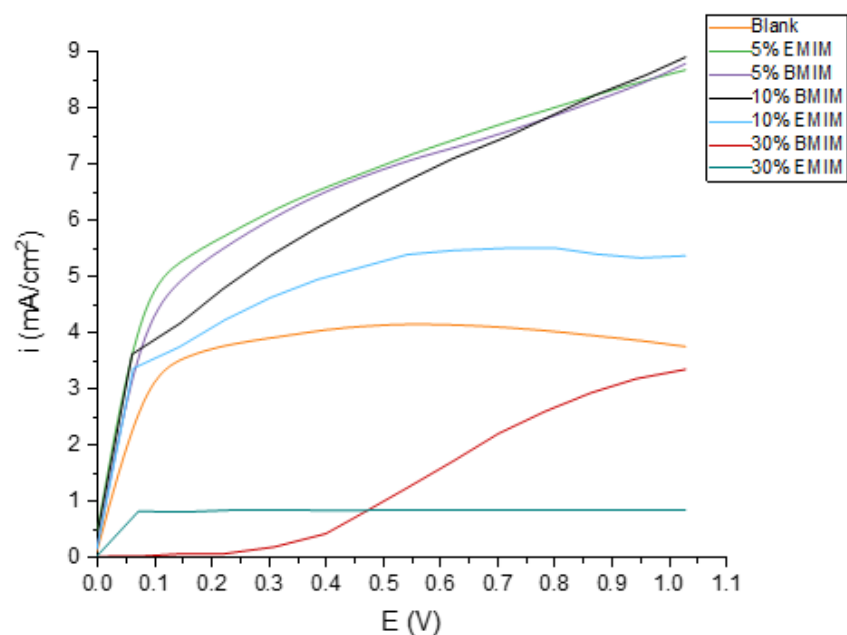
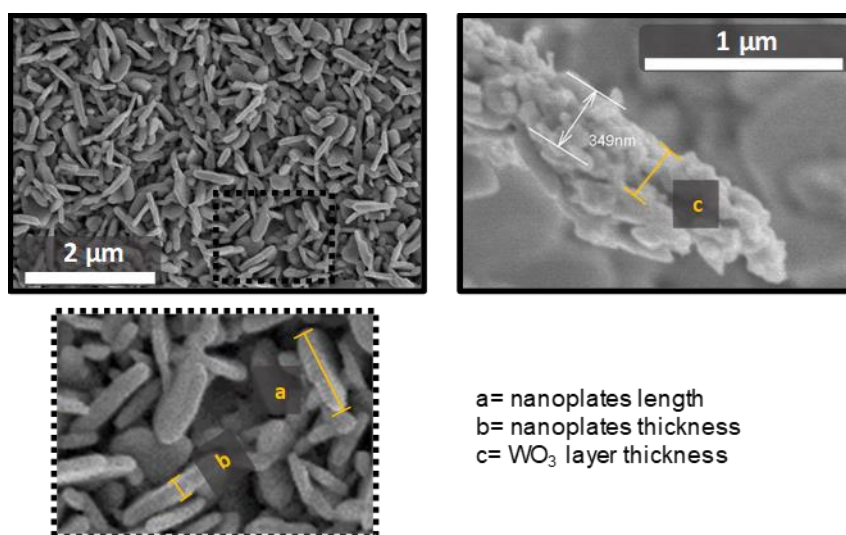


