Supplementary Information

New architecture of petal-shape Nb_2O_5 nanosheet film on FTO glass for high photocatalytic activity and application

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Preparation of porous Nb_2O_5 film and P25 film samples

As a comparison, the porous Nb_2O_5 film and P25 film were obtained by using a conventional doctor-blade method, which is described elsewhere. For the modified doctor-blade method, Nb_2O_5 paste was prepared as following: Commercial Nb_2O_5 powder (>99.99%, 1 g) was blended with a mixture of ethyl cellulose ethoce (>99%, 0.08 g), alpha-terpineol (>99.0%, 0.8 g) and moderate alcohol absolute under stirring condition. Similarity, P25 paste was prepared as following: Commercial P25 powder (1 g) was with a mixture of ethyl cellulose ethoce (>99%, 1.5 g), alpha-terpineol (>99.0%, 6 g), and acetic acid (>98.0%, 8 g) under stirring condition. After that, the resulting Nb_2O_5 and P25 pastes were coated on FTO glass to make a thin film using a doctor-blade technique, where the film thickness was fixed about 50 um by using an adhesive tape with 50 um thickness. Then, the as-obtained Nb_2O_5 and P25 films were dried in air for 30 min. Following that, the films were annealed at 450 ^oC for 1 h with a heating rate of 2 ^oC/min in order to remove organic substances. Thus, the porous Nb_2O_5 film and P25 film samples were obtained.

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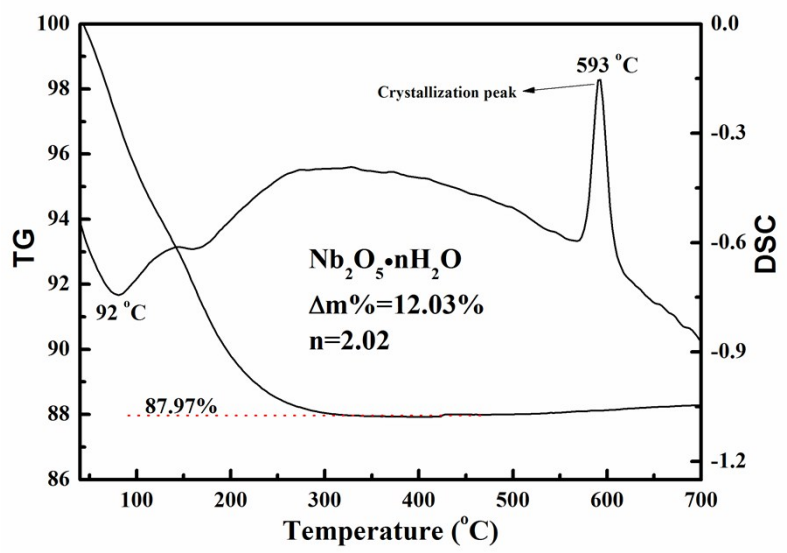


