Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Supporting Information

Two-step photocatalytic water splitting into H_2 and O_2 using layered metal oxide $KCa_2Nb_3O_{10}$ and its derivatives as O_2-evolving photocatalysts with IO_3^-/I^- or Fe^{3+}/Fe^{2+} redox mediator

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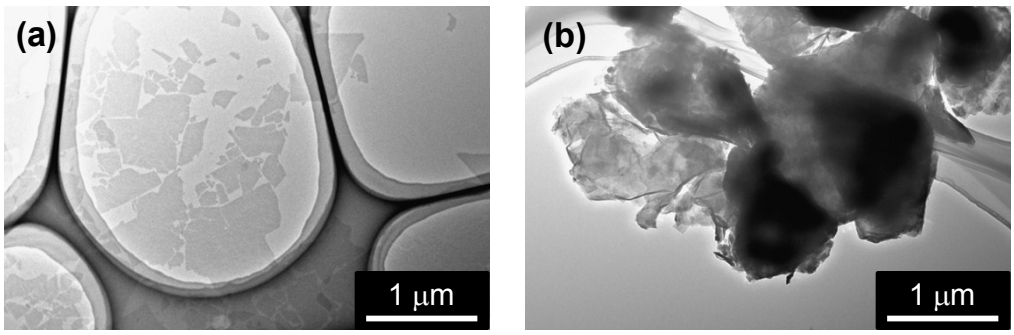

Fig. S1 TEM images of (a) exfoliated nanosheets and (b) ex-$Ca_2Nb_3O_{10}/K^+$.

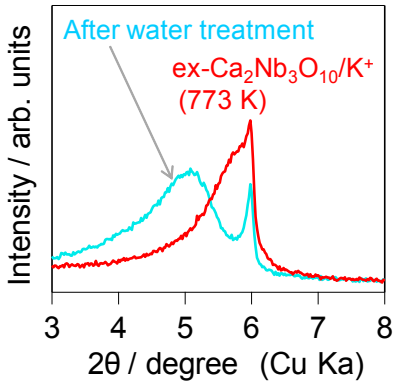

Fig. S2 XRD patterns of ex-$Ca_2Nb_3O_{10}/K^+$(500 °C) and after water treatment.

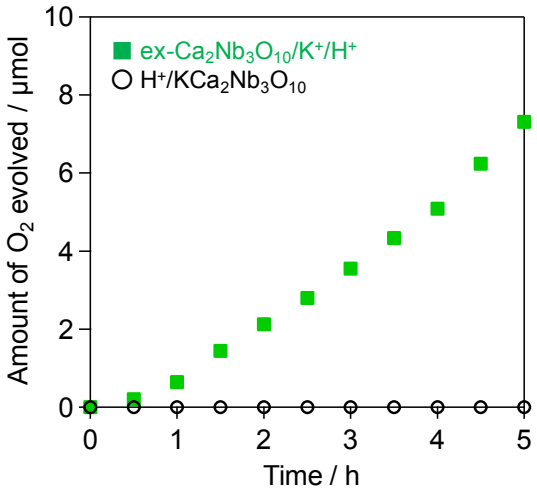

Fig. S3 Time courses of O_2 evolution over 100 mg of $H^+/KCa_2Nb_3O_{10}$ and ex-$Ca_2Nb_3O_{10}/K^+/H^+$, in 5 mM $NaIO_3$ aqueous solution under UV light irradiation ($\lambda > 300$ nm, Xe lamp).

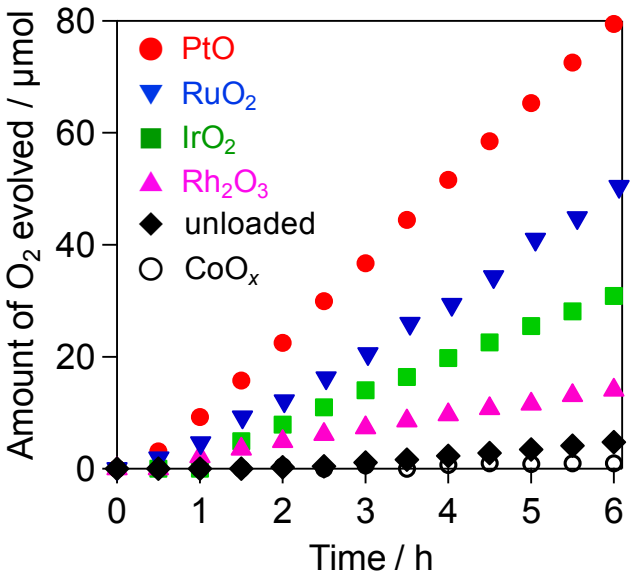

Fig. S4 Time courses of O_2 evolution over ex-$Ca_2Nb_3O_{10}/K^+$ samples loaded with 0.3 wt% of various metal oxides (PtO, RuO_2, IrO_2, Rh_2O_3, CoO_x) in 5 mM $NaIO_3$ aqueous solution under UV light irradiation ($\lambda > 300$ nm, Xe lamp).

