Supporting information

Bismuth and chromium co-doped strontium titanates and their photocatalytic properties under visible light irradiation

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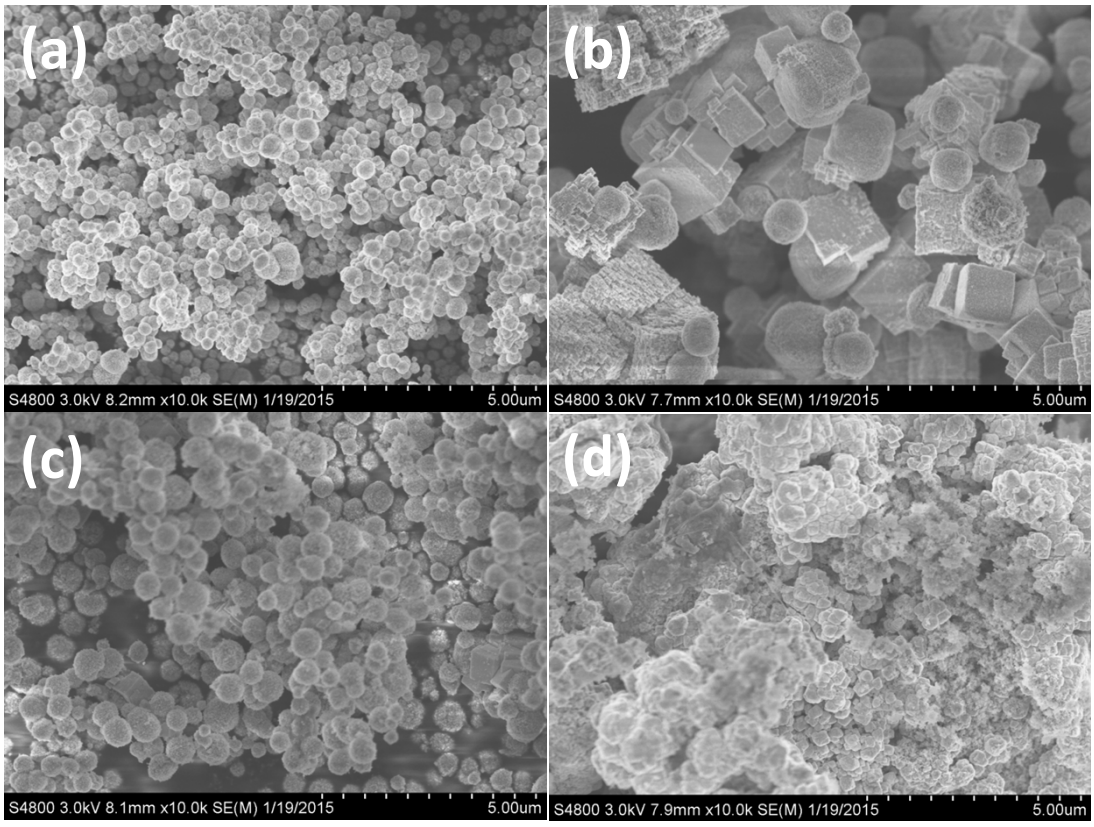

Fig. S1 Field emission scanning electron microscopy images of samples prepared by hydrothermal method. (a) $Sr_{0.9}Bi_{0.1}Ti_{0.9}Cr_{0.1}O_3$, (b) $Sr_{0.85}Bi_{0.15}Ti_{0.85}Cr_{0.15}O_3$, (c) $Sr_{0.8}Bi_{0.2}Ti_{0.8}Cr_{0.2}O_3$ and (d) $Sr_{0.6}Bi_{0.4}Ti_{0.6}Cr_{0.4}O_3$

