Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

Electronic Supporting Information

SnO_2/MXene hybrid nanocomposite as negative electrode material for asymmetric supercapacitor

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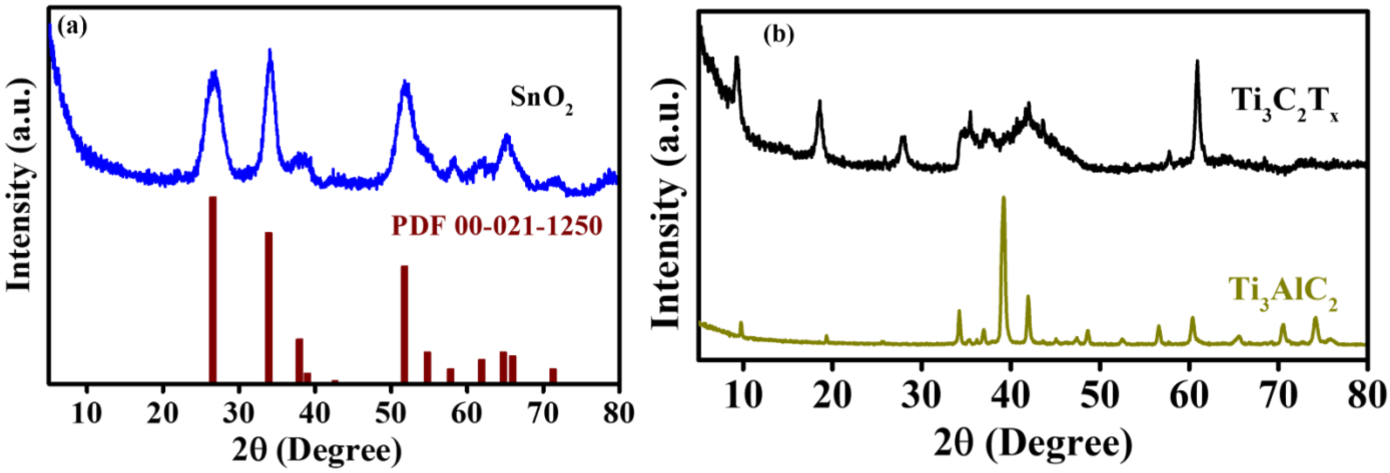

Fig. S1 (a) PXRD pattern of bare SnO_2 matching with PDF card No. PDF 00-021-1250, (b) PXRD pattern of Ti_3AlC_2 and $Ti_3C_2T_x$ suggesting the successful etching of aluminium from Ti_3AlC_2.

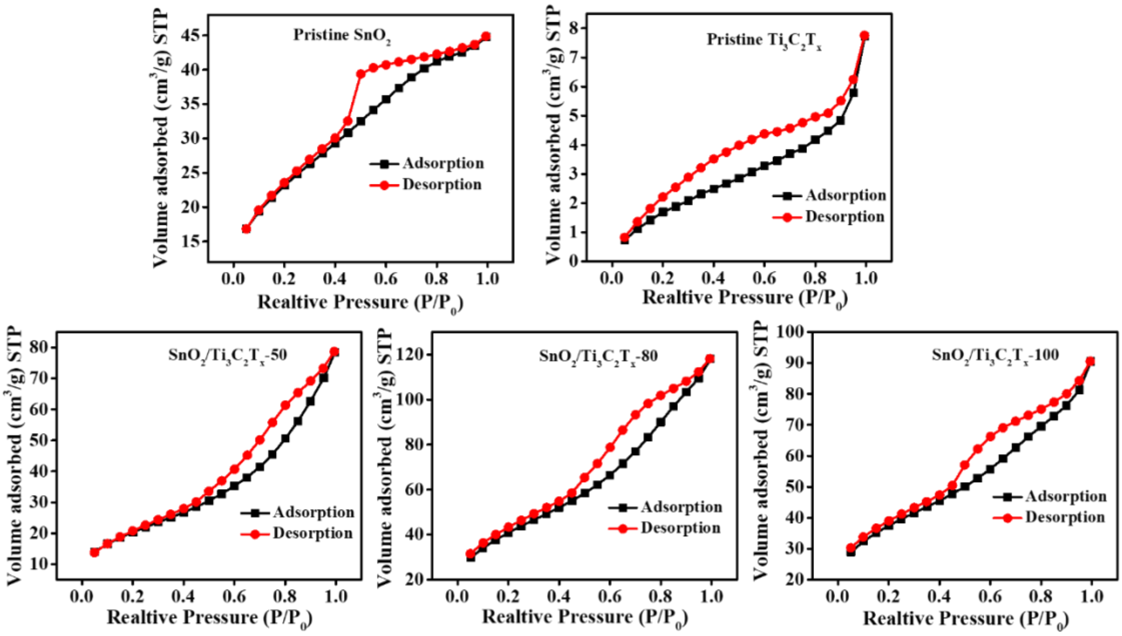

Fig. S2 Adsorption and desorption isotherm for pristine SnO_2, pristine $Ti_3C_2T_x$, $SnO_2/Ti_3C_2T_x$-50, $SnO_2/Ti_3C_2T_x$-80, $SnO_2/Ti_3C_2T_x$-100

