Electronic Supplementary Information

Modification of gold nanoparticles with a hole-transferring cocatalyst: A new strategy for plasmonic water splitting under irradiation of visible light

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Supplementary Figures

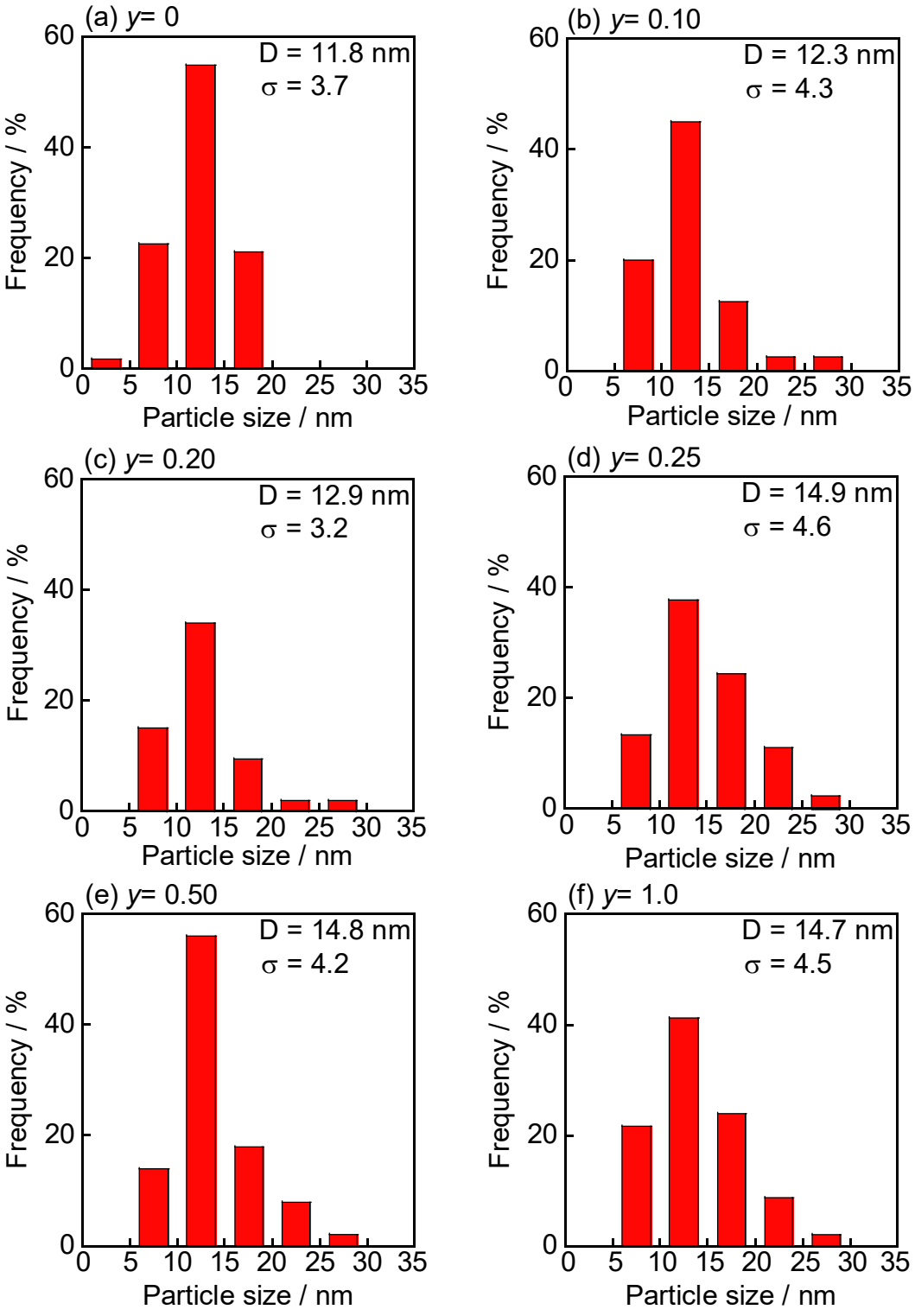

Figure S1 Size distributions of (a) Au NPs of Au/TiO_2 and (b)-(f) $Cr(OH)_3$/Au NPs of $Cr(OH)_3(y)/Au/TiO_2$.

