

Supporting Information: A Selective Synthesis of TaON Nanoparticles and their Comparative Study of Photoelectrochemical Properties

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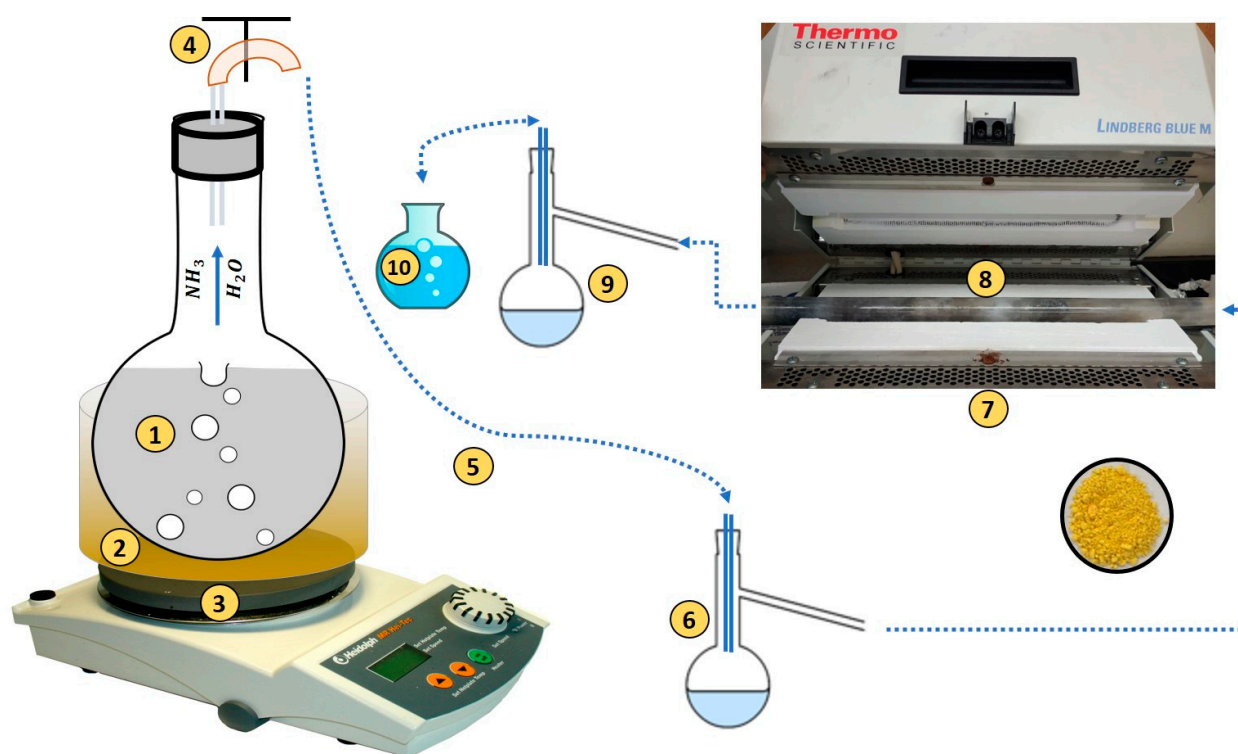


Figure S1. The schematic of the simplified TaON synthesis protocol. Labels: (1) ammonium hydroxide mixed in tap-water ($\text{NH}_4\text{OH}:\text{H}_2\text{O} = 200\text{ml}:150\text{ml}$), (2) ethylene glycol used as the heating bath, (3) heating plate ($350\text{ }^\circ\text{C}$), (4) Inlet control valve (opened after the tube furnace reaches $700\text{ }^\circ\text{C}$), (5) Inlet carrier pipe (0.5 inch ID), (6) Excess moisture trap, (7) Tube Furnace equipped with automatic temperature control (8) Oxide sample ($\sim 0.5\text{g Ta}_2\text{O}_5$), (9) Backflow preventer (from exhaust (10) during occasional pressure destabilization).

