Facet-specific photoreduction and immobilization of Cr(VI) on hematite nanocrystals

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Fig. S1.SEM images of HNPs (a) and HNCs (b).

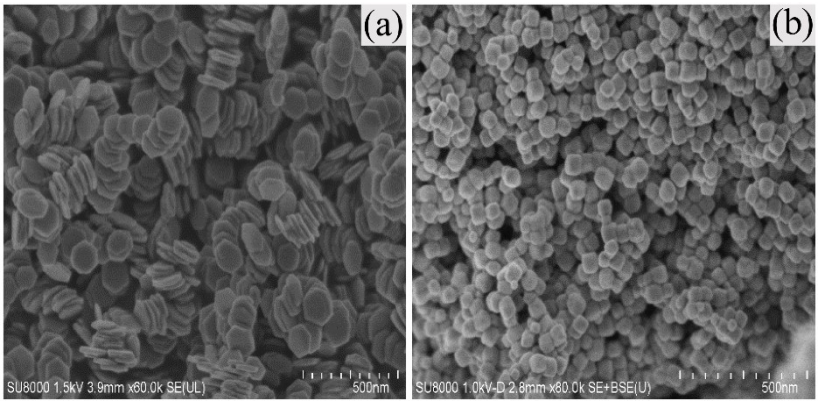


Fig. S2. N_2 adsorption/desorption curves of HNPs (a) and HNCs (b); Tauc plots of HNPs and HNCs (c)

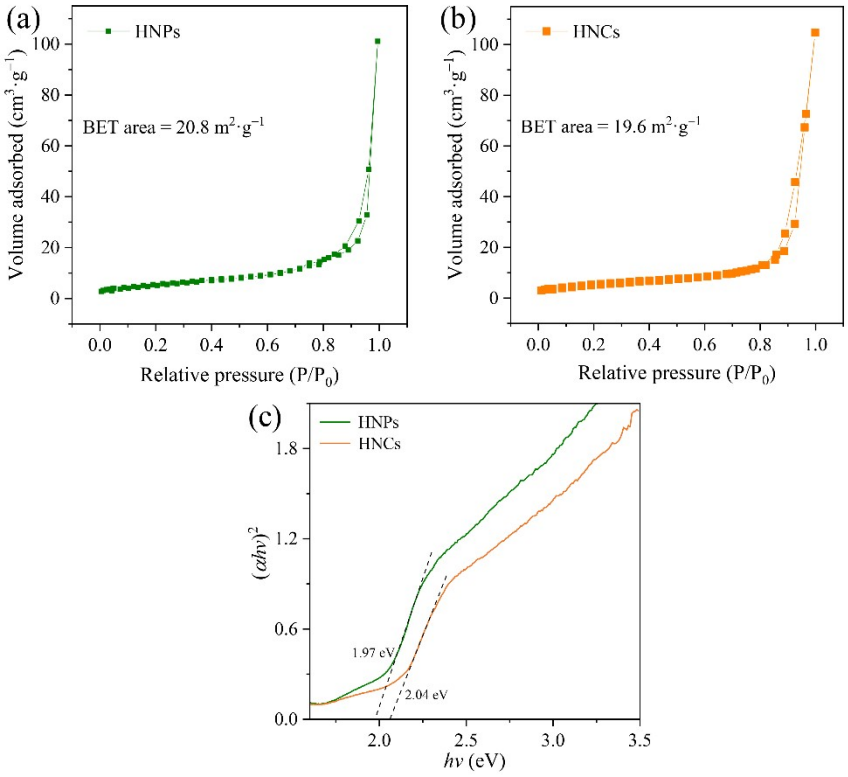
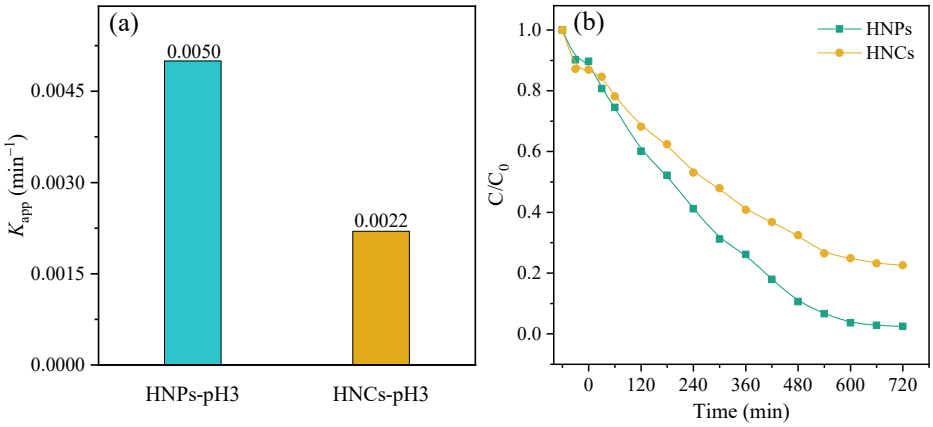


Fig. S3. (a) apparent reaction rate constant (K_{app}) for the reduction of Cr(VI) by HNPs and HNCs at pH 3; (b)The removal kinetics of Cr(VI) on HNPs and HNCs at pH 3 after



720 min (approaches reaction equilibrium).

