Supporting information

Single step reduction of silver ions across metal organic framework templates under gamma irradiation

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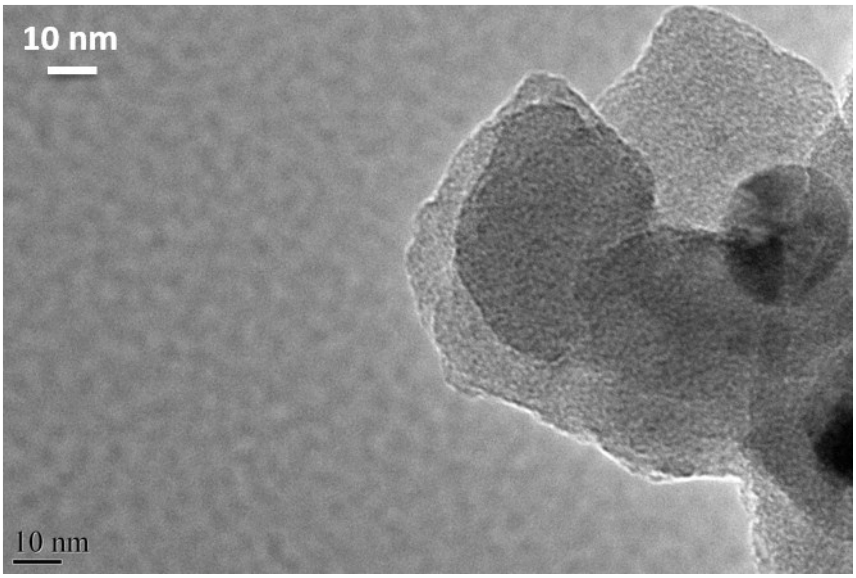

Figure S1 TEM of HKUST-1 crystals

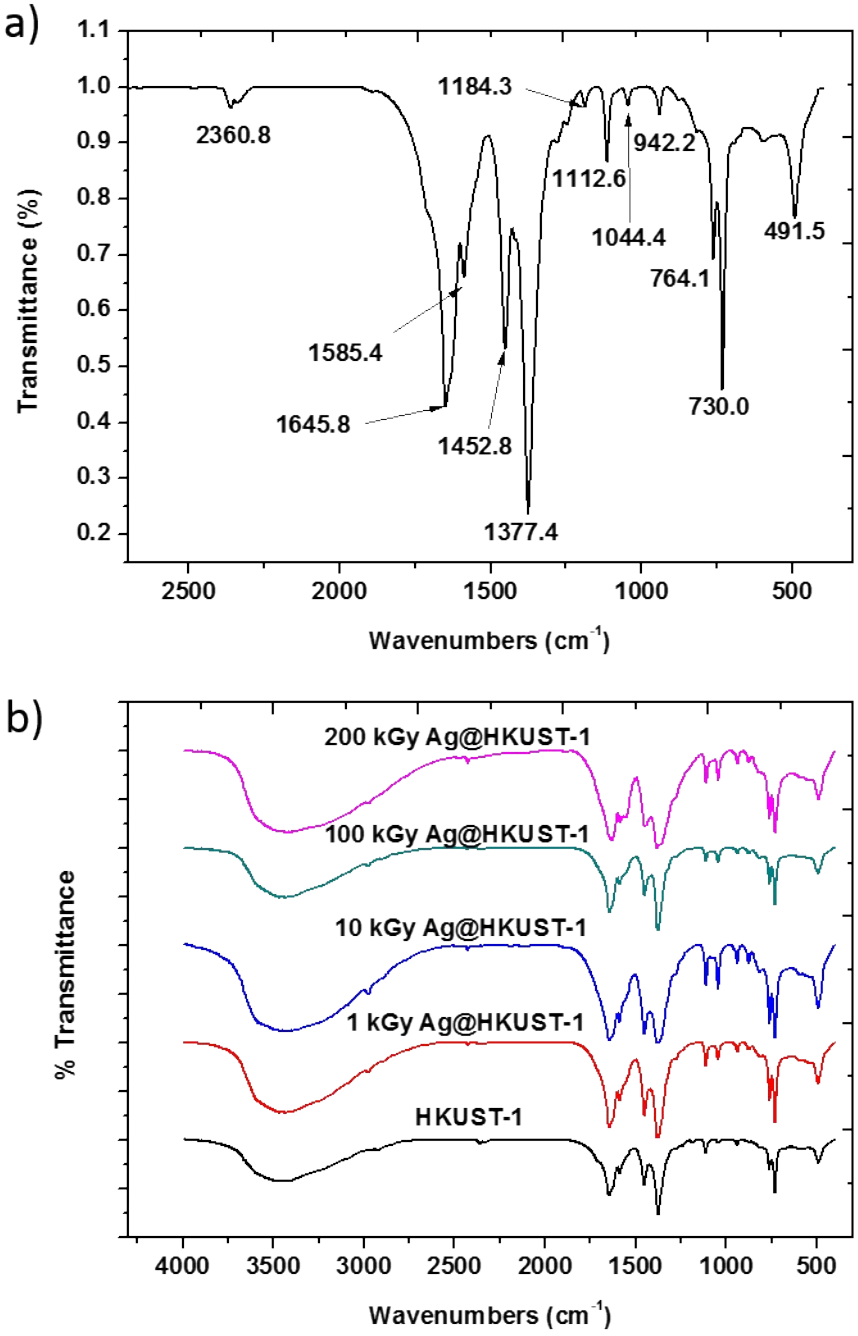

Figure S2 FTIR spectrum of a) HKUST-1 crystals b) Ag@HKUST-1 with different irradiation doses.

