

Supplementary information

Haruki Nagakawa,^a Tsuyoshi Ochiai,^{b, c} He Ma,^d Changhua Wang,^d Xintong Zhang,^d Yang Shen,^e Mai Takashima,^{e, f} Bunsho Ohtani,^{e, f} and Morio Nagata^{*a}

- a. Department of Industrial Chemistry, Graduate School of Engineering, Tokyo University of Science, 12-1 Ichigayafunagawara-cho, Shinjuku-ku, Tokyo 162-0826, Japan.
E-mail: nagata@ci.tus.ac.jp
- b. Materials Analysis Group, Research and Development Department, Local Independent Administrative Agency Kanagawa Institute of industrial Science and TEchnology (KISTEC), Kanagawa 213-0012, Japan.
- c. Photocatalysis International Research Center, Tokyo University of Science, Chiba 278-8510 Japan.
E-mail: pg-ochiai@newkast.or.jp
- d. Center for Advanced Optoelectronic Functional Materials Research, and Key Laboratory of UV-Emitting Materials and Technology of Ministry of Education, Northeast Normal University, Changchun, 130024 China.
E-mail: xtzhang@nenu.edu.cn
- e. Graduate School of Environmental Science, Hokkaido University, Sapporo 060-0810, Japan.
- f. Institute for Catalysis, Hokkaido University, Sapporo 001-0021, Japan.
E-mail: ohtani@cat.hokudai.ac.jp; Fax: +81-11-706-9133

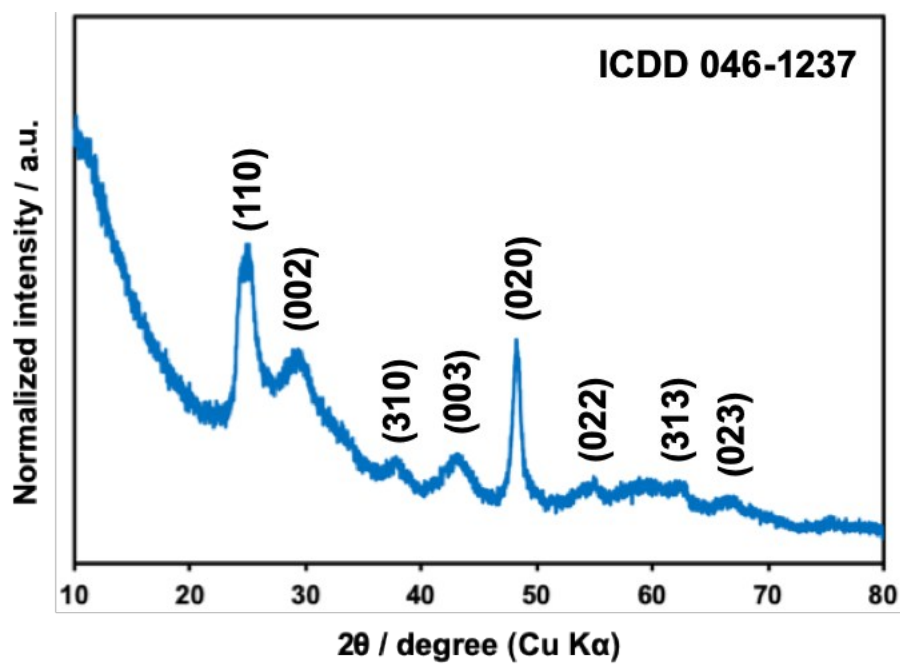


Fig. S1. XRD patterns of the synthesized t-NT350.

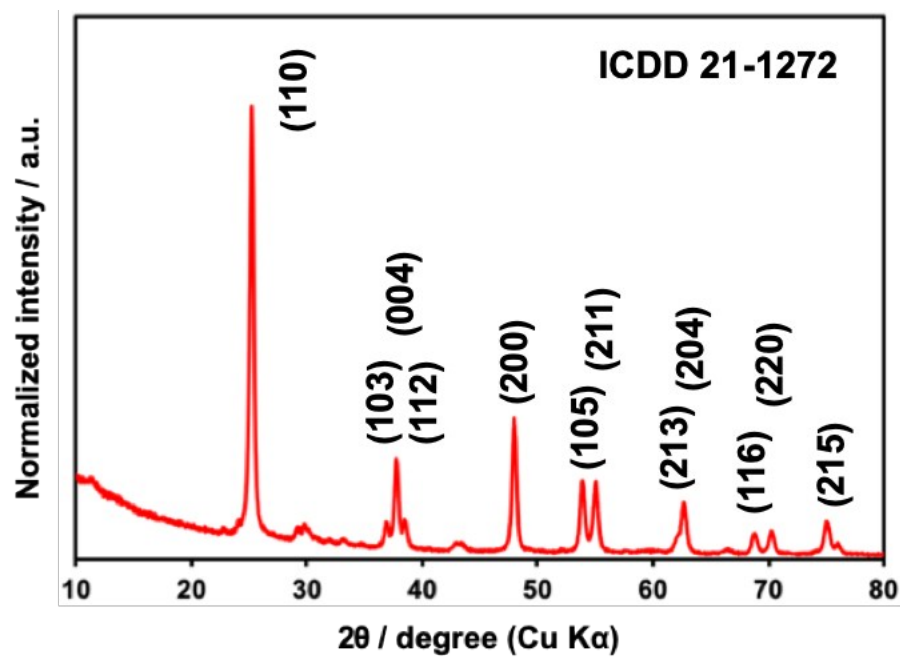


Fig. S2. XRD patterns of the synthesized t-NT700.

