

Nitrogen doped graphene quantum dots as cocatalyst of SrTiO₃(Al)/CoO_x for photocatalytic overall water splitting

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Results

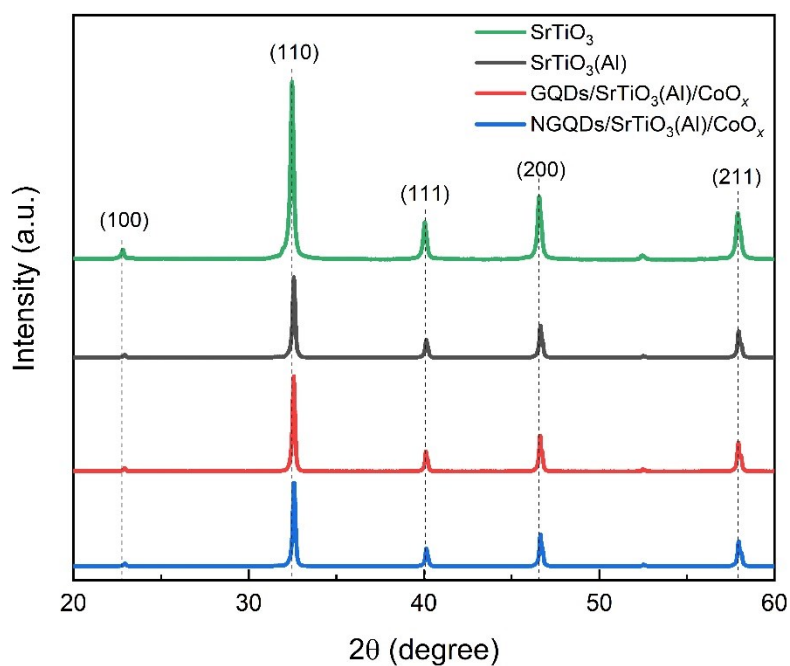


Fig. S1 XRD patterns of pristine SrTiO₃, SrTiO₃(Al), GQDs/SrTiO₃(Al) and NGQDs/SrTiO₃(Al)

