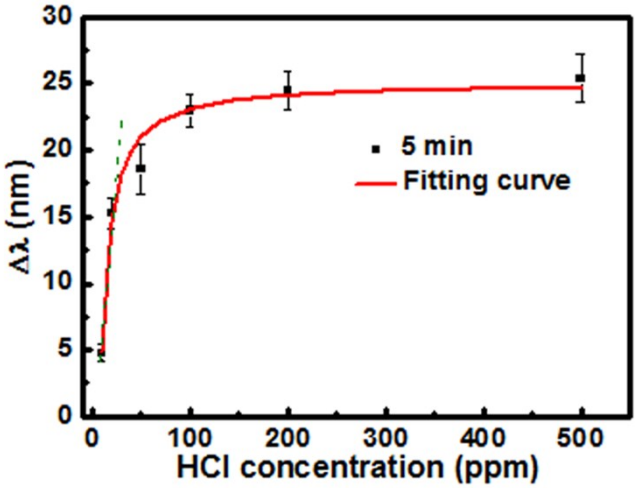

Figure S8. The response of the shift of PL peak position nanocrystals exposed to HCl vapor for $CsPbBr_3$ with various concentrations for 5 min reaction.

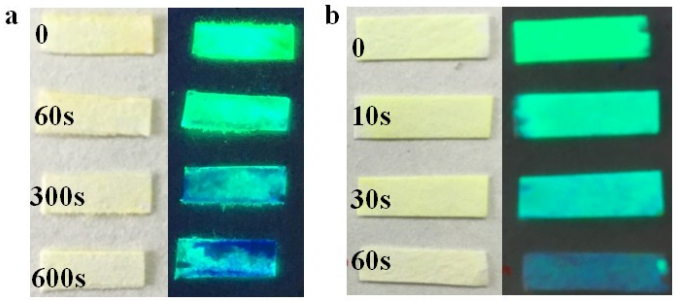

Figure S9. Photography images of the filter paper based $CsPbBr_3$ nanocrystal chemical sensors exposed to HCl vapor (5 and 10 ppm) for various times.