Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

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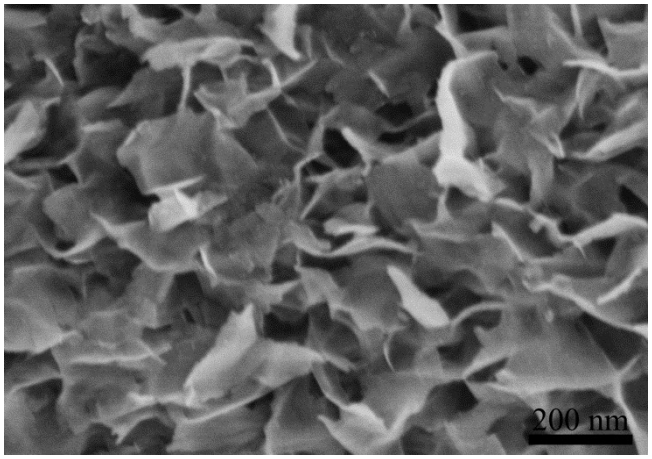

Fig. S1 High-magnification FESEM images of Nb_2O_5 nanosheets in the Nb-doped TiO_2@Nb_2O_5 sample.

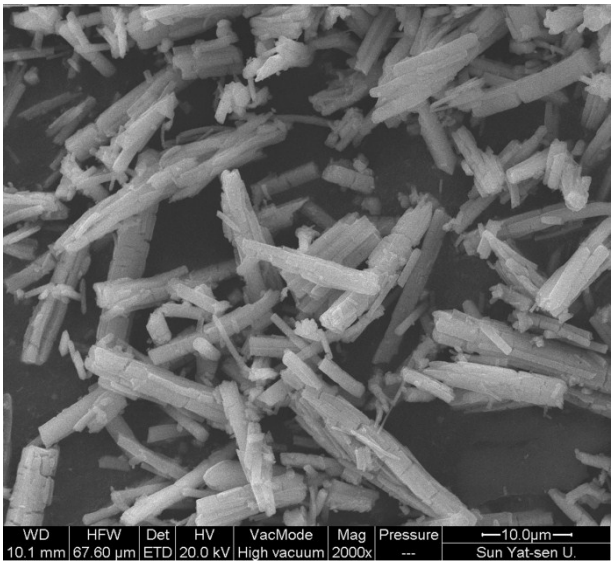

Fig. S2 FESEM of bare TiO_2 rods.

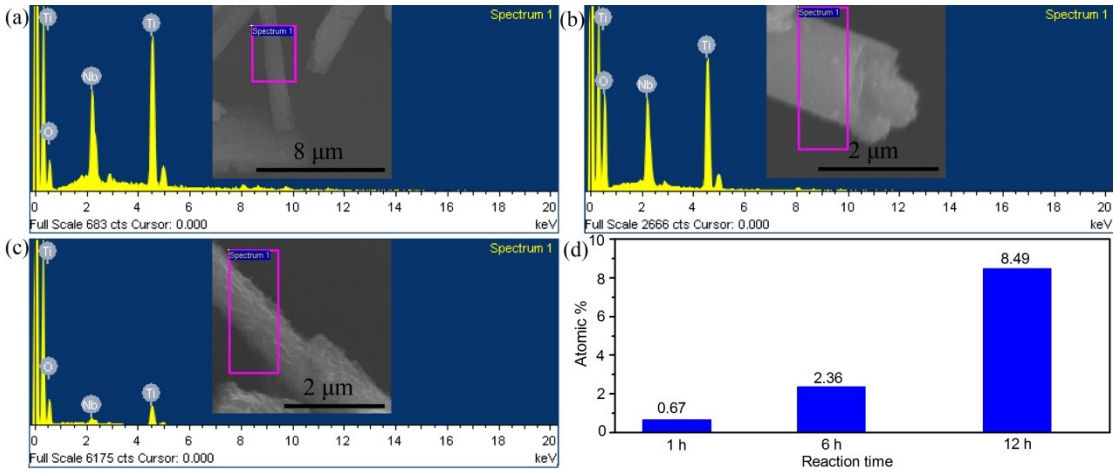

Fig. S3 The time-dependent EDX spectrum of Nb-doped TiO_2@Nb_2O_5 heterostructures that obtained by hydrothermal treatment at 150 °C for (a) 1 h, (b) 6 h, and (c) 12 h, respectively. (d) Histogram of Nb dopant concentration in above samples with different reaction time.