Figure S1 Thermal analysis curves of Nb_2O_5•nH_2O powder

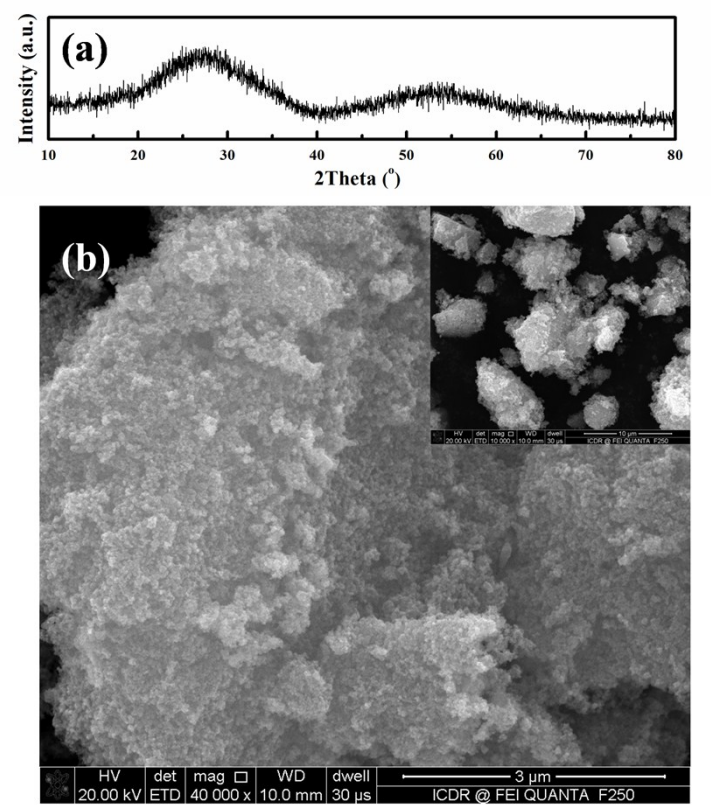


Figure S2 XRD pattern and SEM image of the $Nb_2O_5 \bullet nH_2O$ powder

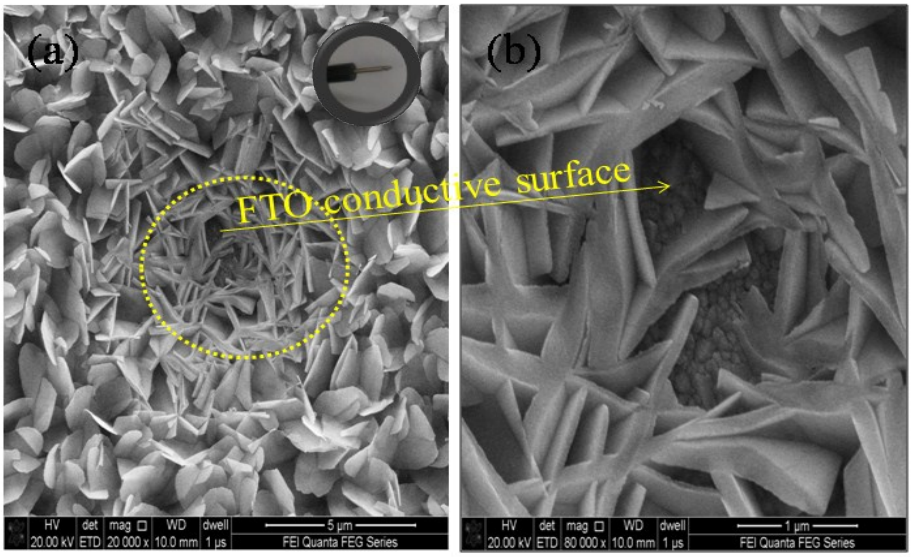


Figure S3 Top-view SEM images of a well shaped defect from the NO-0 sample.

