Supplementary Information

Overall water splitting under visible light irradiation over Ir and La-codoped $NaTaO_3$ photocatalysts

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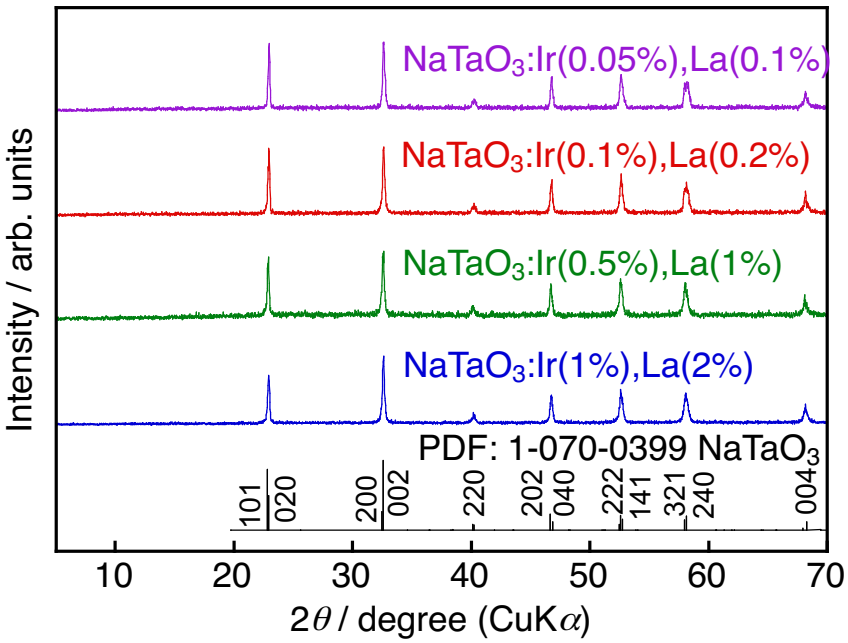

Figure S1 XRD patterns of $NaTaO_3$:Ir(x at%),La(2x at%) prepared at 1423 K by a solid-state reaction.

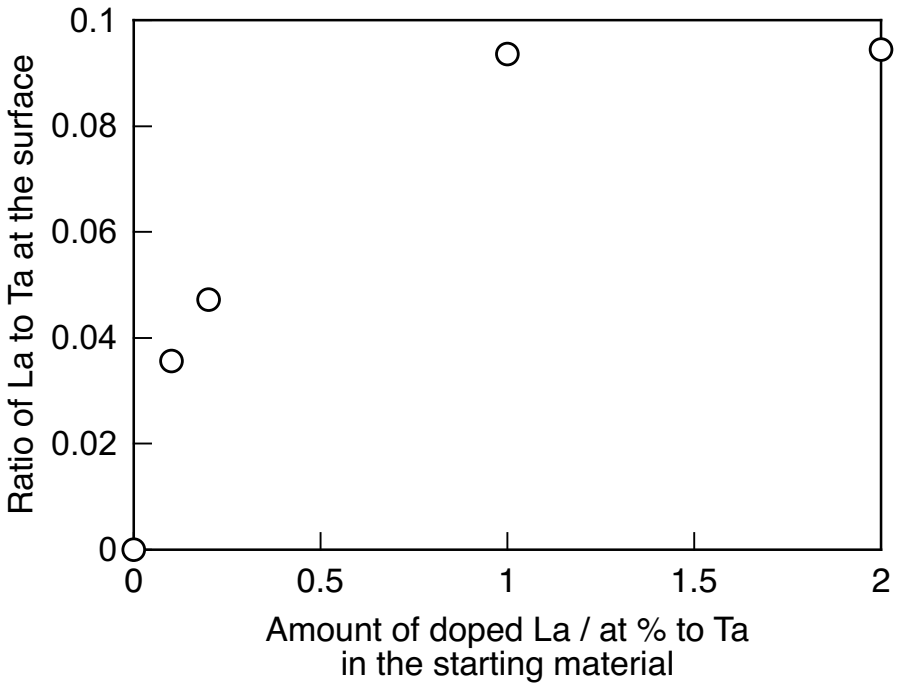

Figure S2 Relationship between the amount of La in the starting material and the ratio of La to Ta at the surface of $NaTaO_3$ estimated from XPS.