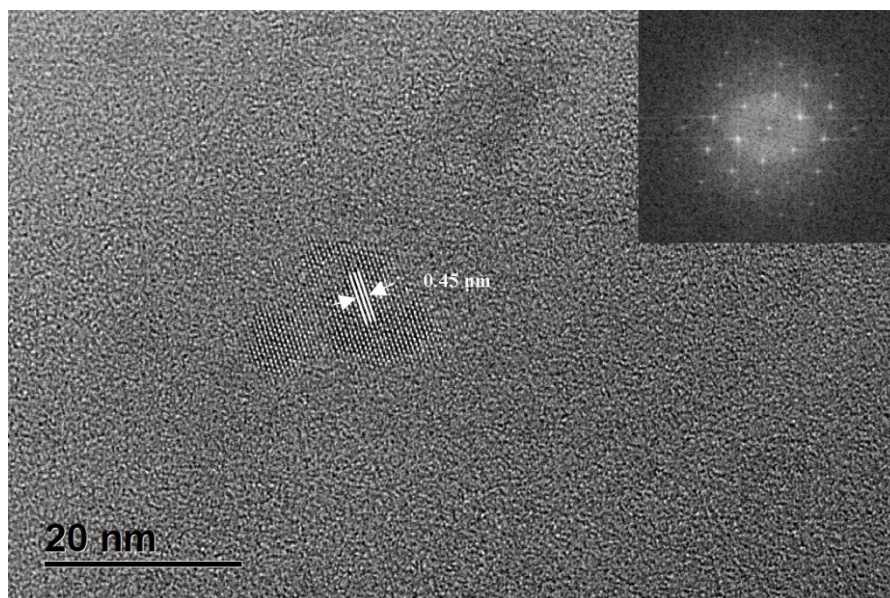


Fig. S2 HRTEM image of NGQDs, and the FFT pattern shown in the inset image

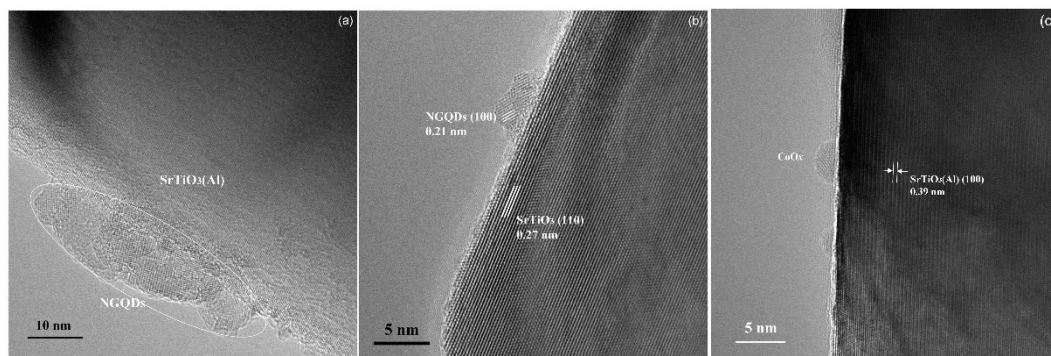


Fig. S3 HRTEM images of NGQDs/SrTiO₃(Al) (a), (b) and HRTEM image of SrTiO₃(Al)/CoO_x (c)

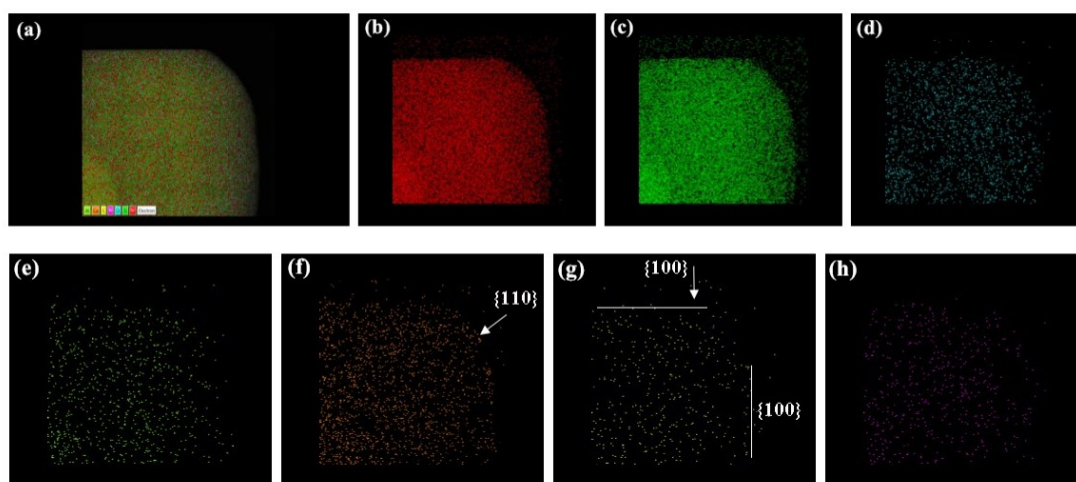


Fig. S4 STEM-mapping patterns of all elements (a), Sr (b), Ti (c), O (d), Al (e), Co (f), C (g), and N (h) of NGQDs/SrTiO₃(Al)/CoO_x