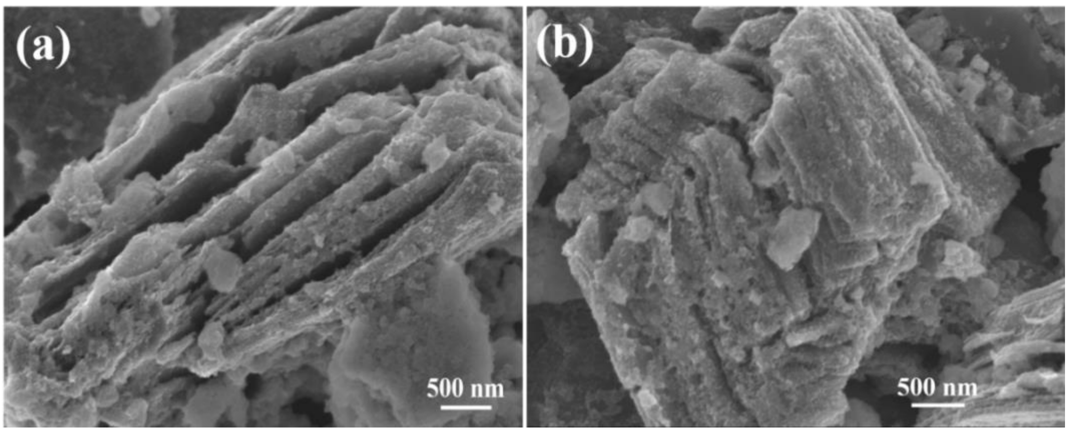

Fig. S3 (a) & (b) SEM image of $SnO_2/Ti_3C_2T_x$-50 and $SnO_2/Ti_3C_2T_x$-100 respectively.