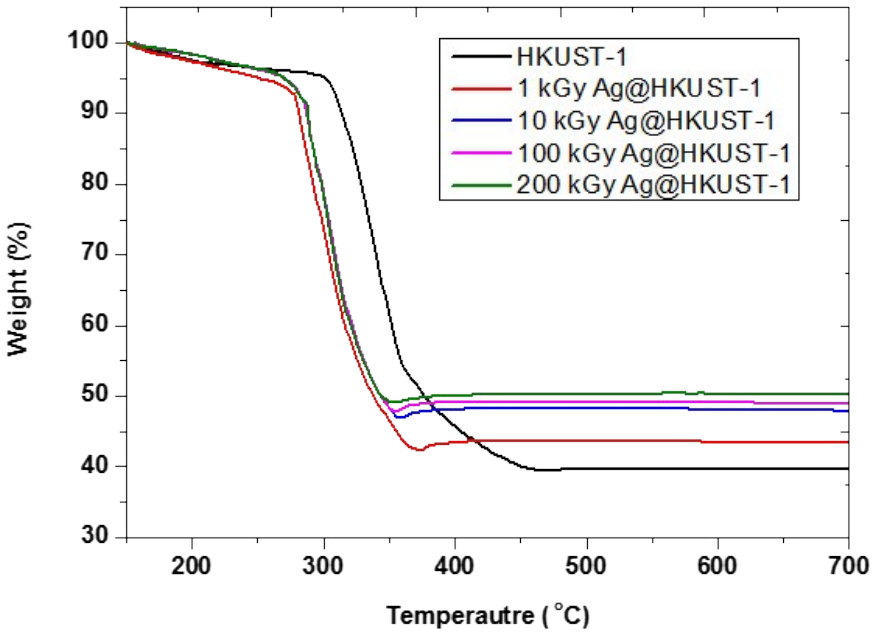

Figure S3 TGA results of Ag@HKUST-1 crystals with different loadings of Ag

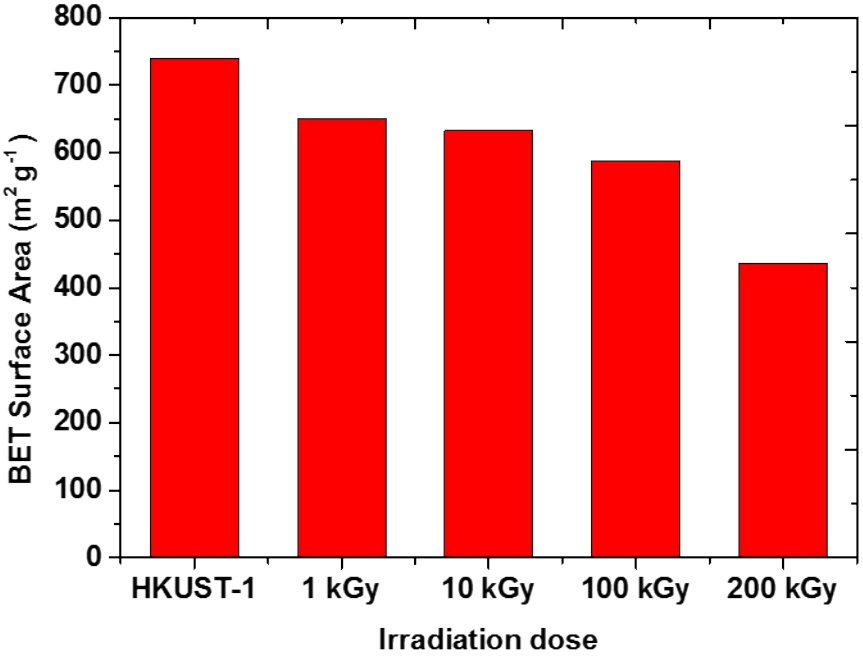

Figure S4 BET surface area of Ag@HKUST-1 crystals

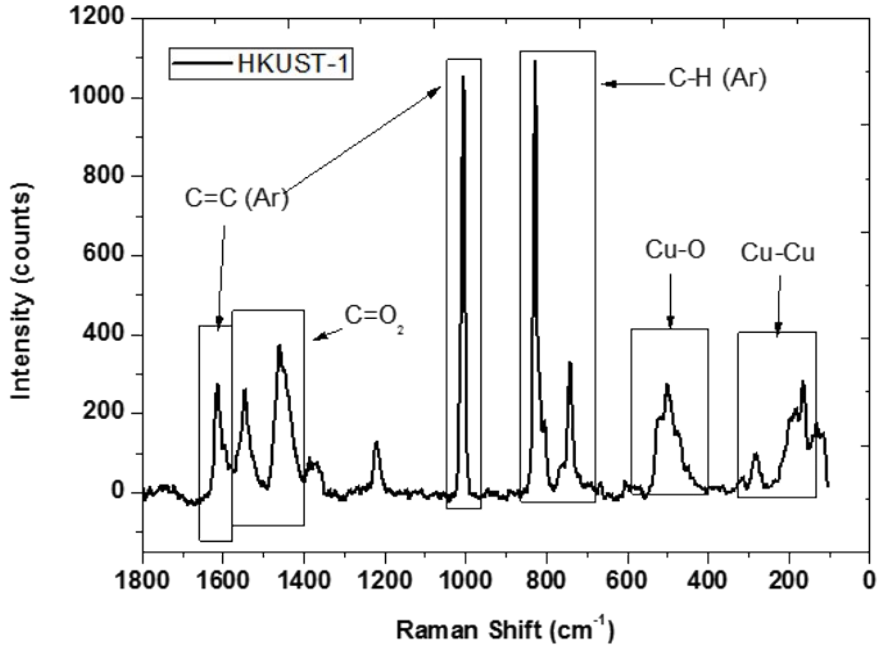

Figure S5 Raman spectra of HKUST-1 with a λ=514 nm

As shown in **Figure S6**, in the absence of any catalysts, the 4-NP solution normally exhibits an absorbance peak at 317 nm, when exposed to freshly prepared $NaBH_4$ reducing agents, the 4-NP absorption peak immediately reduced and a new peak at 400 nm was formed. This shift was due to the formation of 4-nitrophenolate ions, subsequently leading to a sharp colour change