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

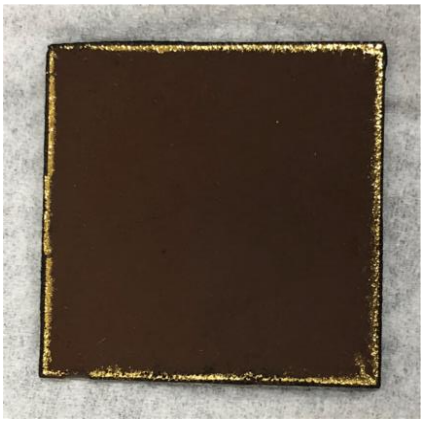

Figure S1. A picture of a Ga-LTCA/Au/$LaTiO_2N$ photocatalyst sheet.

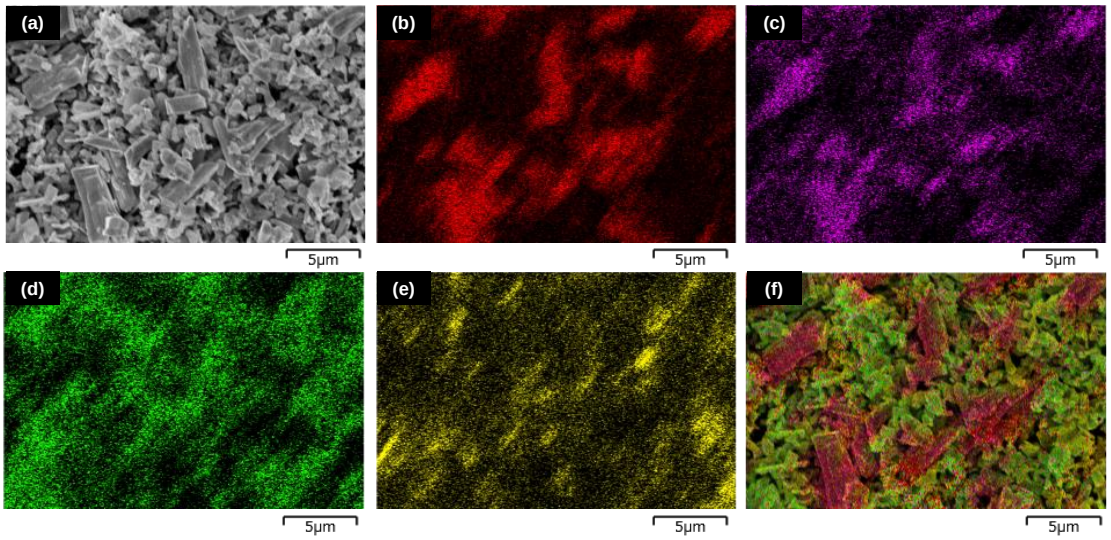

Figure S2. Top-view SEM-EDX mapping images of a Ga-LTCA/Au/$LaTiO_2N$ photocatalyst sheet. (a) an SEM image and (b-f) EDX mapping images for (b) S, (c) Cu, (d) N, (e) Au, and (f) superimposition of b-e.

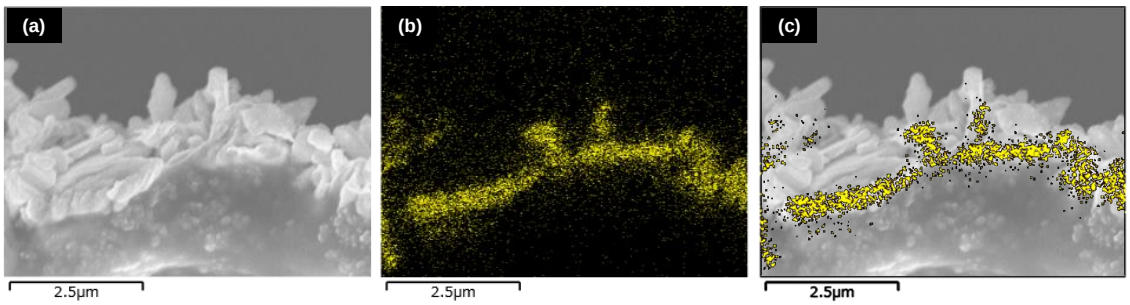

Figure S3. Cross-sectional view SEM-EDX mapping images of a Ga-LTCA/Au/$LaTiO_2N$ photocatalyst sheet. (a) an SEM image, (b) EDX mapping images for Au, and (c) superimposition of a,b after adjustment of the contrast for clarity.