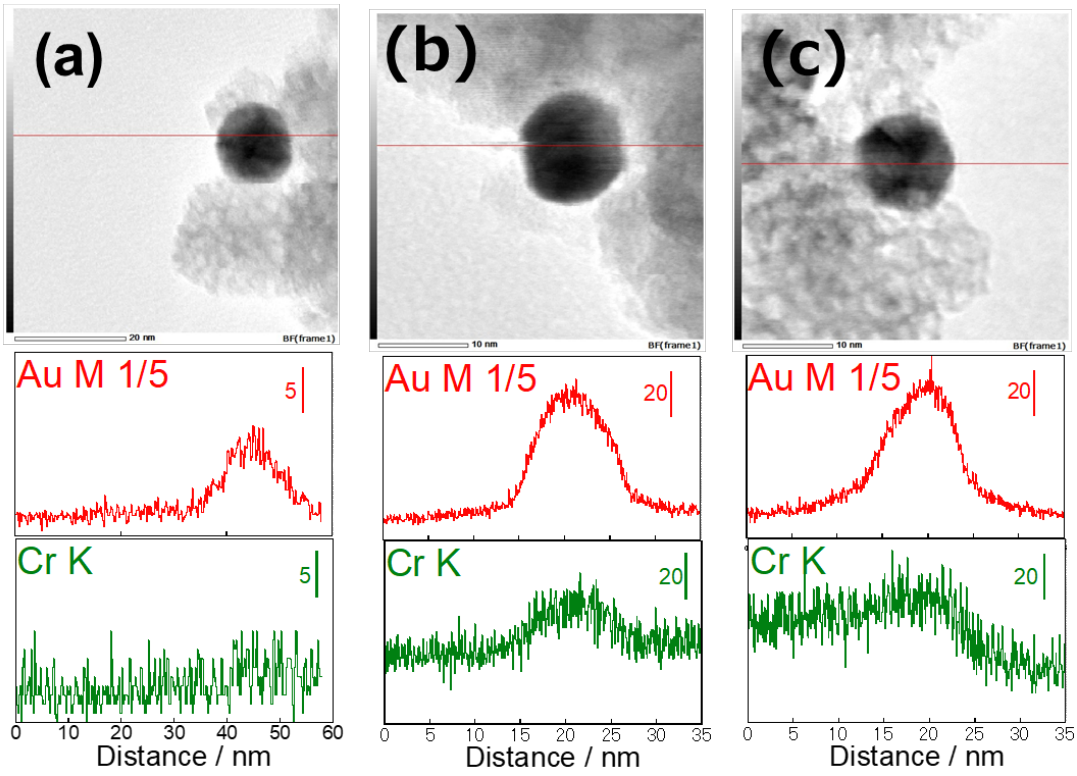

Figure S2 TEM images and EDS spectra of (a) Au/TiO_2, (b) $Cr(OH)_3(0.10)/Au/TiO_2$ and (c) $Cr(OH)_3(1.0)/Au/TiO_2$.