from yellow to dark yellow-green. Small concentrations of Ag@HKUST-1 crystals were used in these tests to properly evaluate the kinetics of degradation by in-situ recording the absorption spectra peak intensity change of 4-NP. The reduction process was therefore visualized through the progressive disappearance of the 400 nm peak corresponding with the concomitant appearance of the new peak at 300 nm.

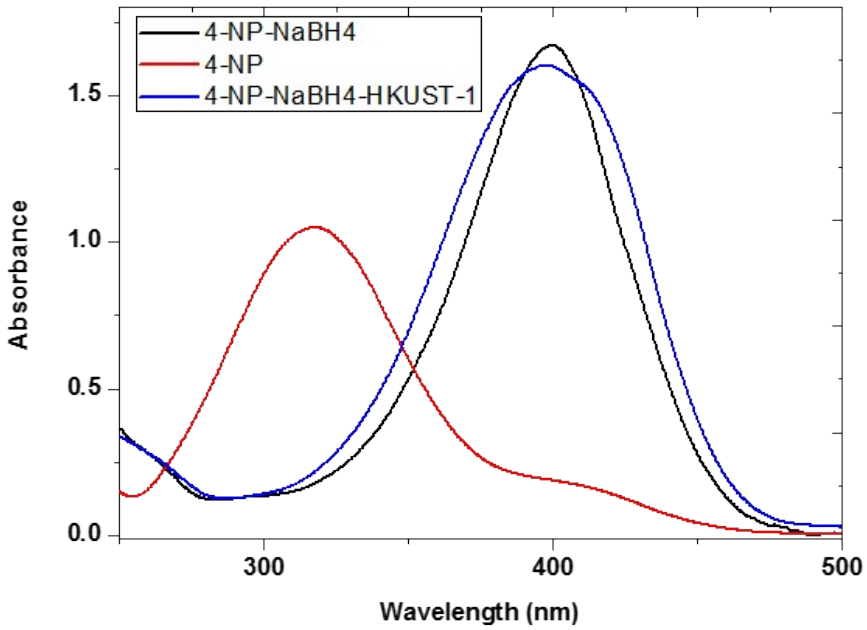

Figure S6 UV-vis spectra of 4-NP (red), 4-NP with $NaBH_4$ (black) and HKUST-1 with 4-NP and $NaBH_4$ (blue)

Figure S7 100 kGy Ag@HKUST-1 after 5 cycle

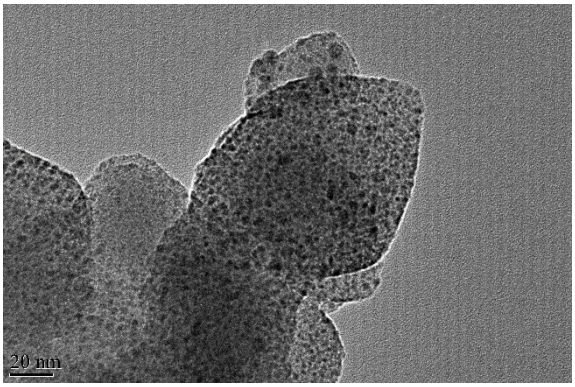

Figure S8 100 kGy Ag@HKUST-1 after 5 cycle