

MIL-53(FeNiCo) decorated BiVO₄ photoanode for efficient photoelectrochemical water oxidation

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Preparation of BiVO₄/MIL-53(FeNi_x) (x = 1.6, 2.0, 2.4) photoanodes

1, 4-BDC (0.1 mmol, 16.6 mg), Ni (NO₃)₂ 6H₂O (0.16 mmol, 46.6 mg) and FeCl₃ 6H₂O (0.1 mmol, 27.0 mg) were sequentially added to a Teflon vessel (30 ml) containing 12 mL of DMA. The mixture was then stirred for a few minutes to form a dark yellow solution. The prepared BiVO₄ electrode was placed in the above solution, and it was transferred to a stainless-steel autoclave and heated in an oven at 150 °C for 3 hours. Finally, the photoelectrode was taken out and washed three times with ethanol and water, respectively, and dried at 60 °C for 12 h. MIL-53(FeNi_{2.0}) and MIL-53(FeNi_{2.4}) were prepared using similar procedures except different molar concentration of Ni (NO₃)₂ 6H₂O (0.20 mmol and 0.24 mmol).

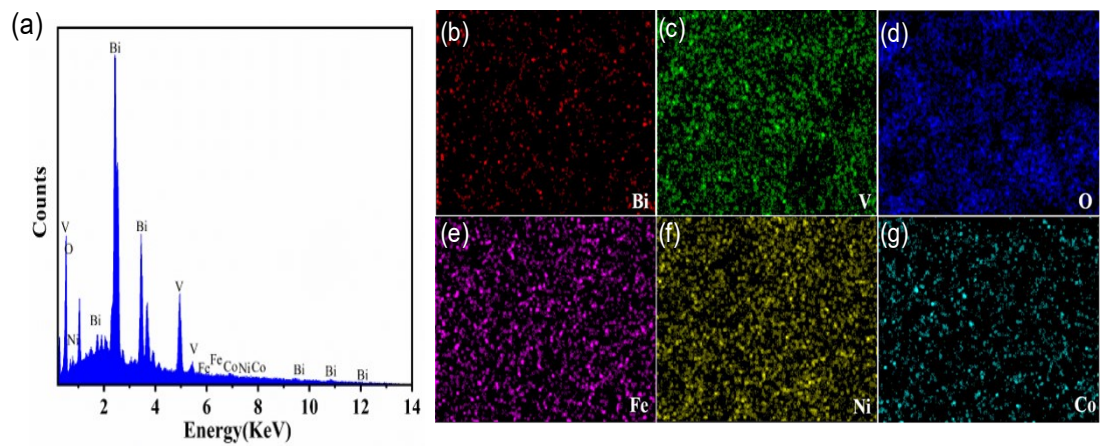


Fig. S1. The corresponding element mapping of $\text{BiVO}_4/\text{MIL-53}(\text{FeNiCo})$.

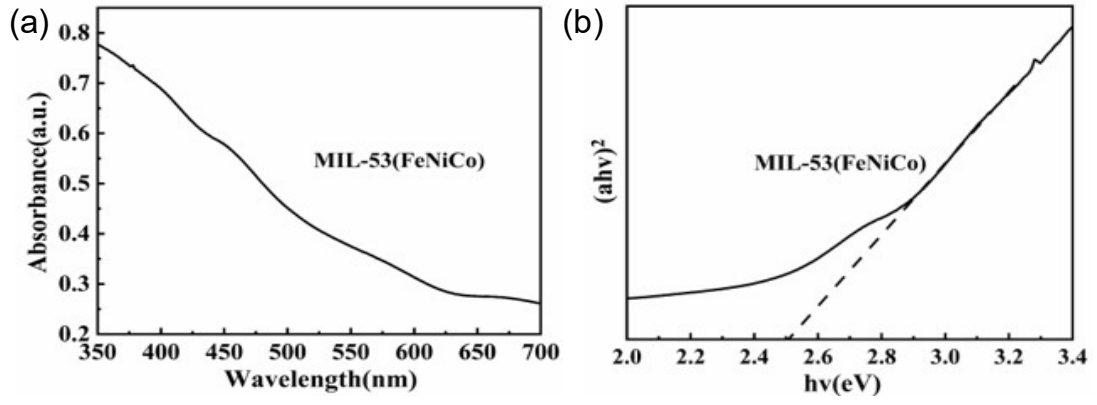


Fig. S2. (a) UV-vis absorption spectra and (d) Tauc plots of MIL-53(FeNiCo).