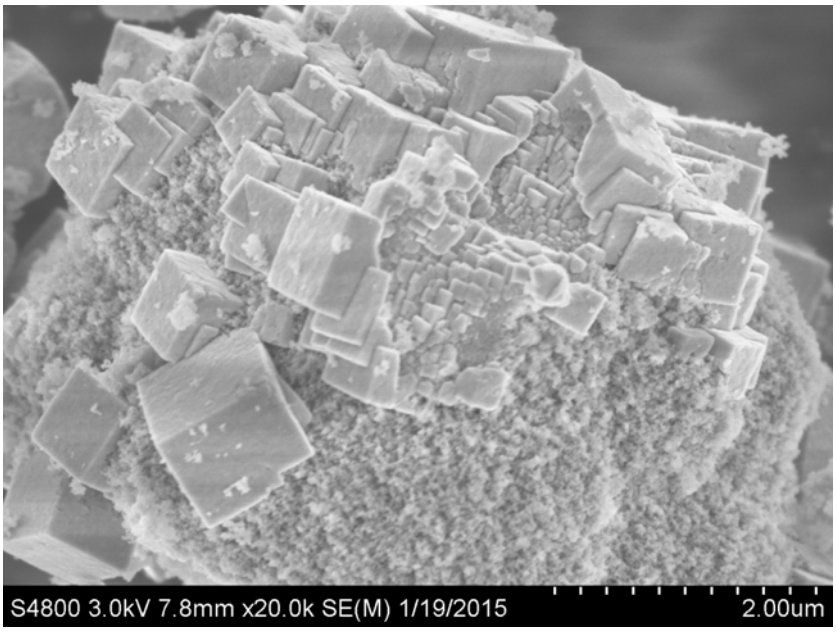

Fig. S2 Field emission scanning electron microscopy image of selected particle in $Sr_{0.85}Bi_{0.15}Ti_{0.85}Cr_{0.15}O_3$ showing self-assembling of cubic structure at the surface

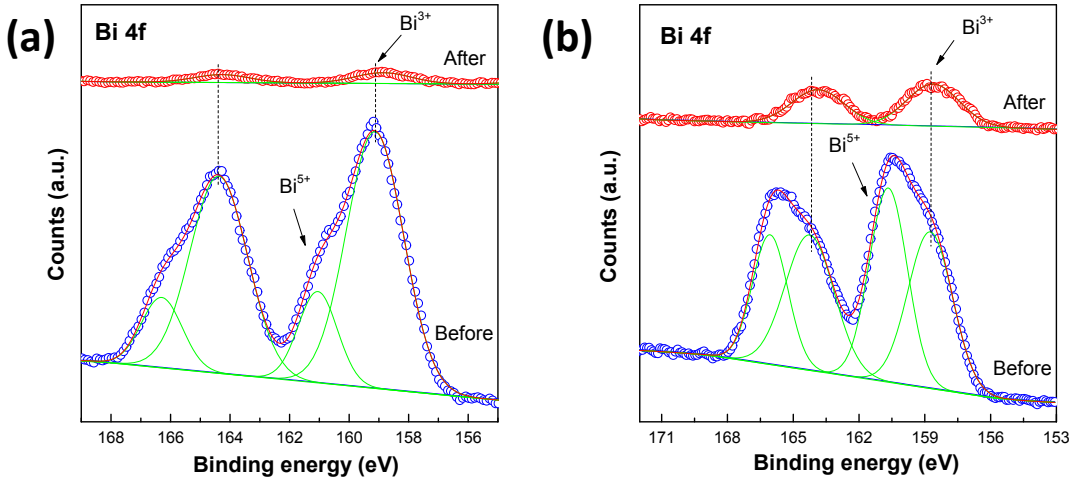

Fig. S3 XPS spectra of Bi 4f peaks before and after photocatalytic hydrogen production, (a) $Sr_{0.5}Bi_{0.5}Ti_{0.5}Cr_{0.5}O_3$ by solid state reactions and (b) $Sr_{0.6}Bi_{0.4}Ti_{0.6}Cr_{0.4}O_3$ by hydrothermal method

