

Electronic Supplementary Information (ESI)

Photocatalytic overall water splitting on Pt
nanocluster-intercalated, restacked $\text{KCa}_2\text{Nb}_3\text{O}_{10}$
nanosheets: the promotional effect of co-existing ions

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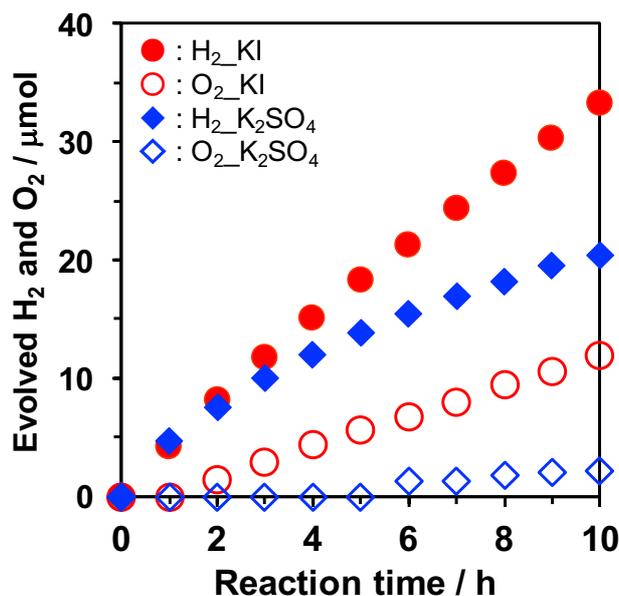


Fig. S1. Time courses of H₂ and O₂ evolution over Pt/KCa₂Nb₃O₁₀ in aqueous solution containing KI (10 mM, red marks) or K₂SO₄ (5 mM, blue marks). Closed marks: H₂ and open marks: O₂. Reaction condition: Catalyst, 50 mg; reaction solution, 100 mL; light source, 300 W Xe lamp ($\lambda \geq 300$ nm).

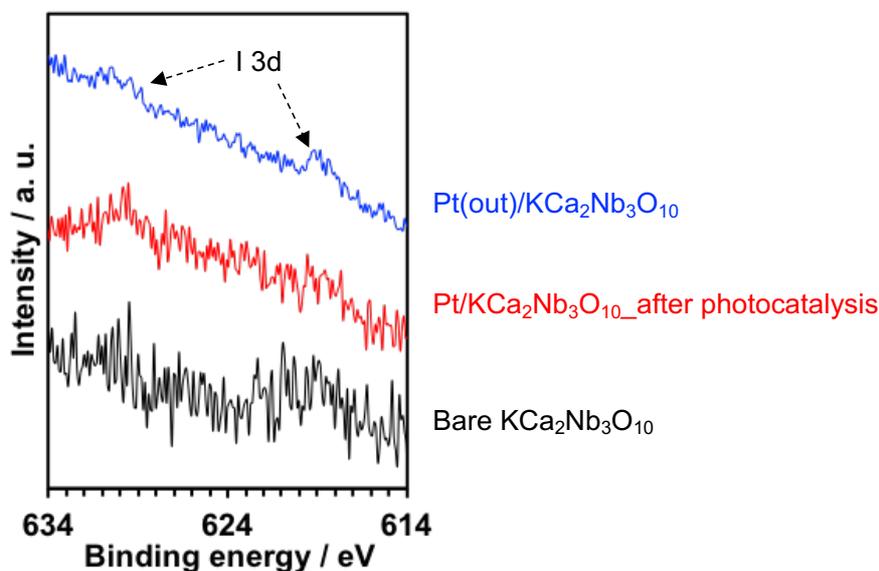


Fig. S2. XPS spectra for I 3d of bare KCa₂Nb₃O₁₀ and Pt/KCa₂Nb₃O₁₀. Pt(out)/KCa₂Nb₃O₁₀ was prepared by an impregnation method. Restacked KCa₂Nb₃O₁₀ and an aqueous H₂PtCl₆ solution (Pt 1.0 wt%) were placed on an evaporation dish, and the solution was dried up on a steam bath. The resulting powder was heated at 473 K for 1 h under a H₂ flow (20 mL min⁻¹), followed by stirring in an aqueous NaI solution (10 mM) overnight.

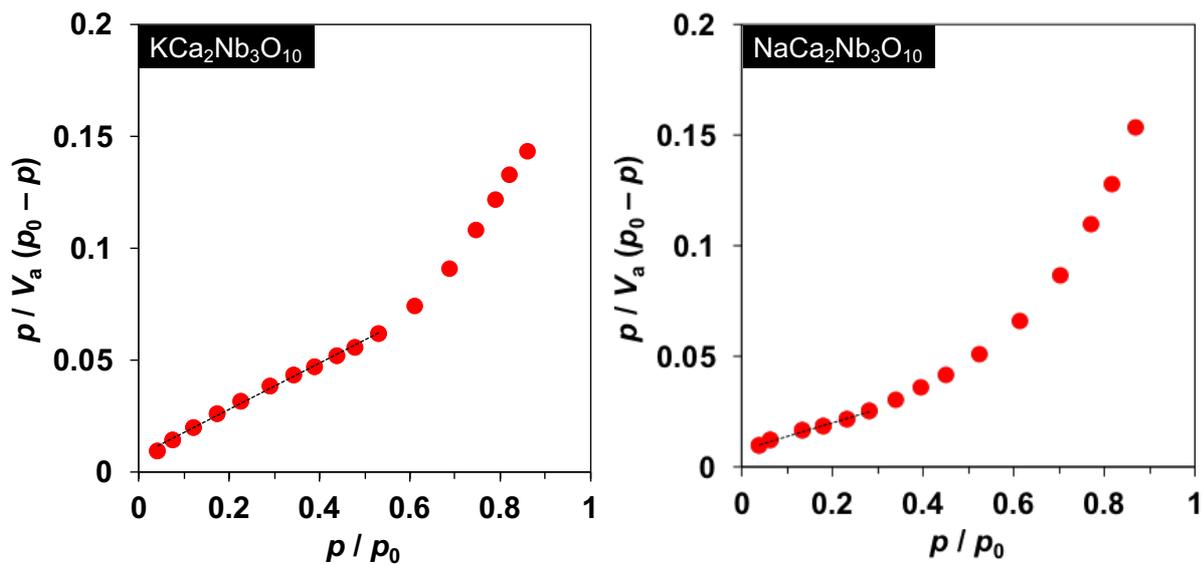


Fig. S3. H₂O adsorption isotherms for $\text{KCa}_2\text{Nb}_3\text{O}_{10}$ and $\text{NaCa}_2\text{Nb}_3\text{O}_{10}$. $\text{NaCa}_2\text{Nb}_3\text{O}_{10}$ was obtained by restacking $\text{TBA}^+/\text{Ca}_2\text{Nb}_3\text{O}_{10}^-$ nanosheet by an aqueous NaOH solution (2 M) instead of an aqueous KOH solution (2 M).