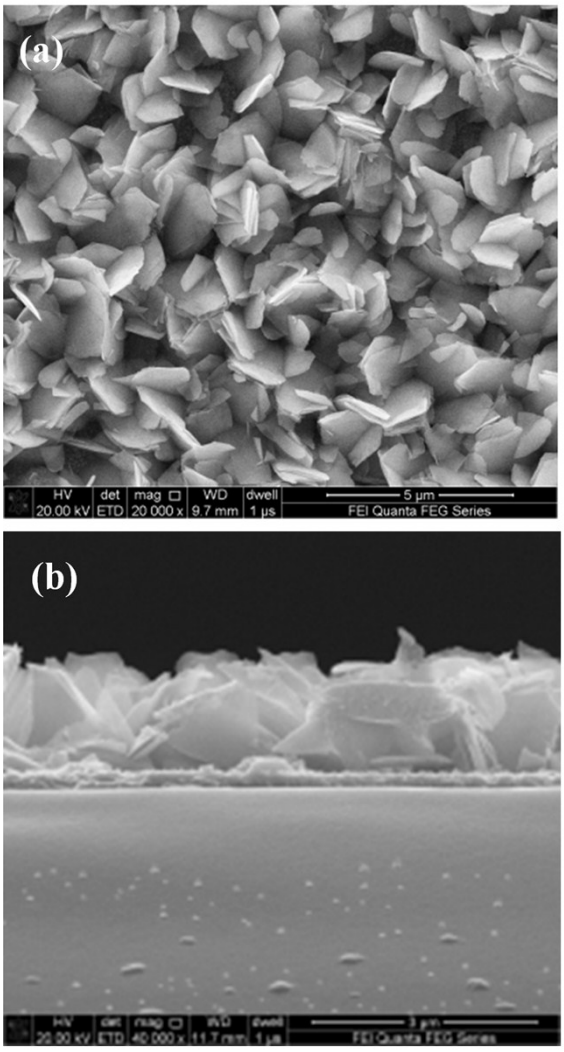
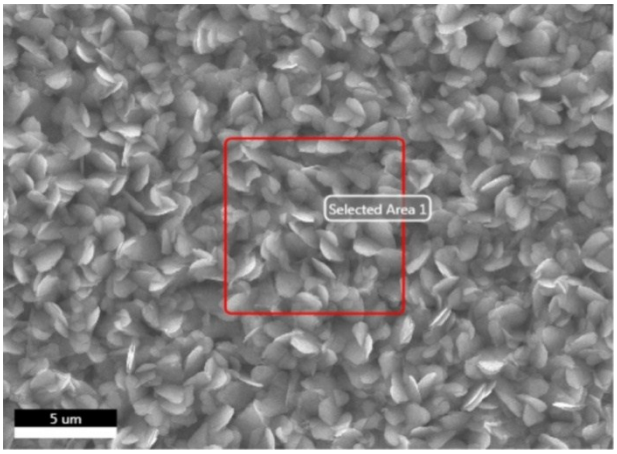
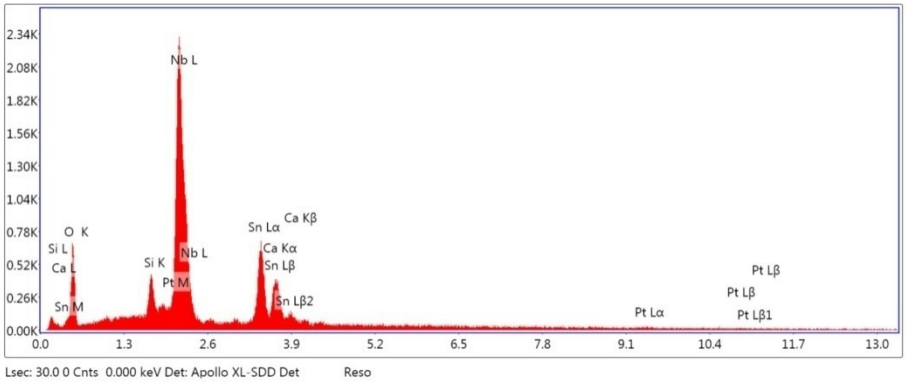


Figure S4 (a) Top-view SEM image and (b) cross-sectional view SEM image of the NO-1 sample.





Element	Weight·%	Atomic·%	Net·Int.	Error·%
O·K	27.41	68.22	140.87	11.47
Si·K	2.78	3.94	91.53	9.27
Nb·L	41.96	17.98	689.41	2.96
Sn·L	23.55	7.9	234.41	6.03
Ca·K	1.36	1.35	27.59	20.04
Pt·L	2.94	0.6	5.5	58.47

Figure S5 Top-view image of the NO-1 sample, EDS spectrum of the selected area and the detailed result of the elemental analysis.