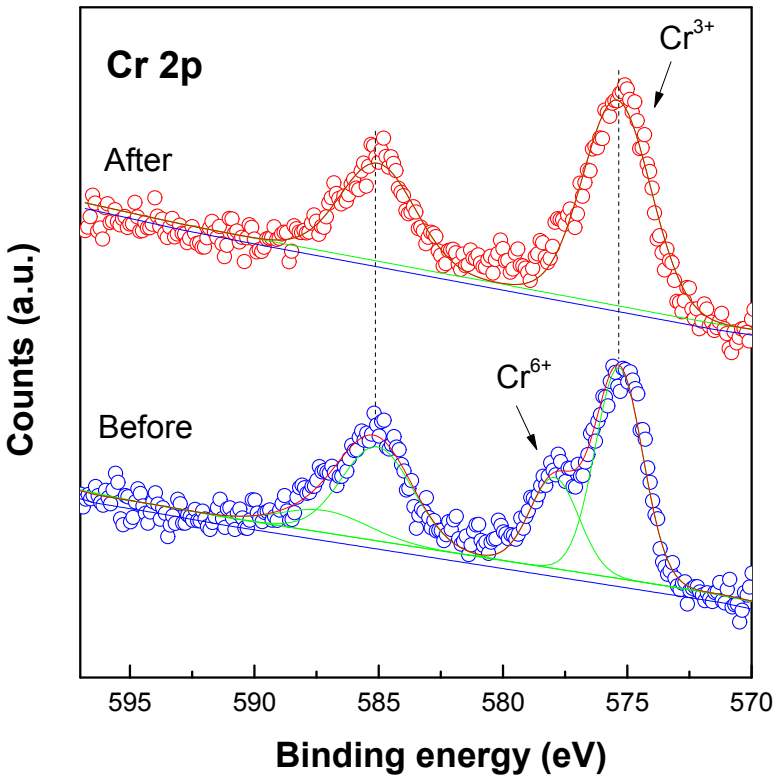

Fig. S4 XPS spectra of Cr 2p peaks before and after photocatalytic for sample $Sr_{0.5}Bi_{0.5}Ti_{0.5}Cr_{0.5}O_3$ by solid state reactions

Table S1 Space group, unit cell parameters and BET surface area of samples prepared by solid state reactions

Sample	Space group	a / Å	V / Å^3	BET surface area / m^2/g
$Sr_{0.9}Bi_{0.1}Ti_{0.9}Cr_{0.1}O_3$	$Pm\bar{3}m$	3.9078(2)	59.680(8)	1.997
$Sr_{0.8}Bi_{0.2}Ti_{0.8}Cr_{0.2}O_3$	$Pm\bar{3}m$	3.9092(1)	59.744(3)	0.195
$Sr_{0.7}Bi_{0.3}Ti_{0.7}Cr_{0.3}O_3$	$Pm\bar{3}m$	3.9097(3)	59.766(10)	0.279
$Sr_{0.6}Bi_{0.4}Ti_{0.6}Cr_{0.4}O_3$	$Pm\bar{3}m$	3.9109(3)	59.822(10)	1.562
$Sr_{0.5}Bi_{0.5}Ti_{0.5}Cr_{0.5}O_3$	$Pm\bar{3}m$	3.9122(2)	59.880(5)	0.540

Table S2 Space group, unit cell parameters and BET surface area of samples prepared by hydrothermal method

Sample	Space group	a / Å	V / Å^3	BET surface area / m^2/g
$Sr_{0.9}Bi_{0.1}Ti_{0.9}Cr_{0.1}O_3$	$Pm\bar{3}m$	3.9133(5)	59.932(23)	16.666
$Sr_{0.85}Bi_{0.15}Ti_{0.85}Cr_{0.15}O_3$	$Pm\bar{3}m$	3.9145(4)	59.987(15)	9.006
$Sr_{0.8}Bi_{0.2}Ti_{0.8}Cr_{0.2}O_3$	$Pm\bar{3}m$	3.9188(6)	60.184(24)	34.454
$Sr_{0.75}Bi_{0.25}Ti_{0.75}Cr_{0.25}O_3$	$Pm\bar{3}m$	3.9148(3)	60.000(11)	23.712
$Sr_{0.6}Bi_{0.4}Ti_{0.6}Cr_{0.4}O_3$	$Pm\bar{3}m$	3.9203(4)	60.254(18)	39.518