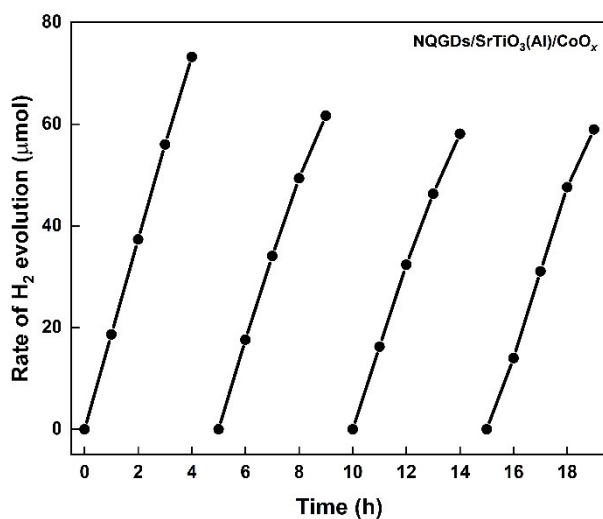


Fig. S5 Stability plots of NGQDs/SrTiO₃(Al)/CoO_x photocatalyst

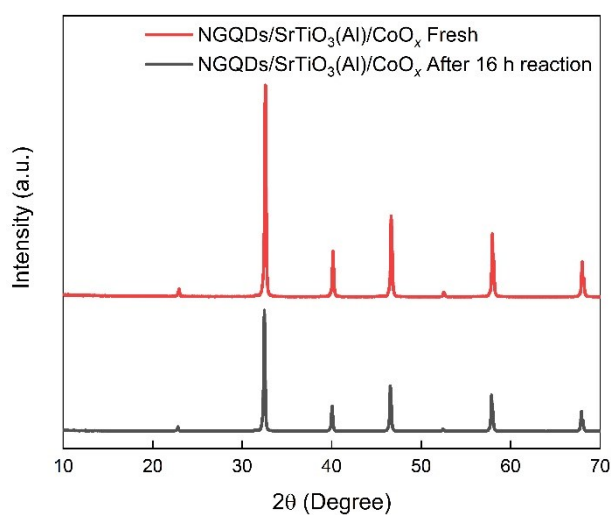


Fig. S6 XRD patterns of fresh and reacted NGQDs/SrTiO₃(Al)/CoO_x

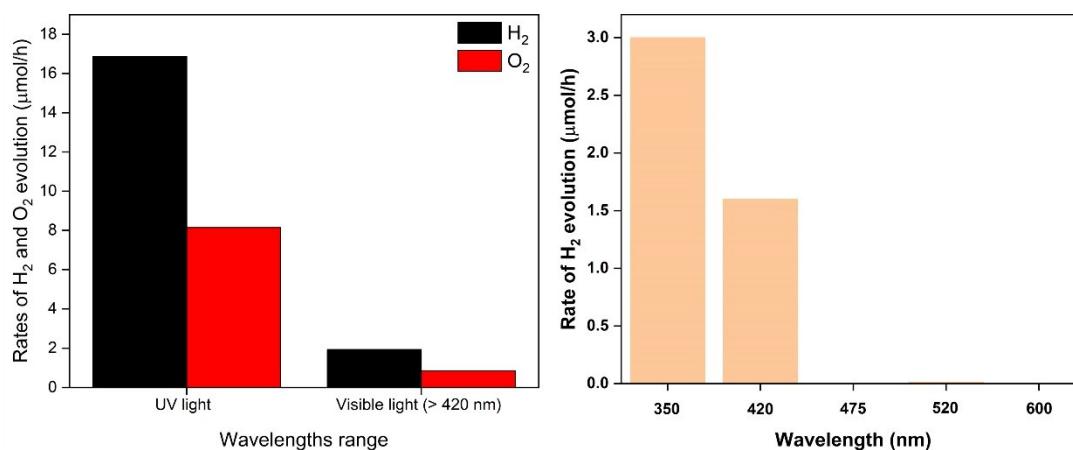


Fig. S7 The photocatalytic overall water splitting activities of NGQDs/SrTiO₃(Al)/CoO_x under UV light and visible light (> 420 nm) (a) and the H₂ evolution rates of NGQDs/SrTiO₃(Al)/CoO_x photocatalyst for overall water

splitting under different central wavelengths irradiation (b)