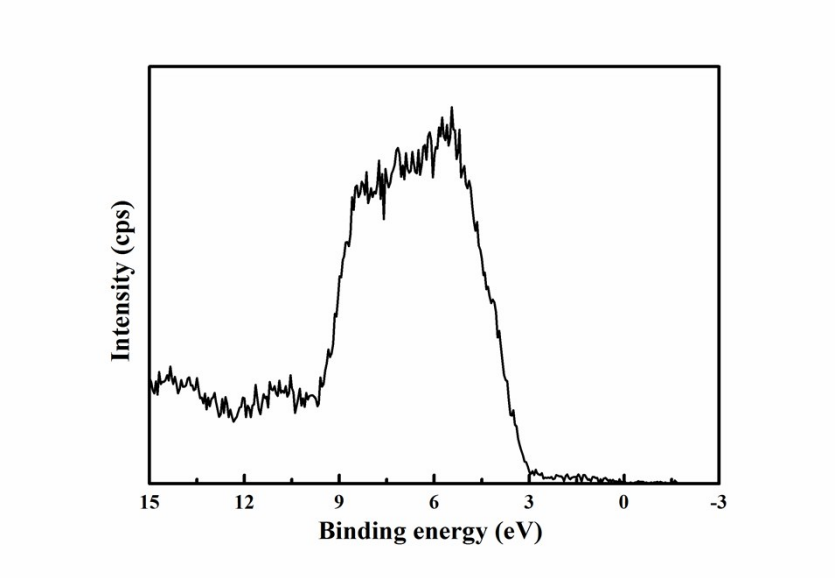


Figure S6 Valence band spectrum of the NO-1 sample

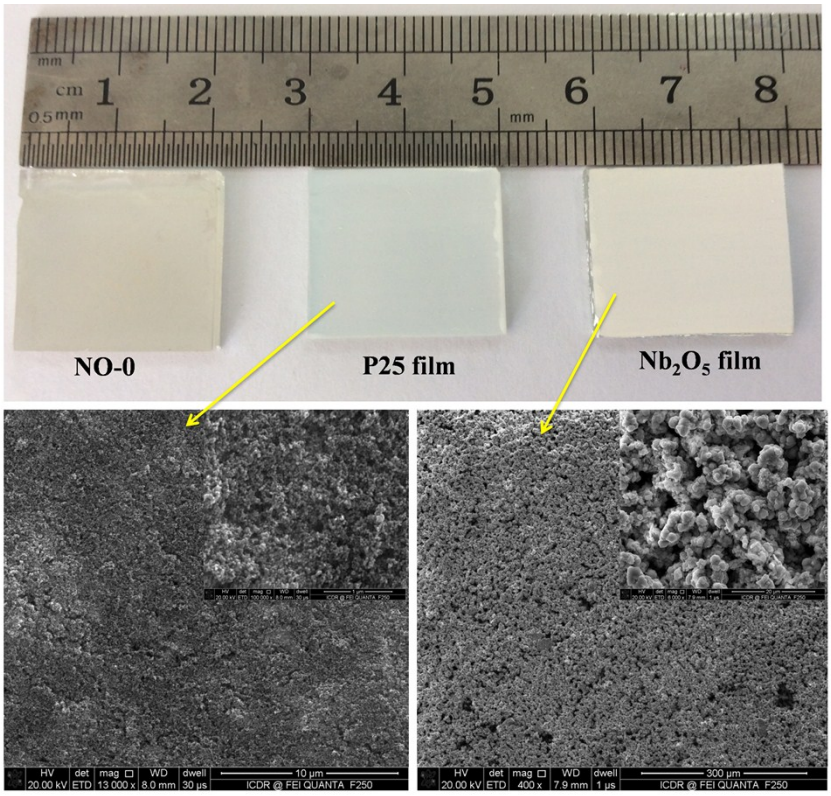


Figure S7 Optical and SEM images of the NO-0, porous P25 and Nb_2O_5 film samples.