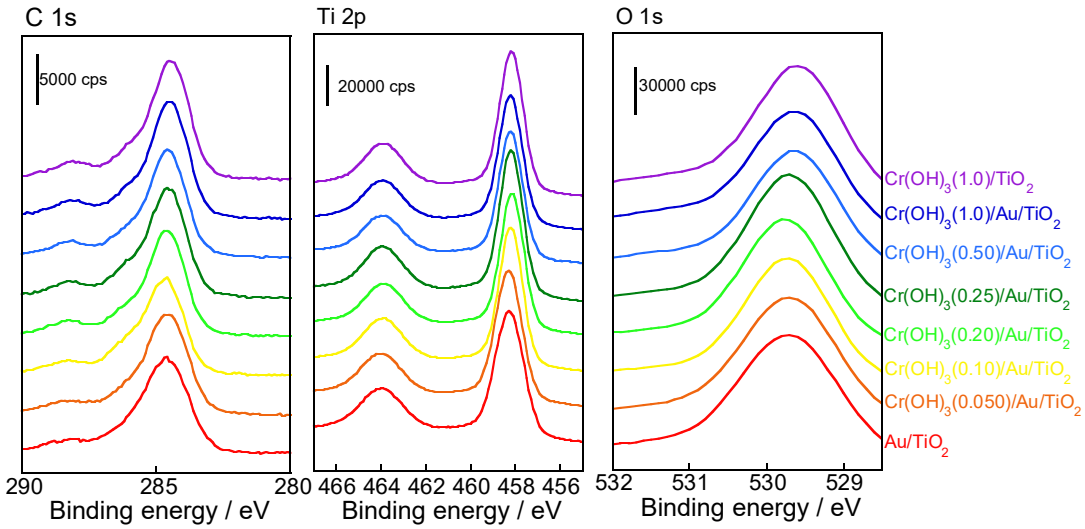

Figure S3 XPS spectra of Au/TiO_2, $Cr(OH)_3/TiO_2$ and $Cr(OH)_3(y)/Au/TiO_2$ around the C 1s, Ti 2p and O 1s components.

