

Supporting Information

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Experimental Detail

Table S1. Deposition conditions of TiO₂ seed layer and ultrathin Pt film using RF magnetron sputtering.

Base pressure	5.0×10 ⁻⁶ torr
Working pressure	5.6×10 ⁻³ torr
Environment gas	Ar
Temperature	Room temperature
Substrate rotation	20 rpm
Target-Substrate distance	15 cm
Target size	2 inch
Deposition time	TiO ₂ seed : 2.5 min Pt : 2 min
RF-power	TiO ₂ seed : 200 W Pt : 30 W

Table S2. Spin-coating conditions for sol-gel TiO₂ seed layer.

Speed	3000 rpm
Time	2 min
Acceleration	300 rpm/s
Dry	300 °C for 5 min in air
Repeat	2 time
Annealing	450 °C for 120 min

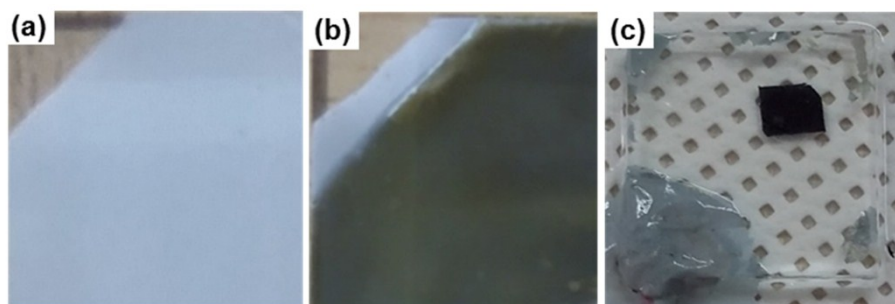


Figure S1. Photographs of (a) TiO_2 NRs, (b) rTiO_2 NRs on the RF-sputtered TiO_2 seed layer and (c) exfoliated rTiO_2 NRs on the sol-gel TiO_2 seed layer.