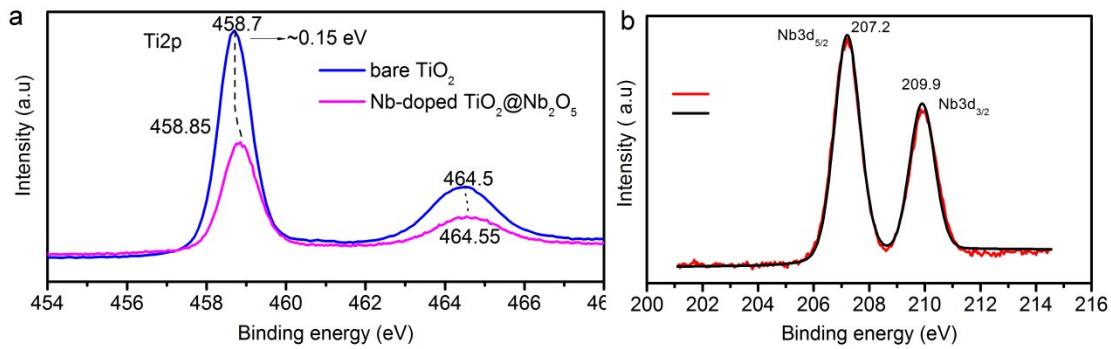

Fig. S4 (a) High-resolution Ti 2p spectra of bare TiO_2 and Nb-doped TiO_2@Nb_2O_5, showing a ca. 0.15 eV shift to higher binding energy, (b) Nb $3d_{5/2}$ XPS spectra of Nb-doped TiO_2@Nb_2O_5 core-shell heterostructures.

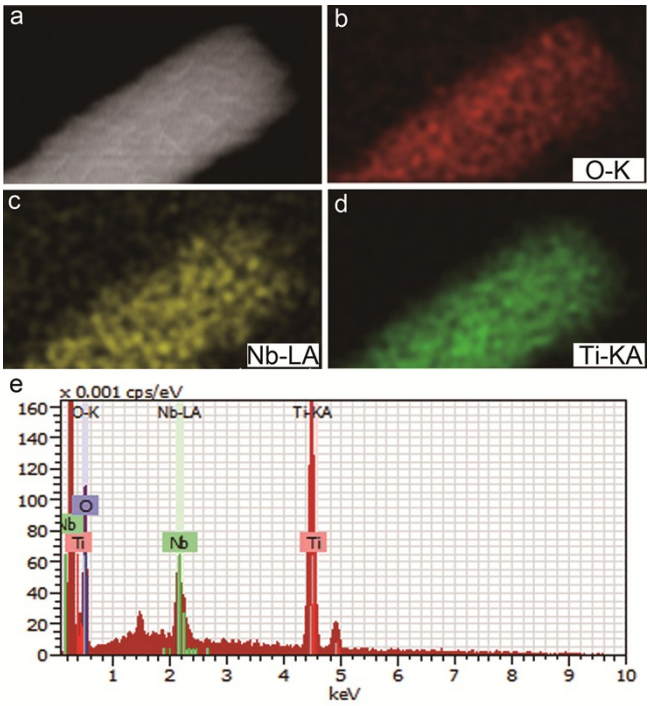

Fig. S5 Images of elemental mapping and the EDS spectrum of Nb-doped TiO_2@Nb_2O_5 core-shell heterostructures by SEM mapping analysis. All the elements (O, Ti and Nb) are homogeneously distributed in the Nb-doped TiO_2@Nb_2O_5 core-shell heterostructures as shown in the upper images and the EDS spectrum shows the presence of O, Ti and Nb elements.