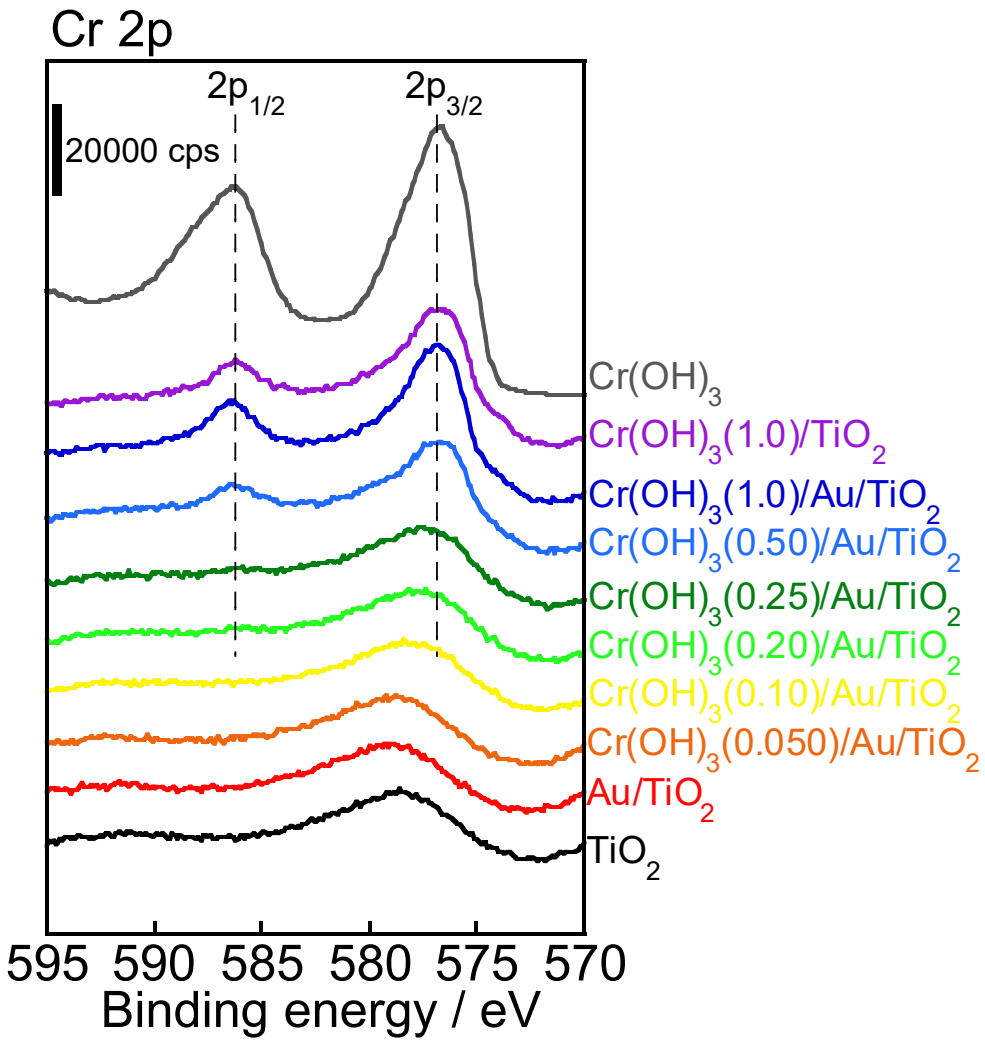

Figure S4 XPS spectra of TiO_2, Au/TiO_2, $Cr(OH)_3/TiO_2$, $Cr(OH)_3(y)/Au/TiO_2$ and $Cr(OH)_3$ around the Cr 2p component.

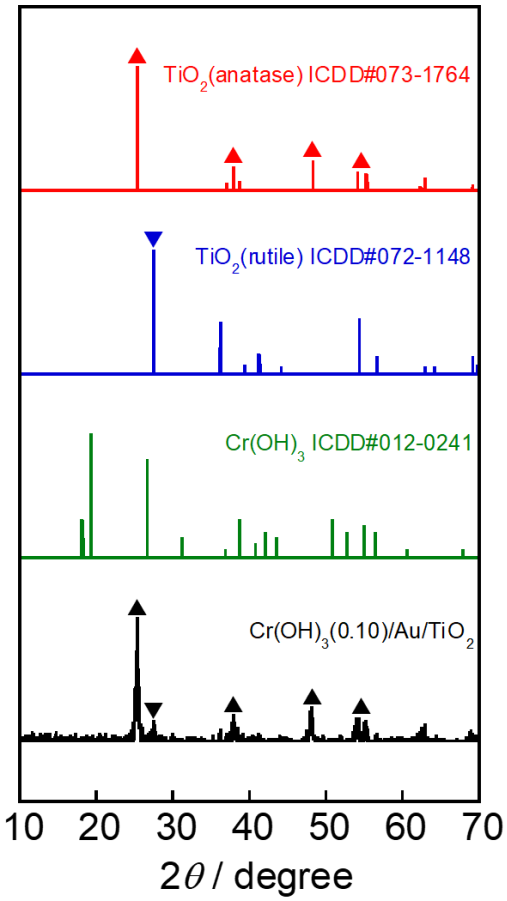

Figure S5 XRD pattern of $Cr(OH)_3(0.10)/Au/TiO_2$.