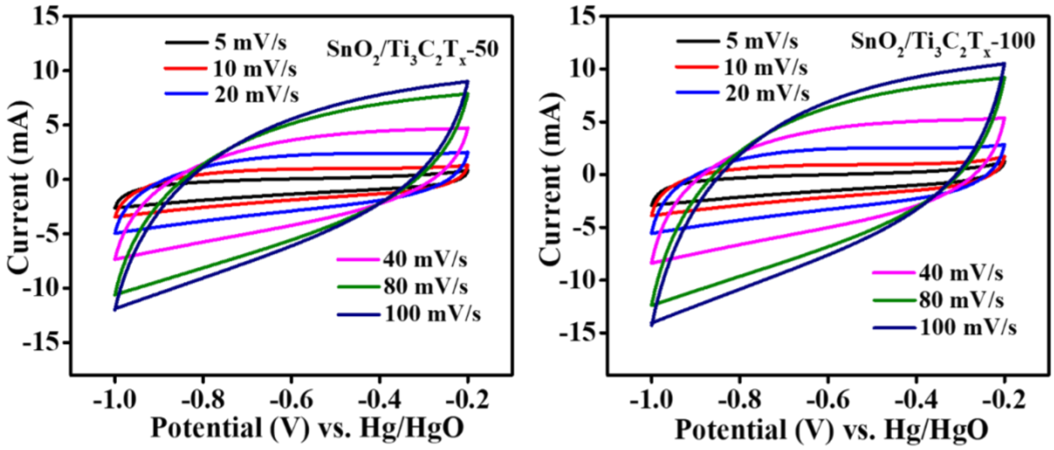

Fig. S4 CV curves of $SnO_2/Ti_3C_2T_x$-50 and $SnO_2/Ti_3C_2T_x$-100

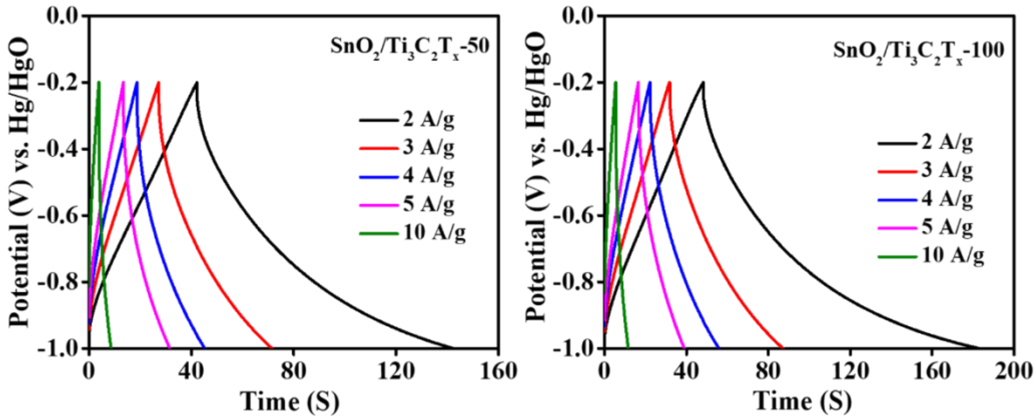

Fig. S5 CV curves of $SnO_2/Ti_3C_2T_x$-50 and $SnO_2/Ti_3C_2T_x$-100

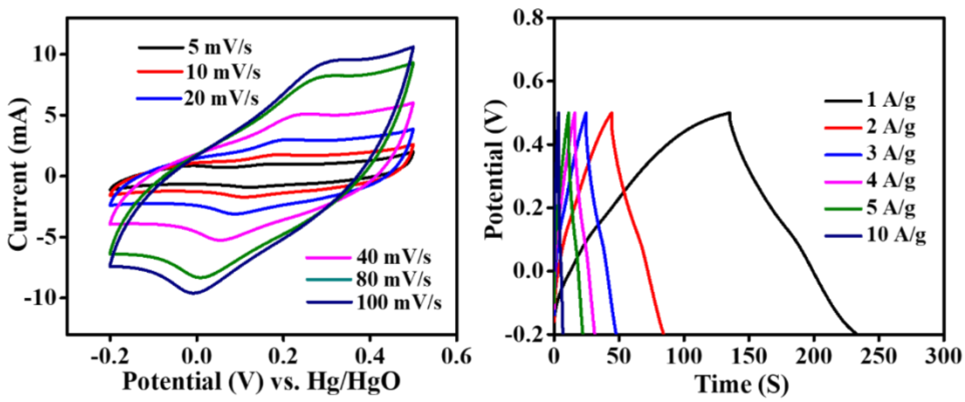

Fig. S6 CV curves of cobalt phosphate

Table S1

Name of the Material	BET surface area (m^2/g)
Pristine SnO_2	66.82
Pristine $Ti_3C_2T_x$	8.76
$SnO_2/Ti_3C_2T_x$-50	91.57
$SnO_2/Ti_3C_2T_x$-80	151.3
$SnO_2/Ti_3C_2T_x$-100	122.2

Table S2

Name	Current Density/Scan Rate	Electrolyte	Specific capacitance (F/g)	Specific Capacitance of the device (F/g)	Cyclic Stability of the device	References
SnO_2@GNSs	0.2 A/g	1 M H_2SO_4	126	**-**		*J. Alloys Compd., 2016, **674**, 44–50*
SnO_2/GNs composite	20 mV/s	30 wt% KOH	195	**-**		*J. Mater. Chem., 2011, **21**, 16197*
APCNFs/SnO_2	1 A/g	3 M KOH	225.4	43.3 F/g	2500 cycles	*Electrochim. Acta, 2019, **308**, 121–130*
RGO/SnO_2 nanocomposite	4.5 A/g	1 M H_2SO_4	396	-		*New J. Chem., 2015, **39**, 8505–8512*
SnO_2/rGO composites	50 mA/g	1 M H_2SO_4	348	-	-	*J. Phys. Chem. C*, 2014, **118**, 15146–15153
SnO_2/SWCNTs core-shell nanowires	6 mV/s	1 M Na_2SO_4	320	-	-	*Powder Technol.*, 2012, **224**, 306–310
SnO_2@C composite	1 A/g	1 M KOH	432	-	-	*Electrochim. Acta, 2021, **365**, 137284*
$SnO_2/Ti_3C_2T_x$-80	**2 A/g**	**3 M KOH**	**620**	**107 F/g**	**15,000 cycles**	**This Work**

Table S3

Name	**BET surface area (m^2 g^{-1})**	**Specific capacitance (F g^{-1})**	**Reference**
300-K–Ag–Ti_3CNT_x	82.63	451	J. Mater. Chem. A, 2022, 10, 18812–18821
VS_2-MX-50	7.33	106.3	ACS Appl. Energy Mater. 2021, 4, 14198−14209
400-KOH- Ti_3C_2	22.6	517	Adv. Energy Mater. 2017, 1602725
BCN/MoS_2-11	22.8	283	Journal of Power Sources 402 (2018) 163–173
3D-BCN-950	649	380	J. Mater. Chem. A, 2018, 6, 21225–21230
BN-HGA-2	249	456	Carbon 159 (2020): 94-101
BNDC	1022.4	504	Journal of Power Sources 400 (2018) 264–276
Nanoporous BCN	506.9	475	Materials Letters 246 (2019) 28–31
$SnO_2/Ti_3C_2T_x$-80	**151.3**	**620**	**This work**