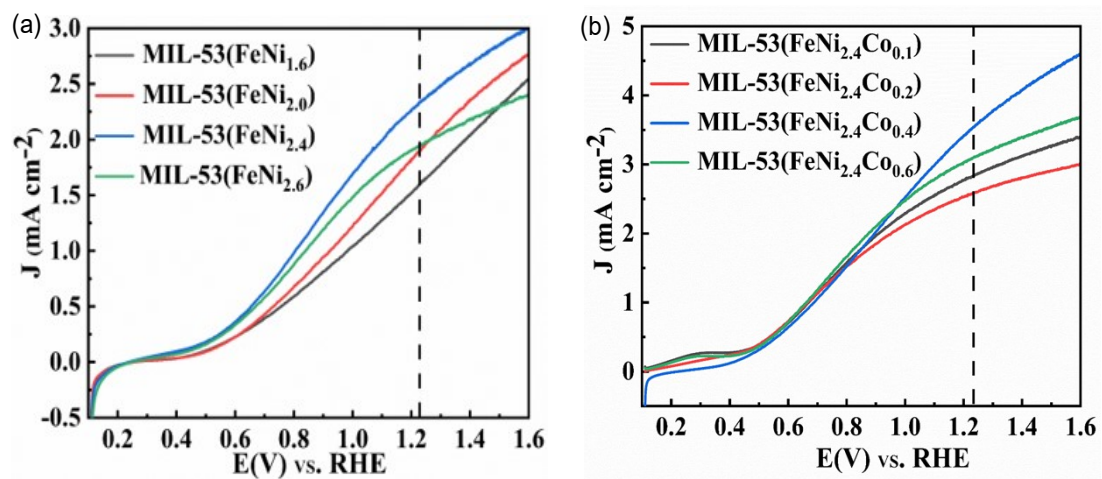


Fig. S3. (a) J-V curves of $\text{BiVO}_4/\text{MIL-53}(\text{FeNi})$ prepared with different molar ratio of Fe, Ni; (b) J-V curves of $\text{BiVO}_4/\text{MIL-53}(\text{FeNiCo})$ prepared with different molar ratio of Fe, Ni, Co.

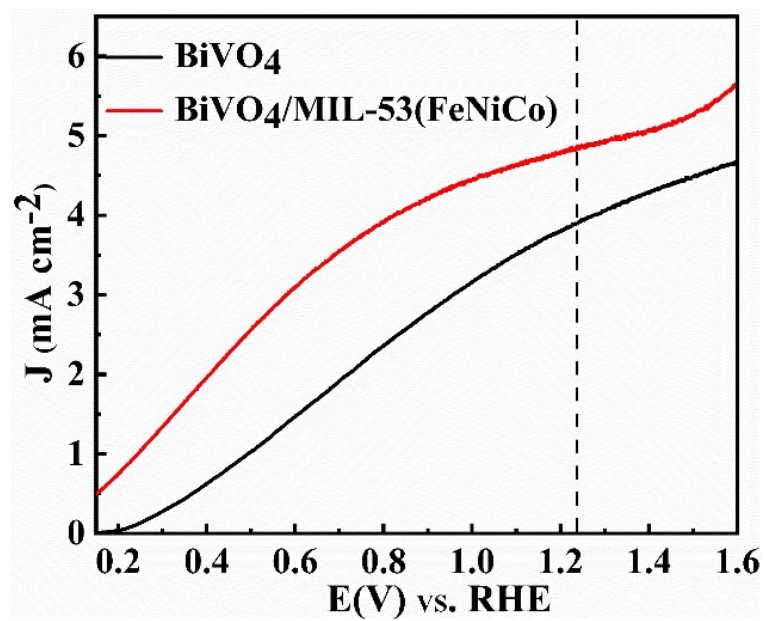


Fig. S4. LSV curves measured with 1M Na_2SO_3 .

Samples	R_s	$R_{ct,bulk}$	$R_{ct,trap}$
BiVO ₄	83.64	179	185.5
BiVO ₄ /MIL-53(FeNiCo)	86.79	73.52	127.1

Tab. S1 Equivalent circuit EIS data of BiVO₄ and BiVO₄/MIL-53(FeNiCo) photoanodes.