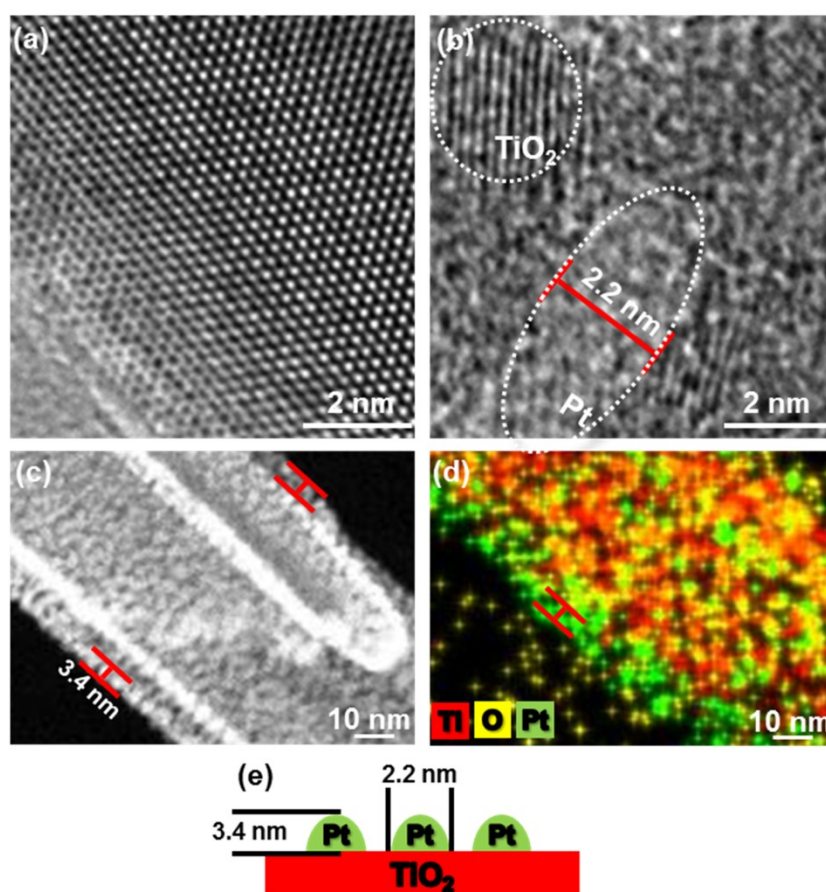


Figure S2. HR-TEM images of (a) rTiO_2 NRs and (b) Pt decorated rTiO_2 NRs, indicates RF-sputtered Pt was amorphous. (e) dark field HR-TEM image and (d) HR-TEM EELS element mapping image of Pt decorated rTiO_2 NRs. (e) schematic description of distribution of RF-sputtered Pt.

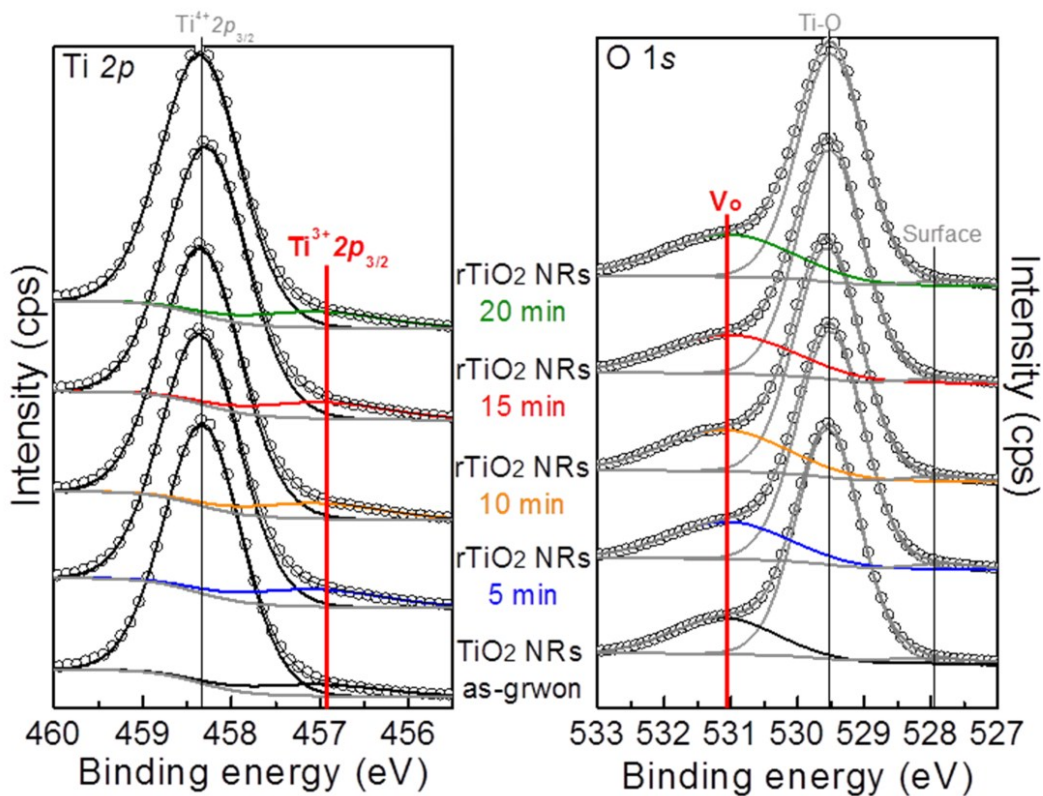


Figure S3. Ti 2p and O 1s XPS spectra of TiO₂ NRs according to electrochemical reduction time.