## Supporting Information

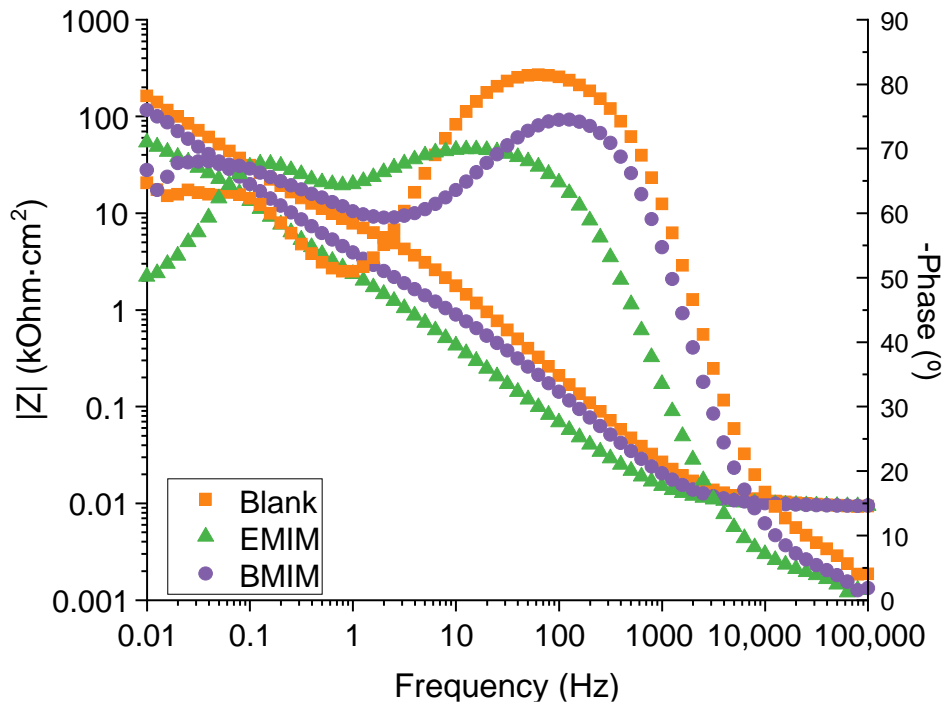
### Anodizing tungsten foil with ionic liquids for enhancing photoelectrochemical applications



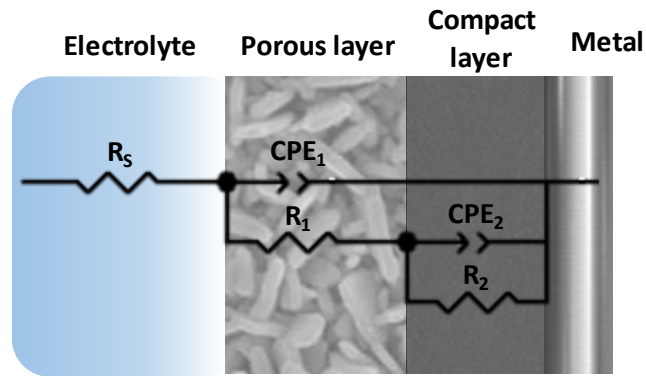
**Figure S1.** Photocurrent transient vs. potential of  $\text{WO}_3$  nanostructures synthesized by electrochemical anodization in different electrolytes (with and without IL) and with different concentrations of BMIM and EMIM (5, 10 and 30%).



**Figure S2.** FESEM images of the  $\text{WO}_3$  nanostructure synthesized by electrochemical anodization with blank electrolyte. Top view (left) and cross section (right).



**Figure S3.** Bode-Module and Bode-phase plots  $\text{WO}_3$  nanostructures formed in electrolytes with and without IL.



**Figure S4.** Equivalent circuit used for EIS fitting.

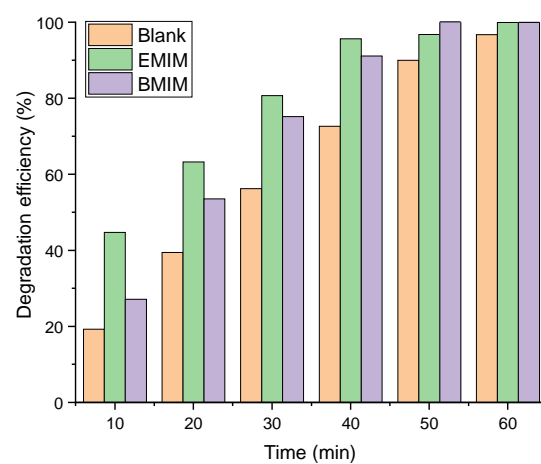
**Table S1.** Results of EIS fitting analysis

Nanostructure	$R_s$ (Ohm)	CPE1-T $F \cdot s^{(\alpha-1)}/\text{cm}^2$	$\alpha_1$	CPE2-T $F \cdot s^{(\alpha-1)}/\text{cm}^2$	$\alpha_2$	$R_2$ (Ohm)
Blank	19.74	1.09E-05	0.9423	4.10E-05	0.7317	1E+20
EMIM	18.48	8.12E-05	0.8133	3.00E-05	0.3896	1E+20
BMIM	18.91	1.97E-05	0.9145	5.30E-05	0.7217	1E+20

Where: impedance values for  $\text{CPE}_i\text{-T}$  are calculated by  $\frac{1}{Y_0 \cdot (j\omega)^{\alpha_i}}$

$R_s$  is the resistance offered by the electrolyte

$R_2$  is the resistance of the bulk.



**Figure S5.** Methyl red degradation efficiency of the different nanostructures.