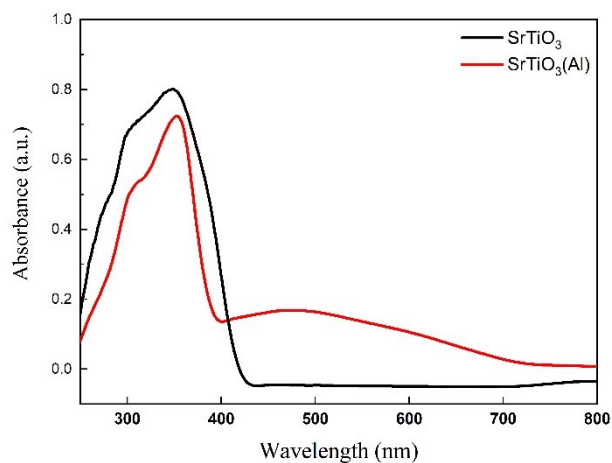
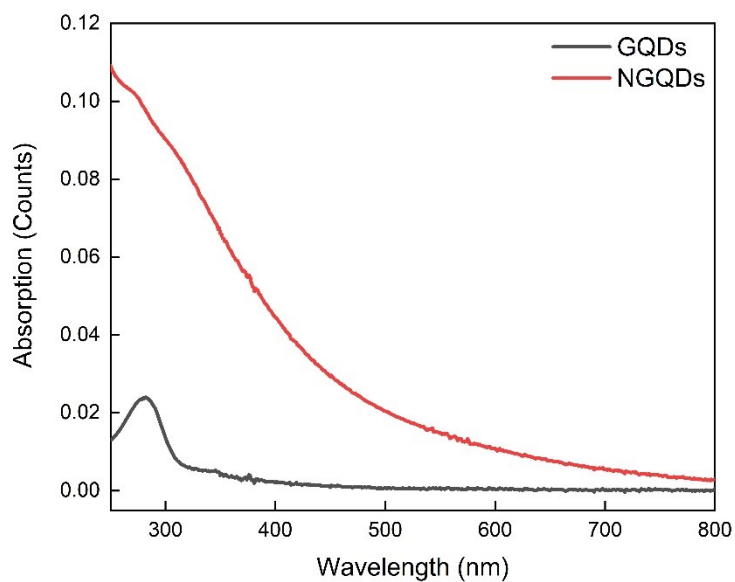
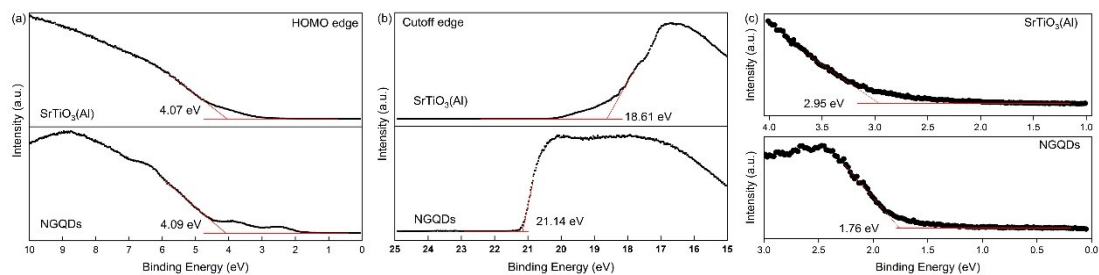
Fig. S8 UV-vis DRS spectra of pristine SrTiO₃ and SrTiO₃(Al)

Fig. S9 UV-vis spectra of pristine GQDs and NGQDs

Fig. S10 HOMO edges (a), cutoff edges (b) and the energy difference between E_{VBM} and the Fermi level (c) ofSrTiO₃(Al) and NGQDs in UPS spectra

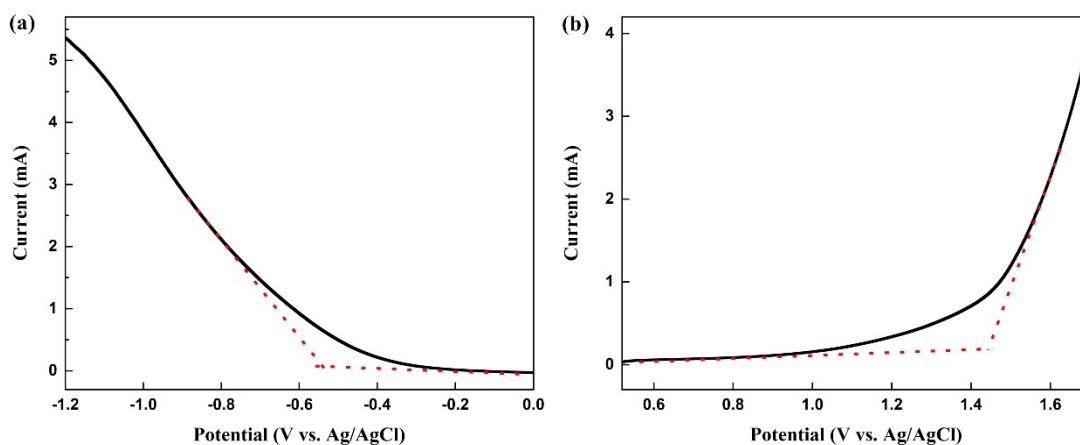
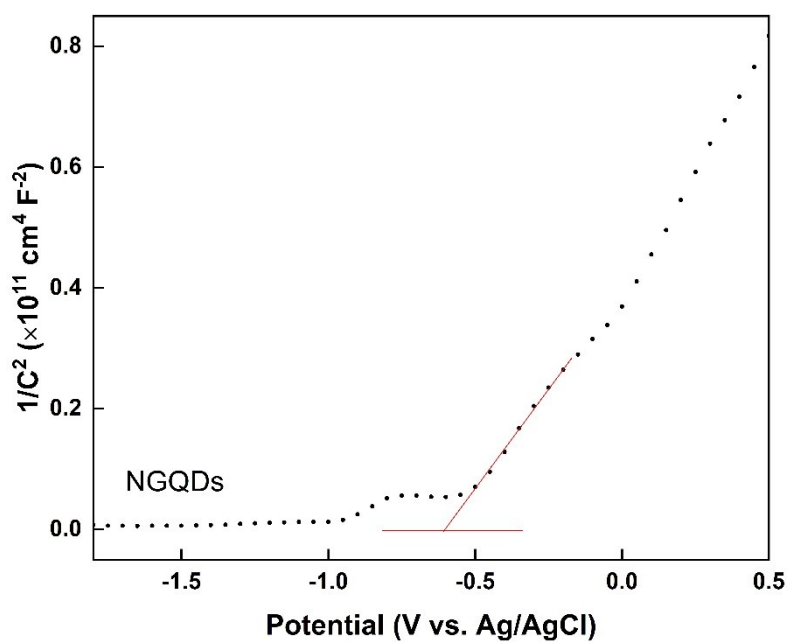
Fig. S11 LSV plots of NGQDs with slow scan rate 5 mV s^{-1} 