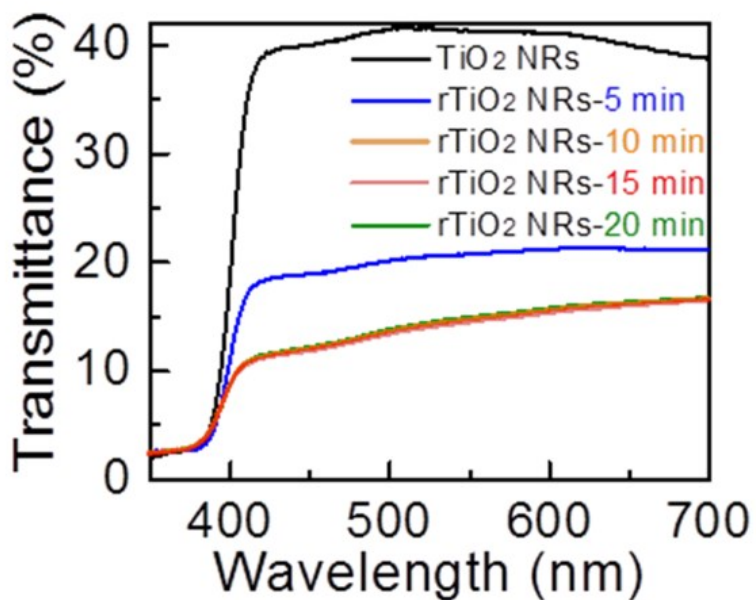


Figure S4. Total diffuse transmittance of TiO₂ NRs and rTiO₂ NRs reduced in different times.