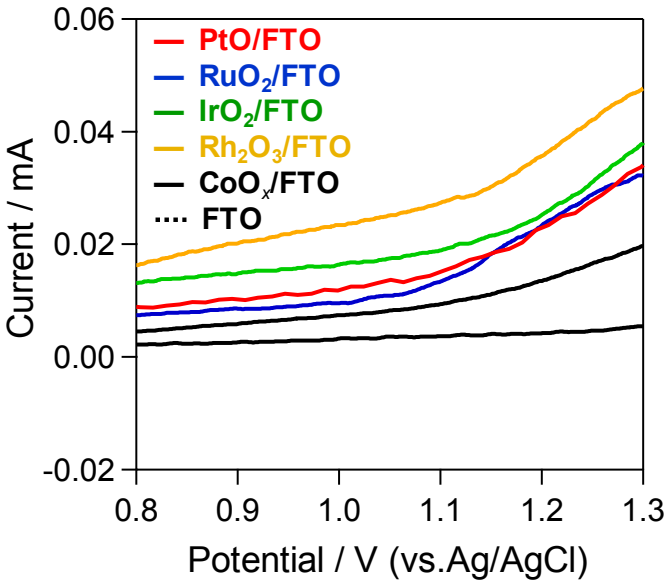

Fig. S5 CV profiles of FTO substrates loaded with various metal oxides in the presence of H_2O (360 mL).

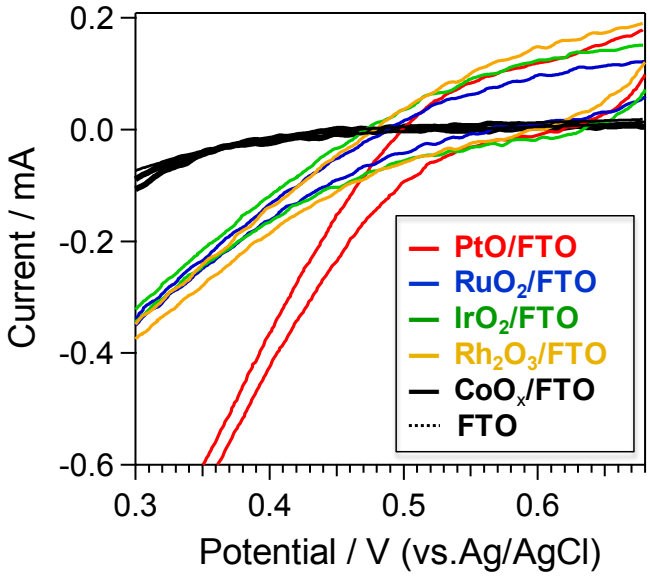

Fig. S6 CV profiles of FTO substrates loaded with various metal oxides in the presence of Fe^{3+}(5 mM, pH 2.3).

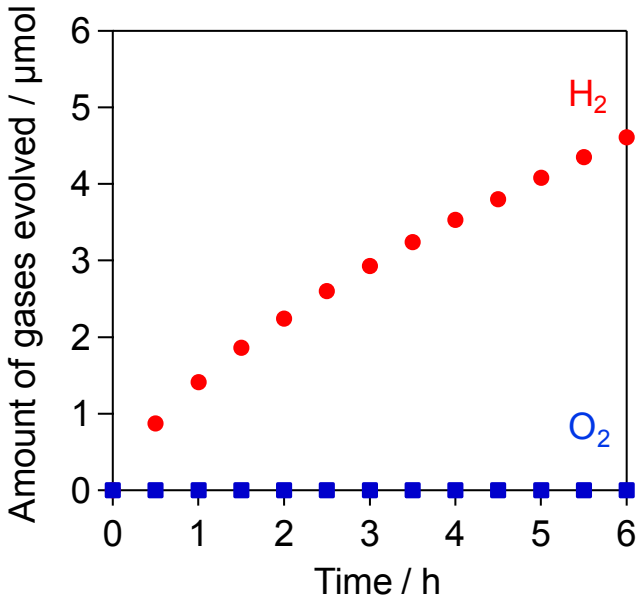

Fig. S7 Time course of gas evolution over $Pt/SrTiO_3$:Rh from KI aqueous solution (5 mM, pH=12.0) under UV light irradiation ($\lambda > 300$ nm, Xe lamp).