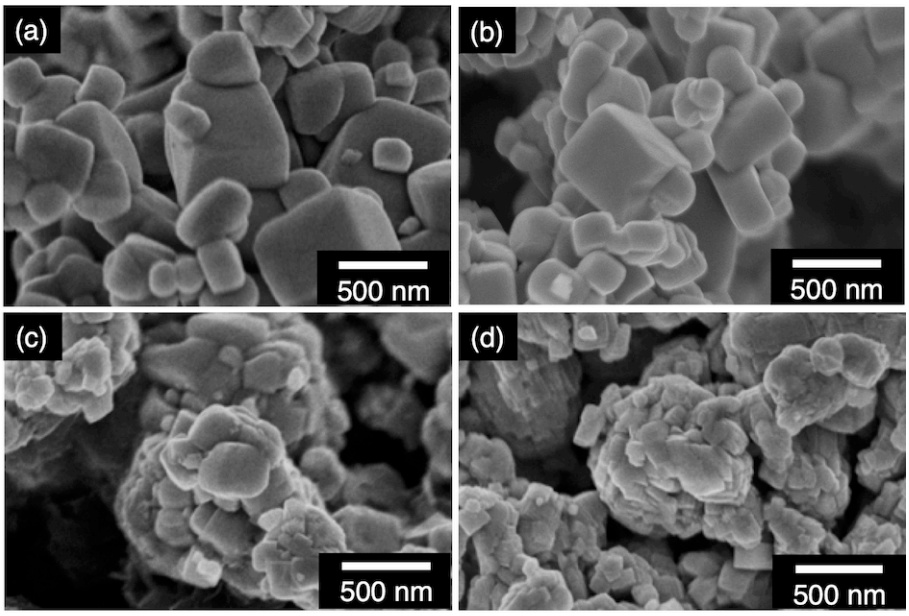

Figure S3 SEM images of $NaTaO_3$:Ir(x at%),La(2x at%) prepared at 1423 K by a solid-state reaction. (a) x = 0.05, (b) x = 0.1, (c) x = 0.5, and (d) x = 1.