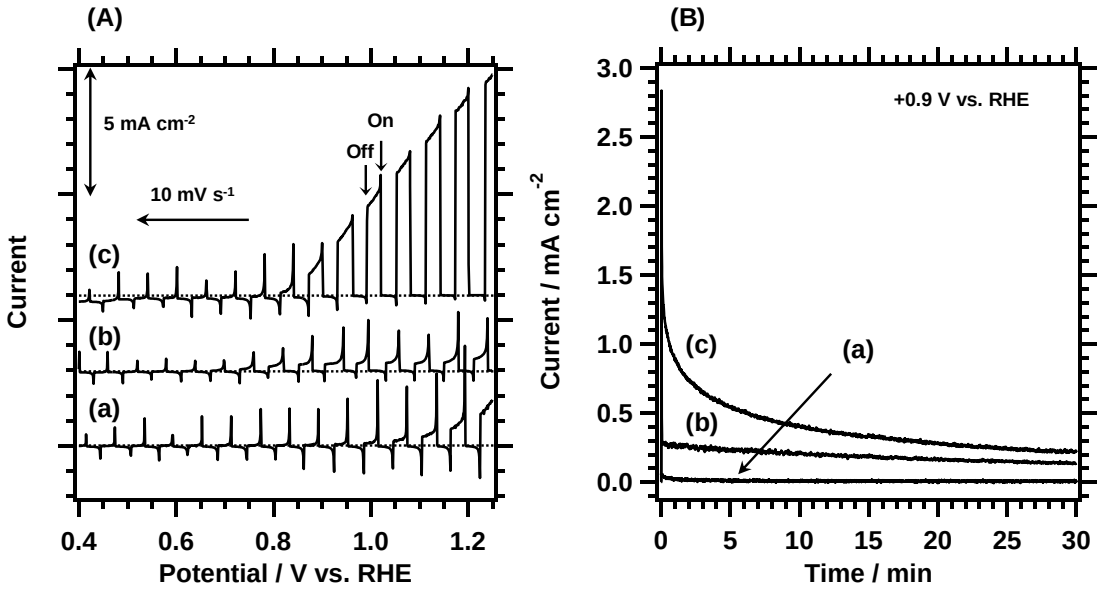

Figure S4. (A) Current-potential and (B) current-time profiles for $LaTiO_2N$/Au photoanodes at pH values of (a) 6, (b) 11 and (c) 13 under chopped and continuous visible light irradiation ($\lambda > 420$ nm) from Xe lamp, respectively. The $LaTiO_2N$ was loaded with CoO_x (2 wt% as Co).

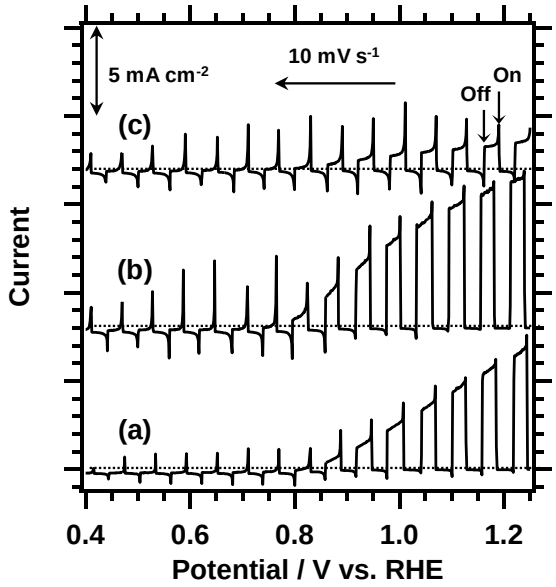

Figure S5. Effect of CoO_x loading on $LaTiO_2N$ on current-potential curves for $LaTiO_2N$/Au photoanodes at pH 13 under chopped visible light irradiation ($\lambda > 420$ nm) from Xe lamp. CoO_x loadings were (a) 2, (b) 5 and (c) 10 wt%.

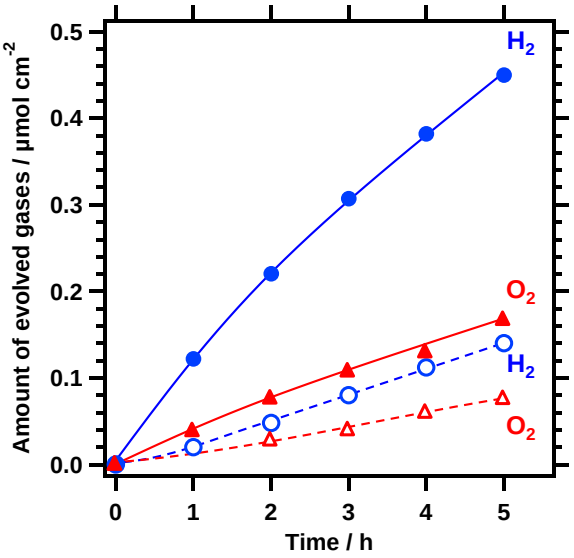

Figure S6. Time courses of gas evolution during water splitting reactions under using a Ga-LTCA/Au/$LaTiO_2N$ photocatalyst sheet (ca. 9 cm^2) and short-circuited Ga-LTCA/Au photocathode (1.4 cm^2) and CoO_x/$LaTiO_2N$/Au photoanode (1.1 cm^2) at pH 11 under visible light irradiation ($\lambda > 420$ nm) from Xe lamp. Closed and open symbols represent the photocatalyst sheet and the short-circuited photoelectrodes, respectively. The $LaTiO_2N$ was loaded with CoO_x (5 wt% as Co). The samples were modified with Rh species.