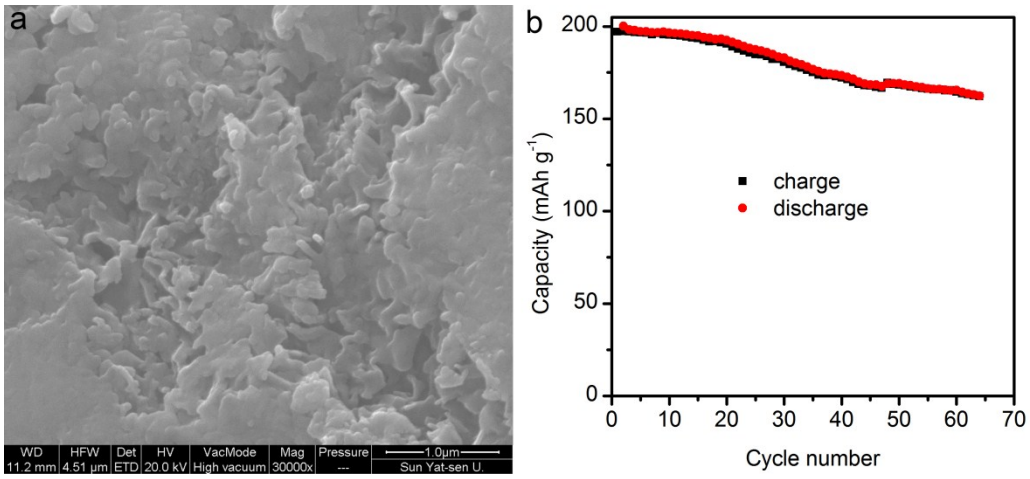

Fig. S6 (a) The Nb_2O_5 nanosheet aggregates produced without the addition of Ti precursor; (b) the cycling performance of bare Nb_2O_5 electrodes.

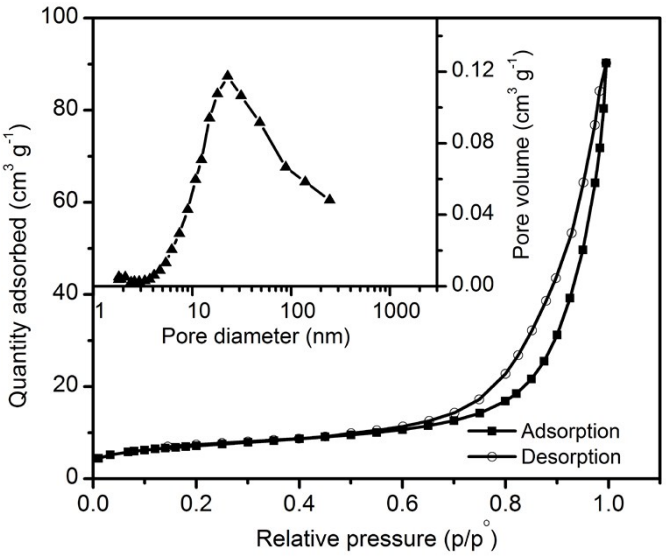

Fig. S7 Nitrogen adsorption-desorption isotherms for Nb-doped TiO_2@Nb_2O_5 core-shell heterostructures. Inset shows the corresponding pore size distribution.

Table S1 Resultant values of equivalent circuit for both the Nb-doped TiO_2@Nb_2O_5 and bare TiO_2 nanorod electrodes after and before cycle.

samples	R_e/Ω (before)	R_b/Ω (before)	R_{sf+ct}/Ω (before)	Re/Ω (after)	Rb/Ω (after)	R_{sf+ct}/Ω (after)
Nb-doped TiO_2@Nb_2O_5	3.1	14.8	8.2	3	4.4	4.1
bare TiO_2	3.7	25.1	21.7	3.5	17.7	14.3