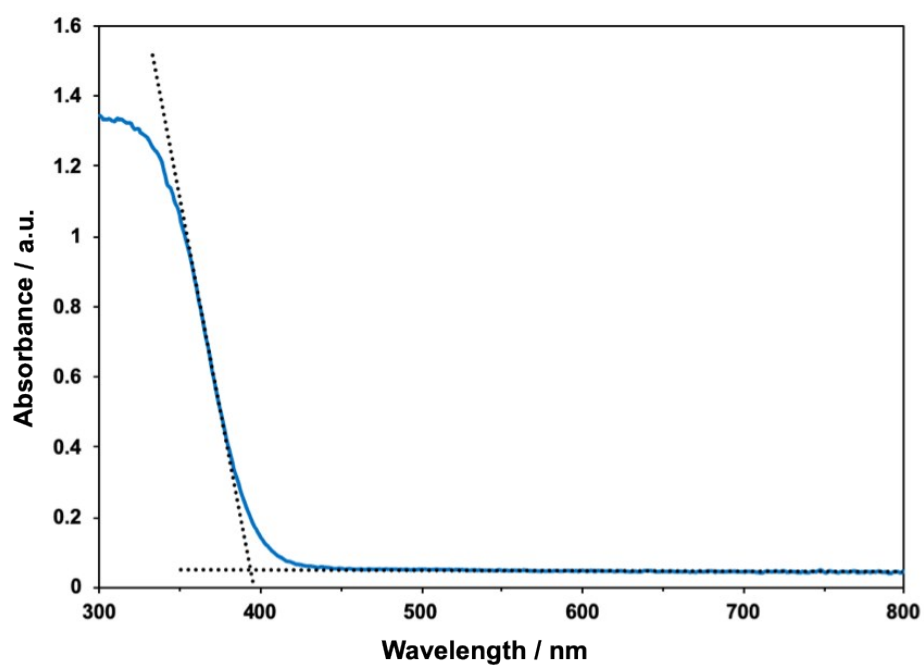


Fig. S3. UV-vis DRS spectra of the prepared t-NT350.

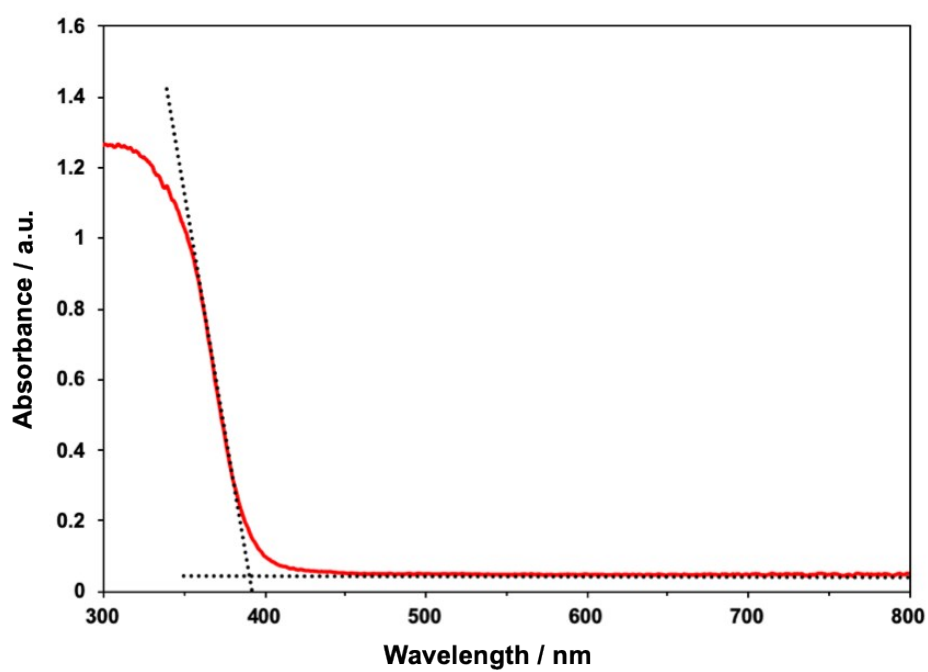


Fig. S4. UV-vis DRS spectra of the prepared t-NT700.

Table. S1 Relationships between shifting energy for the VBT of NT350 and $\zeta(a)$ of the 1 : 3 and 3 : 1 mixture and simulation pairs.

shifting energy / eV	NT350 + NT700 mixture	
	1 : 3	3 : 1
0	0.801	0.855
0.01	0.818	0.888
0.02	0.835	0.916
0.03	0.851	0.921
0.04	0.866	0.909
0.05	0.880	0.885
0.06	0.892	0.858
0.07	0.902	0.827
0.08	0.907	0.794
0.09	0.906	0.760
0.1	0.904	0.725
0.11	0.901	0.691
0.12	0.896	0.659
0.13	0.890	0.627
0.14	0.883	0.597
0.15	0.874	0.567