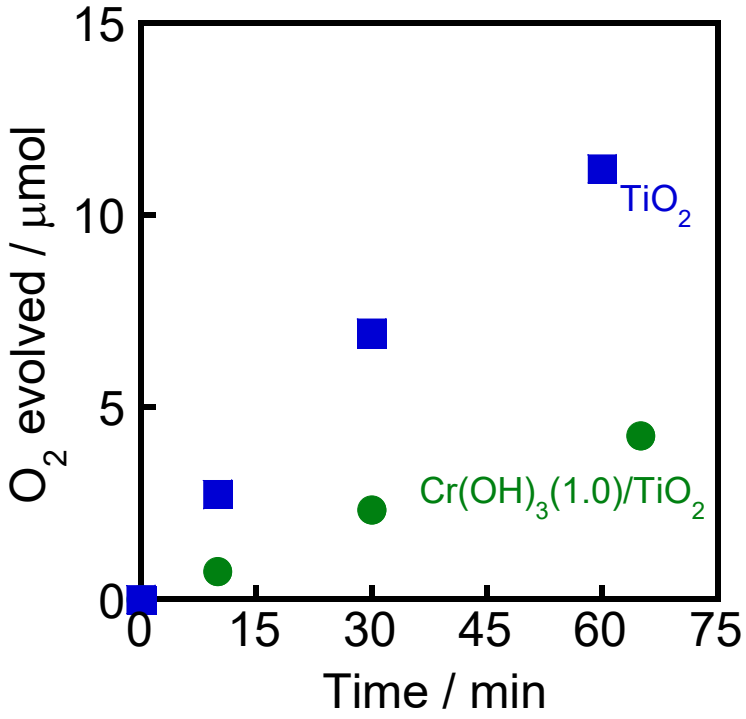

Figure S6 Time courses of the amount of evolved O_2 in an aqueous suspension of $Cr(OH)_3(1.0)/TiO_2$ and TiO_2 under irradiation of UV light from a high pressure mercury lamp.

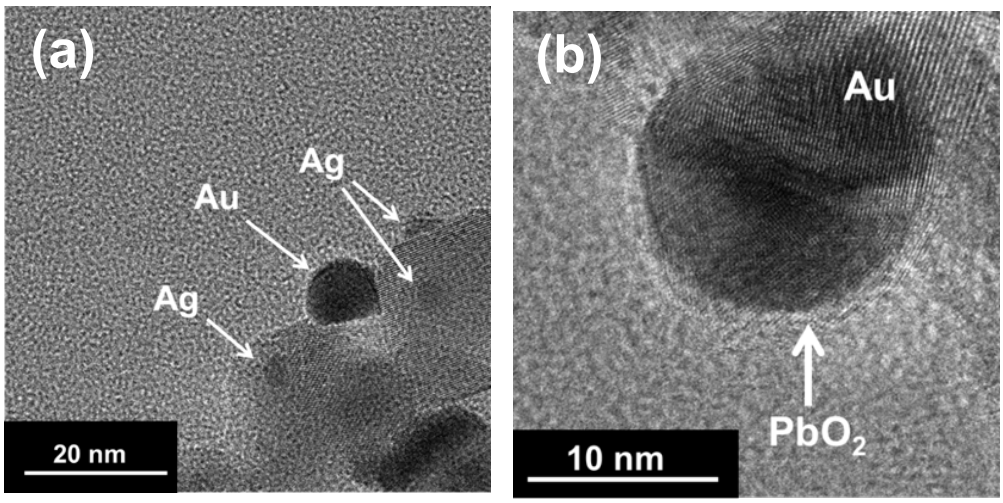

Figure S7 TEM images of $Cr(OH)_3(0.10)/Au/TiO_2$ samples: (a) after photocatalytic oxidation of H_2O to O_2 in the presence of Ag^+ ($AgNO_3$) for 3 h and (b) after photocatalytic reduction of O_2 in the presence of Pb^{2+} ($Pb(NO_3)_2$) for 5 h.

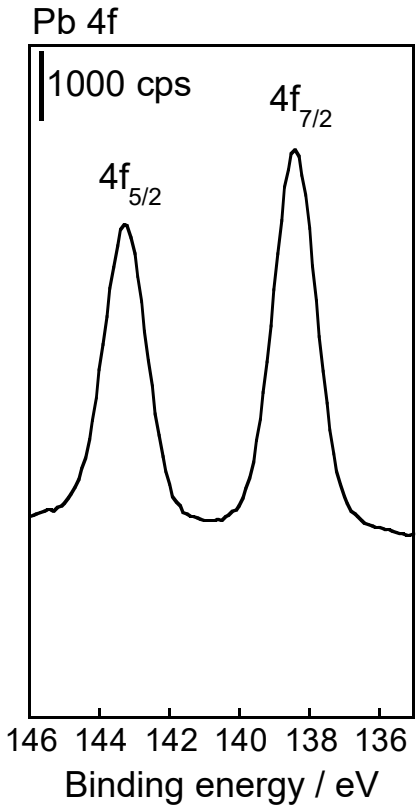

Figure S8 XPS spectrum of $Cr(OH)_3(0.10)/Au/TiO_2$ sample after oxidation of Pb^{2+} to PbO_2 under irradiation of visible light.