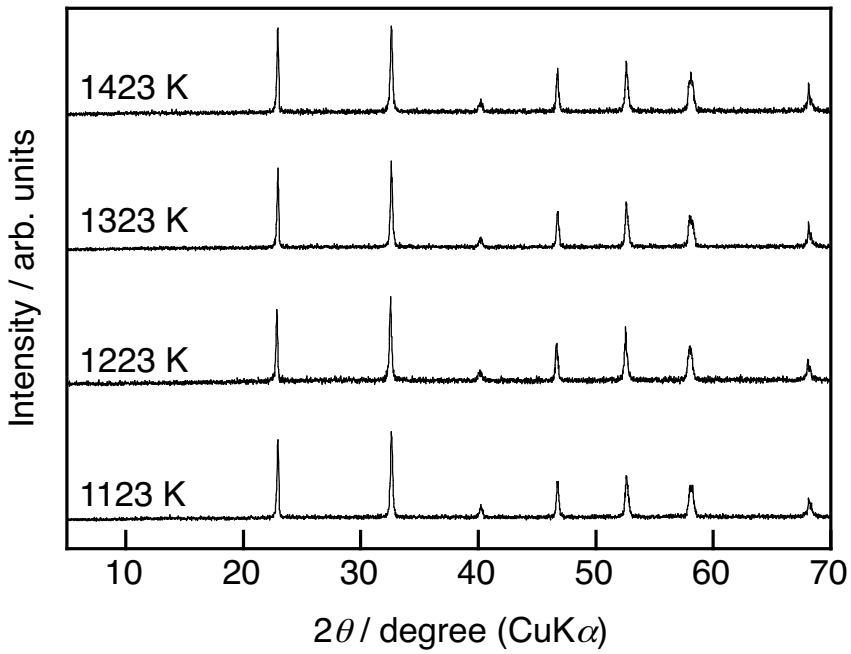

Figure S4 XRD patterns of $NaTaO_3$:Ir(0.1 at%),La(0.2 at%) prepared at various temperatures by a solid-state reaction.

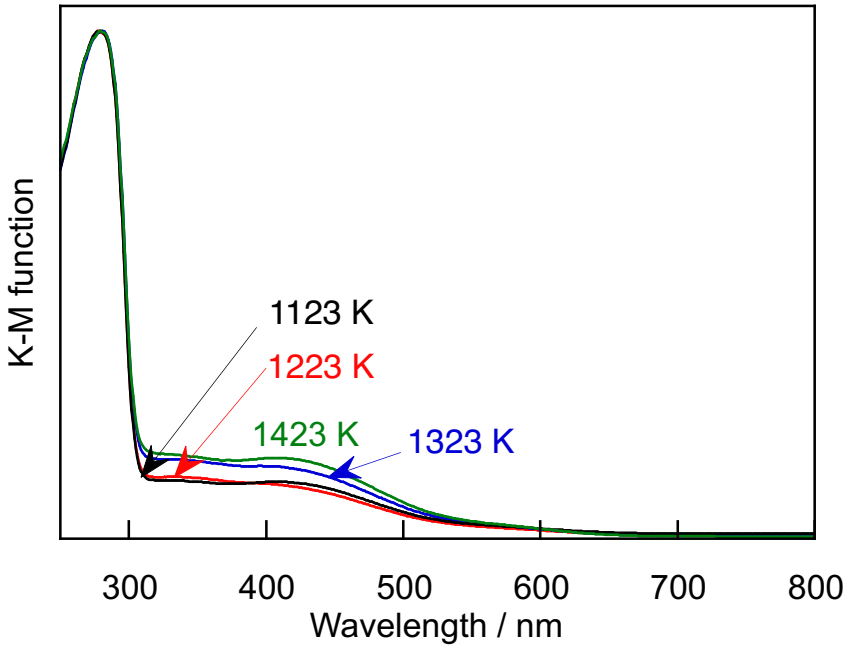

Figure S5 Diffuse reflectance spectra of $NaTaO_3$:Ir(0.1 at%),La(0.2 at%) prepared at various temperatures by a solid-state reaction.