Table S1. The table shows the optical bands emitted from the Mercury (Hg) lamp when they are used as a light sources for the photocatalysis experiments.

Hg, $\lambda(\text{nm})$	%, E
220–280	15.4
200–320	16.3
320–400	15.9
400–800	43.1
800–1400	9.3

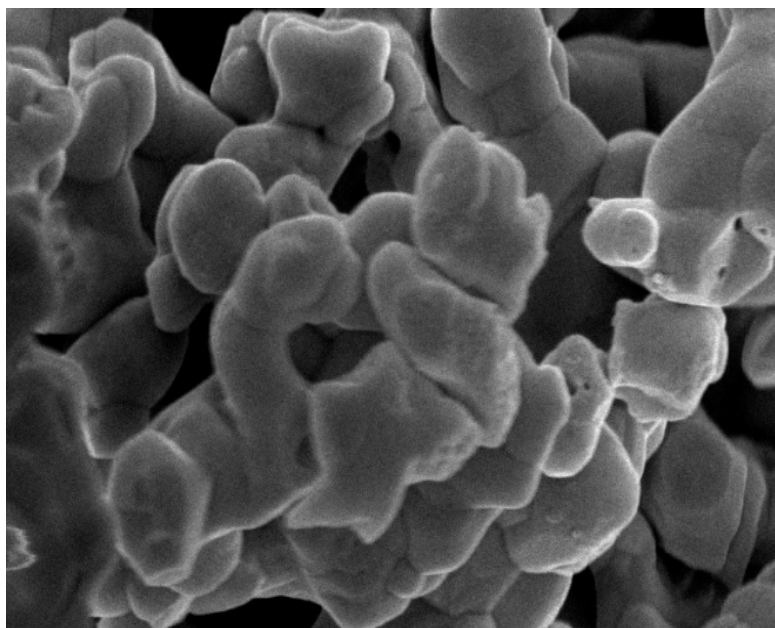


Figure S2. Scanning electron microscope image of commercial Ta_2O_5 sample.