Fig. S4. XPS spectra of Cr 2p3/2 for HNPs (a,b) and HNCs (c,d) after reaction at pH 4 and 5, respectively.

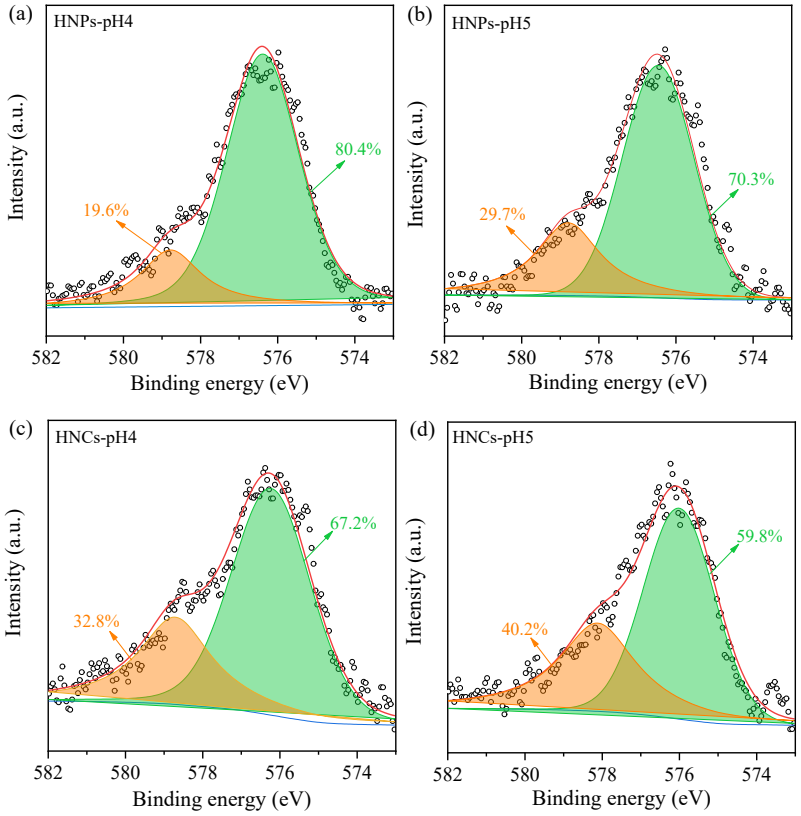


Fig. S5. Concentration of Cr(VI) and total Cr in solution after reaction at different initial pH.

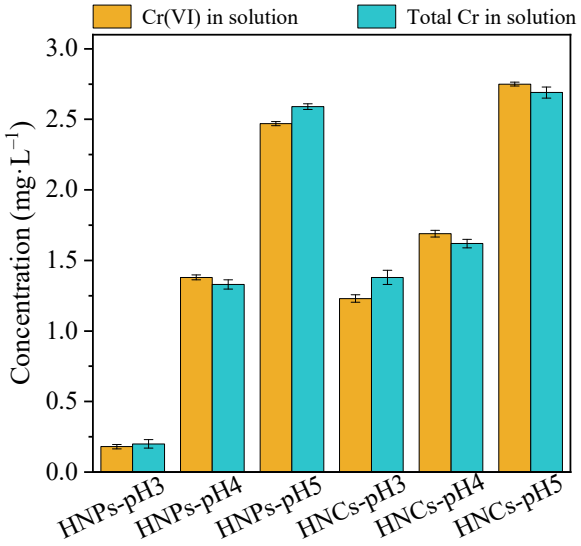


Fig. S6. EDS spectra of HNPs and HNCs after reaction at pH 3.

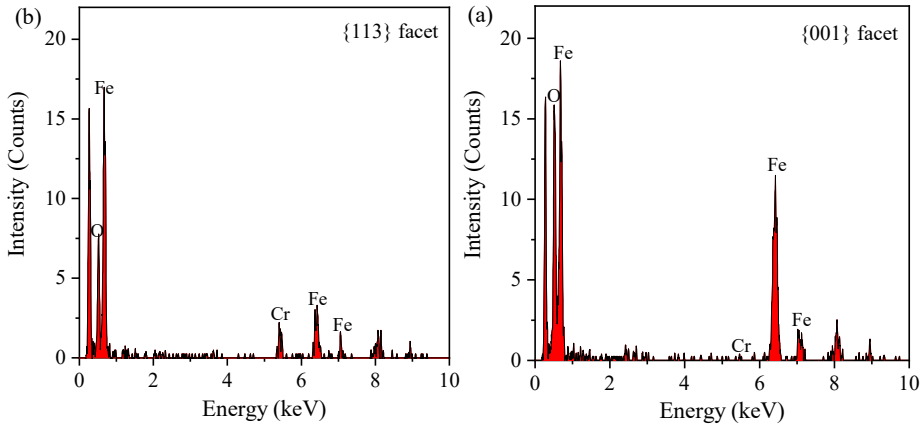


Fig. S7. (a) HAADF-STEM image of HNPs, (b) EELS spectra of the two samples extracted from the marked area in the STEM images.