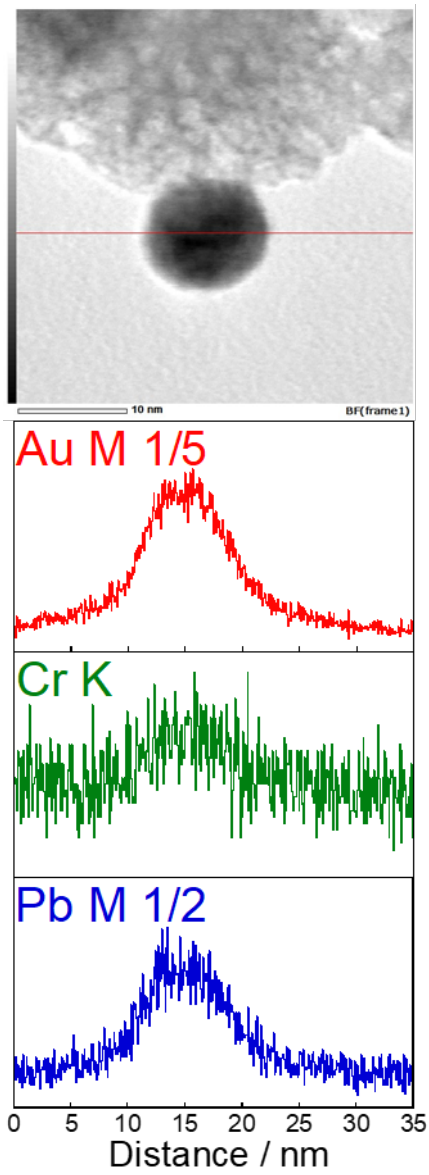

Figure S9 TEM image and EDS spectra of $Cr(OH)_3(0.10)/Au/TiO_2$ after photocatalytic reduction of O_2 in the presence of Pb^{2+} ($Pb(NO_3)_2$) for 5 h.

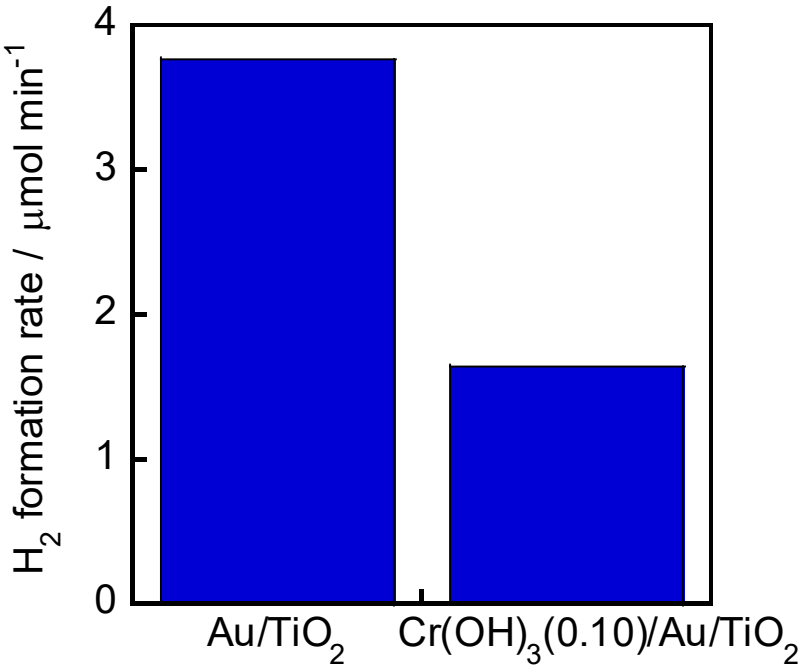

Figure S10 Rates of H_2 evolution from methanol over Au/TiO_2 and $Cr(OH)_3(0.10)/Au/TiO_2$ under irradiation of UV light from a high pressure mercury lamp.