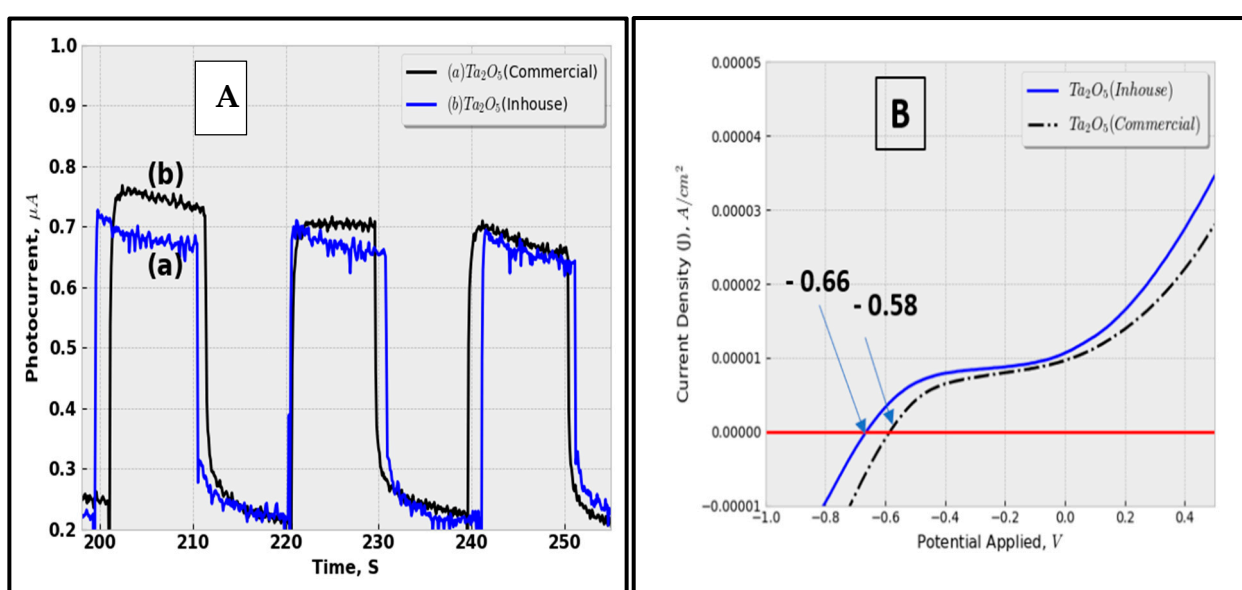


Figure S3. (A) Chrono-amperometry (i/t) responses and (B) Linear sweep voltammetry of Commercial and In-house Ta_2O_5 (Pt counter electrode, leak-free Ag/AgCl (in 0.2M NaOH) as the reference electrode and sample coated ITO slide as working electrode).

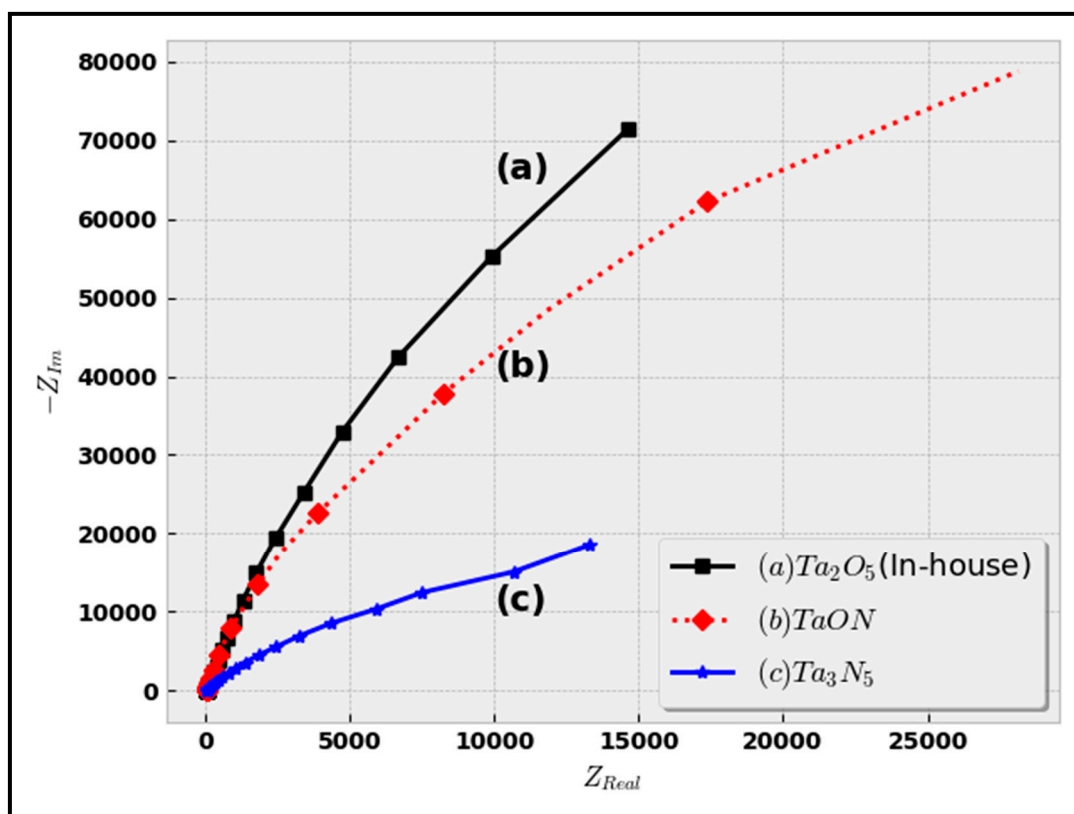


Figure S4. The figure shows the results of the electrochemical impedance analysis (EIS, Nyquist Plots) of (a) as-synthesized Ta_2O_5 , (b) TaON, and (c) Ta_3N_5 . (Pt counter electrode, leak-free Ag/AgCl (in 0.2M NaOH) as the reference electrode and sample coated FTO slide as working electrode).