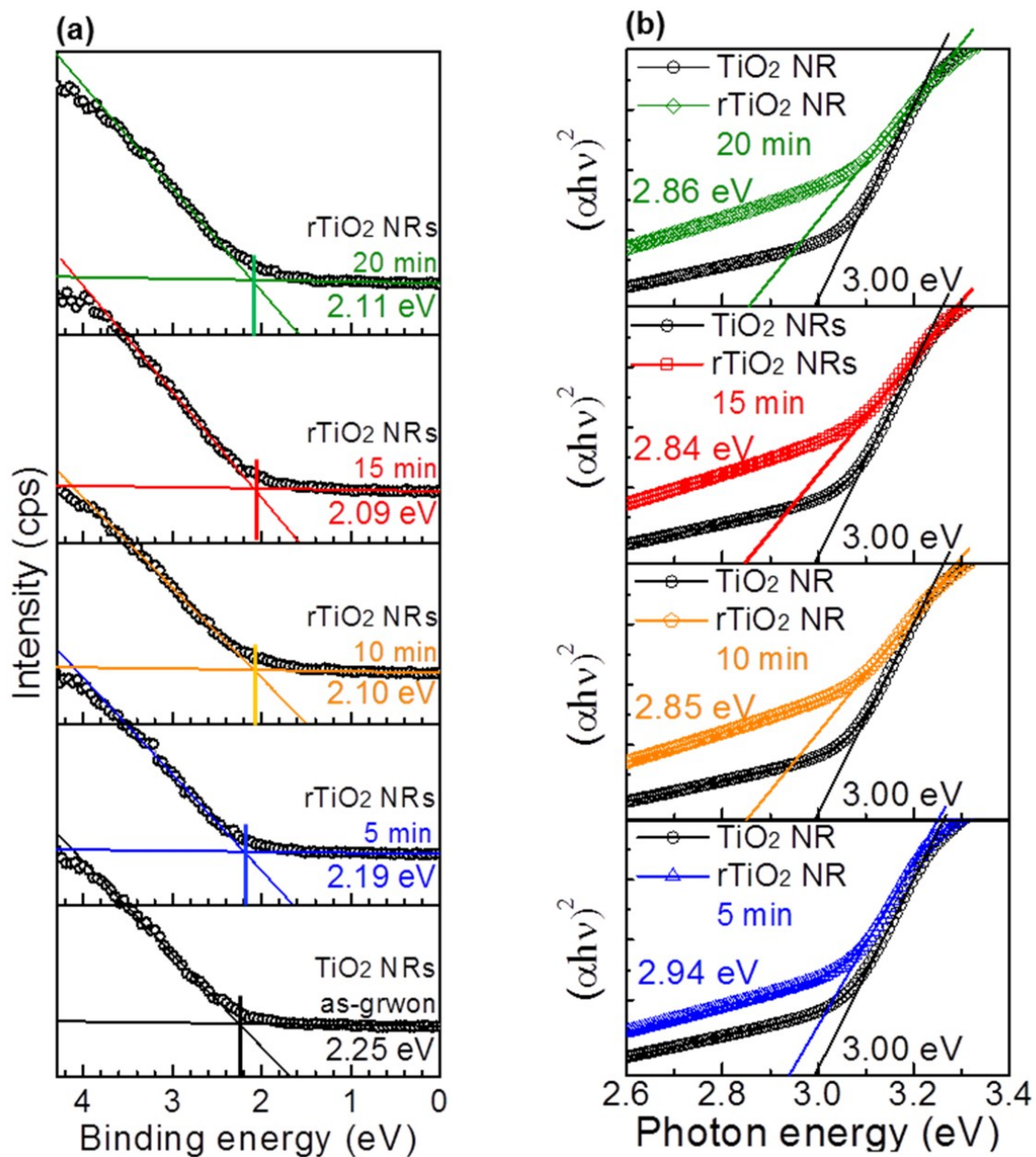


Figure S5. (a) VB positions obtained from VB XPS spectra and (b) plots of Kubelka-Munk function according to the photon energy transformed from total diffuse transmittance.

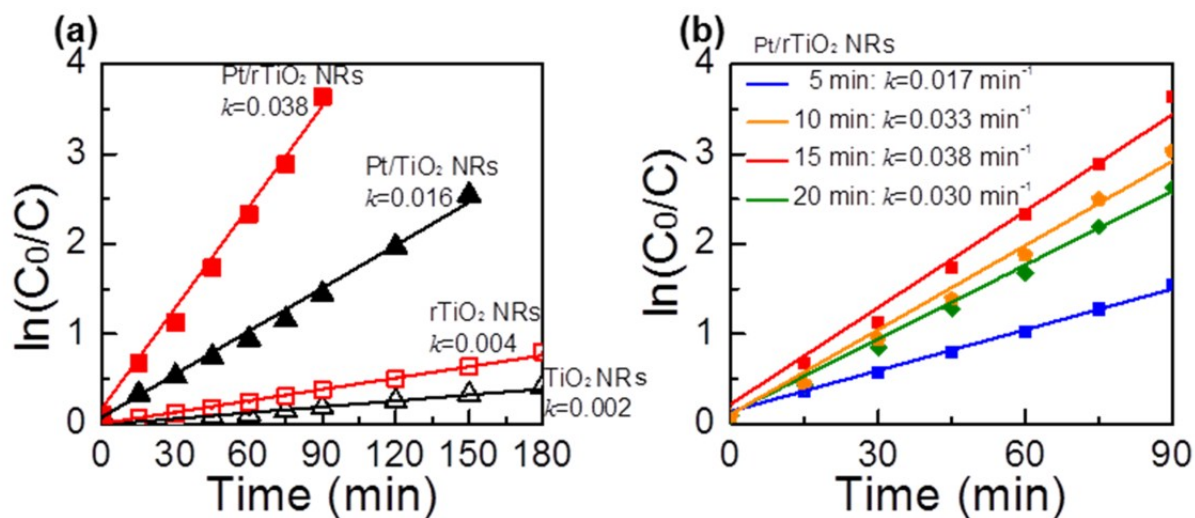


Figure S6. (a) Pseudo-first-order kinetics of TiO₂ NRs, rTiO₂ NRs, Pt/TiO₂ NRs and Pt/rTiO₂ NRs for M.B. photo-degradations. (b) Pseudo-first-order kinetics of Pt/rTiO₂ NRs according to reduction time.