Fig. S12 Mott-Schottky plot of NGQDs

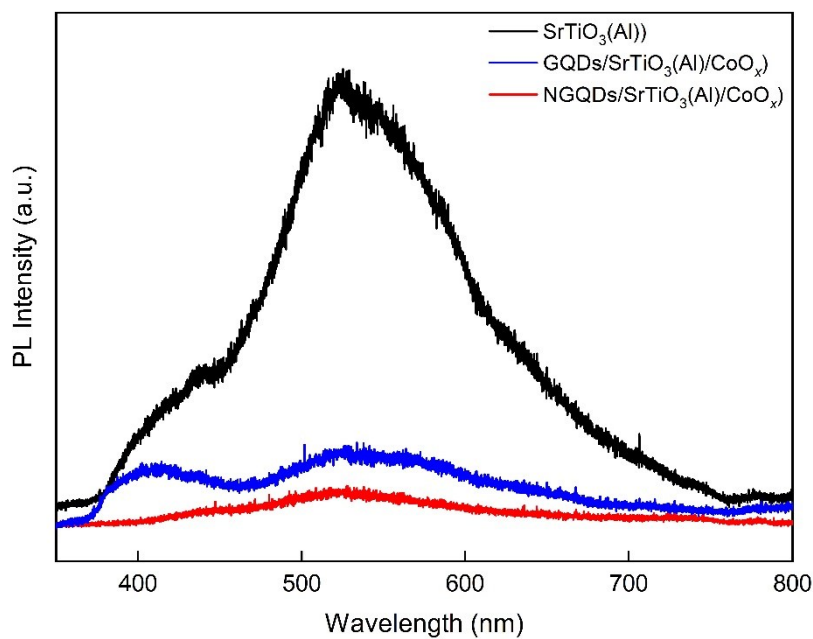


Fig. S13 PL plots of SrTiO₃(Al), GQDs/SrTiO₃(Al)/CoO_x, and NGQDs/SrTiO₃(Al)/CoO_x.

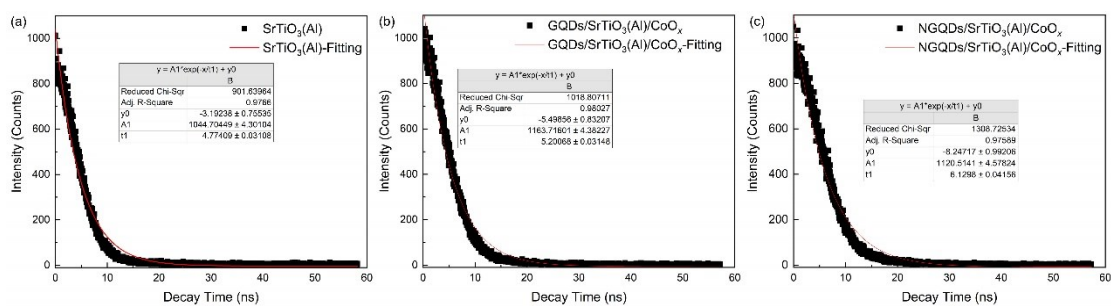


Fig. S14 Fluorescence decay of SrTiO₃(Al) (a), GQDs/SrTiO₃(Al)/CoO_x (b) and NGQDs/SrTiO₃(Al)/CoO_x (c) by single exponential function fitting