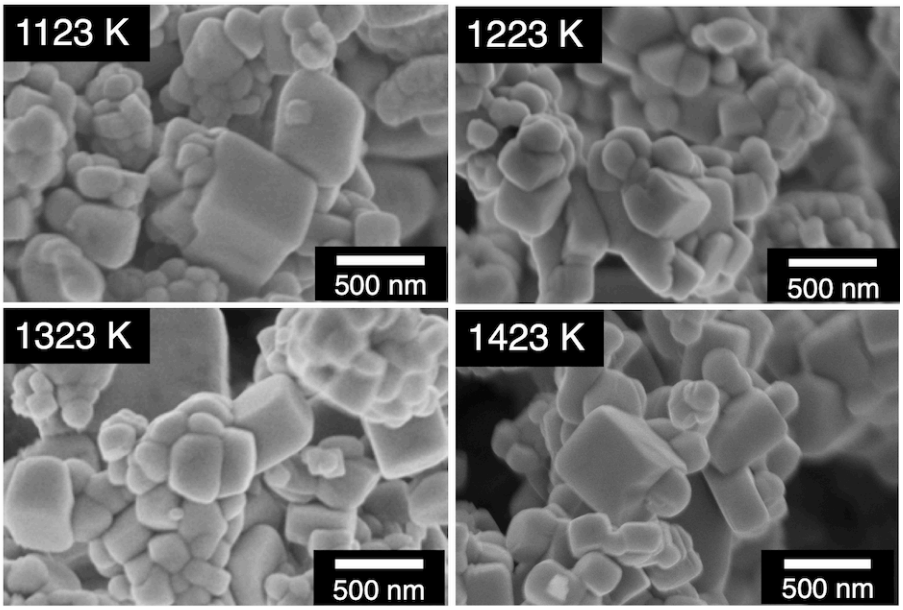

Figure S6 SEM images of $NaTaO_3$:Ir(0.1 at%),La(0.2 at%) prepared at various temperatures by a solid-state reaction.

Table S1 Photocatalytic water splitting under visible light irradiation over Rh(0.05 wt%)/Cr_2O_3(0.038 wt%)-loaded $NaTaO_3$:Ir(0.1 at%),La(0.2 at%)

Calcination temperature / K	Specific surface area / $m^2\ g^{-1}$	Activity / $\mu mol\ h^{-1}$	
		H_2	O_2
1123	2.3	2.1	0.9
1223	2.3	2.2	0.9
1323	2.0	1.0	0.4
1423	1.7	1.0	0.4

Photocatalyst: 0.3 g, reactant solution: water 120 mL, cell: top-irradiation cell with a Pyrex window, light source: 300 W Xe lamp (λ >420 nm, L42 HOYA).

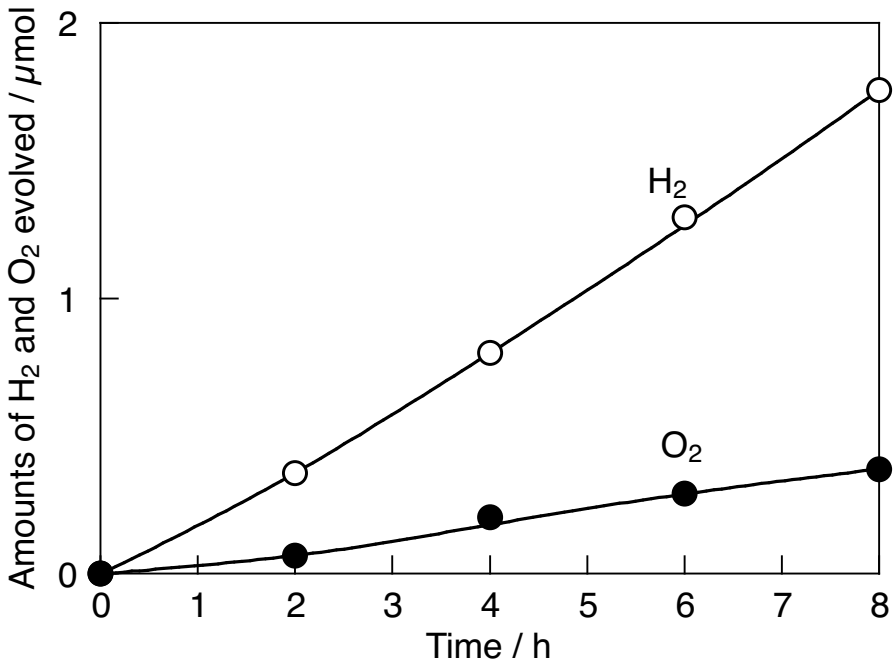

Figure S7 Overall water splitting over NiO(0.2 wt%)-loaded $NaTaO_3$:Ir(0.1%),La(0.2%) under visible light irradiation. Photocatalyst: 0.3 g, reactant solution: water 120 mL, light source: 300 W Xe lamp with a long-pass filter ($\lambda > 420$ nm, HOYA L42), cell: top-irradiation cell with a Pyrex window. The sample was prepared at 1423 K by a solid-state reaction.