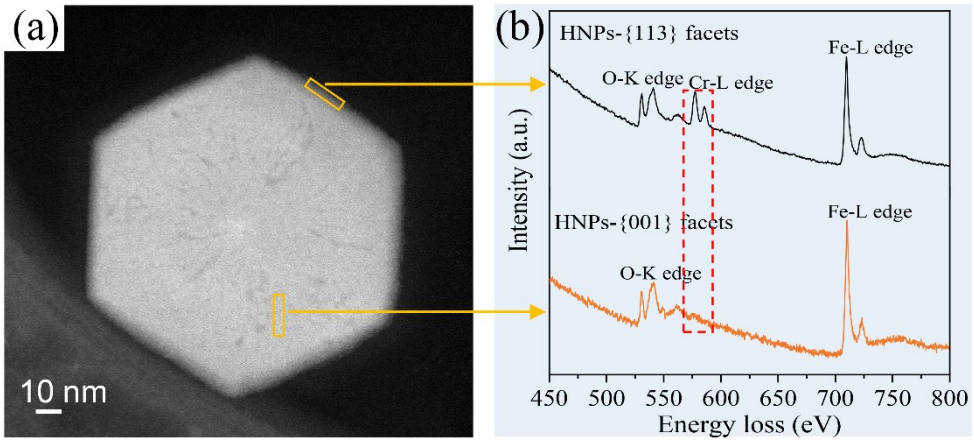


Fig. S8. Desorption of the Cr(VI) and total Cr that immobilized by HNPs or HNCs in the dark versus under light irradiation

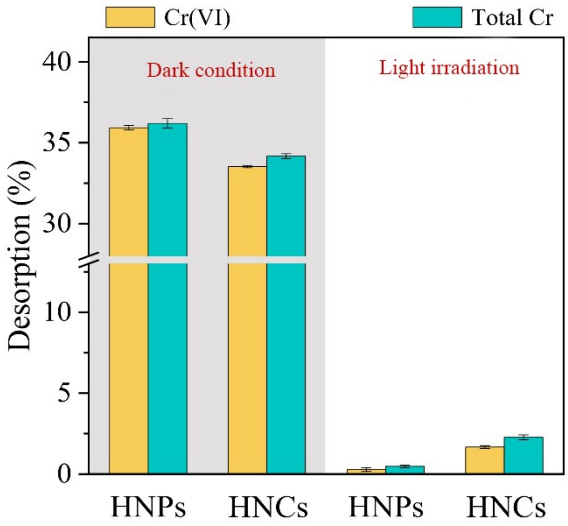


Fig. S9. Calculated electrostatic potentials for (a) {001} and (b) {113} facets (the bottom cartoons are the DFT-optimized structure model of the corresponding facets).

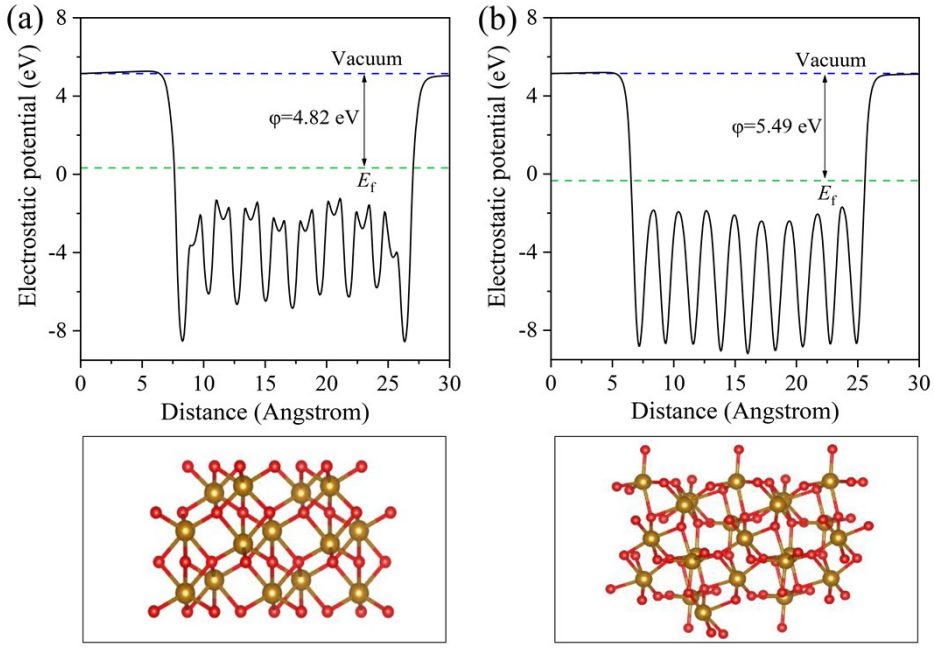


Fig. S10. (a) Radical quenching experiments during Cr(VI) reduction over HNPs and HNCs uunder light irradiation; (b) ESR spectra of DMPO-•O_2^- in the HNPs and HNCs photochemical systems.