Supplementary Materials

Crystal Structure, Morphology, Optical and Super-Capacitor Properties of Srx: α-Sb₂O₄ Nanostructures

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Table 1S. Elemental compositional analysis of pure $SrCl_3$, pure Sb_2O_4 and $Sr:\alpha-Sb_2O_4$ NS

Samples	Sb	Sr	Na	N	O	Co	K	Si	C	P	Purity
Pure $SrCl_2$ NS	0.05	97.8	1.02	-	0.09	-	0.37	-	-	-	99.33
Pure $\alpha-Sb_2O_4$ NS	96.8	0.07	1.36	-	1.09	-	0.11	-	-	-	99.43
$Sr_x:\alpha-Sb_2O_4$ NS	88.74	10.22	0.17	-	1.44	-	0.31	-	-	-	98.96

Table 2S. Representing crystalline size, Morphology index, Relative Percentage Error, Texture coefficients of Sr: α-Sb$_2$O$_4$ NS

Samples	d-spacing (Å)	Crystallite size (D)	Morphology Index	Relative Percentage error (RPE)	Texture coefficient
(2 wt. %) Sr: α-Sb$_2$O$_4$ NS	2. 195$_{(222)}$	36.12	1.140	0.01935	0.935
(4 wt. %) Sr: α-Sb$_2$O$_4$ NS	2. 199$_{(222)}$	37.02	1.150	0.01966	0.941
(8 wt. %) Sr: Sb$_2$O$_4$ NS	2.254$_{(222)}$	38.54	1.149	0.01948	0.948
(10 wt. %) Sr: Sb$_2$O$_4$ NS	2.267$_{(222)}$	43.547	1.120	0.01996	0.954

Table 3S. Optical absorptivity values of Pure SrCl$_2$, pure α-Sb$_2$O$_4$ and Sr$_x$: α-Sb$_2$O$_4$ (2 wt. %, 4 wt. %, 8 wt. % and 10 wt. %) NS.

Nanostructures	λ_{Max} (nm)	$\lambda_{Shoulder\ 1}$ (nm)	λ_{min} (nm)	Absorptivity Region (nm)
Pure SrCl$_2$ NPs	380	-	-	Ultraviolet
Pure α-Sb$_2$O$_4$ NPs	307	-	-	Ultraviolet
(2 wt. %) Sr: α-Sb$_2$O$_4$ NS	329	350	-	Ultraviolet
(4 wt. %) Sr: α-Sb$_2$O$_4$ NS	332	355	-	Ultraviolet
(8 wt. %) Sr: α-Sb$_2$O$_4$ NS	343	-	391	Ultraviolet
(10wt %) Sr: α-Sb$_2$O$_4$ NS	349	358	-	Ultraviolet

Table 4S. Band assignments, wavenumber for pure $SrCl_2$, α-Sb_2O_4 and Sr_x: α-Sb_2O_4 NS (2, 4, 8 and 10 wt. %)

Samples	Wavenumber /cm	Band Assignments
Pure $SrCl_2$	1522	Sr-OH Stretching
	2987	OH Broad Peak
Pure α-Sb_2O_4	690	Sb-O Bending
	1420	C=O
	3411	OH Broad Peak
2 wt. % Sr: α-Sb_2O_4 NS	1411	C=O Stretching
	1650	Sr-O-Sr Bending
	3121	Sb-OH Broad Peak
	3350	OH Broad Peak
8 wt. % Sr: α-Sb_2O_4 NS	1378	C=O Stretching
	1610	Sr-O-Sr Bending
	2927	Sb-OH Broad Peak
	3395	OH Broad Peak
10 wt. % Sr: α-Sb_2O_4 NS	1371	C=O Stretching
	1672	Sr-O-Sr Bending
	2912	Sb-OH Broad Peak
	3320	OH Broad Peak

Table 5S. Specific capacitance and Rs, Rp, CPE, W of the 10 wt. % of Sr doped α-Sb_2O_4 nanostructures

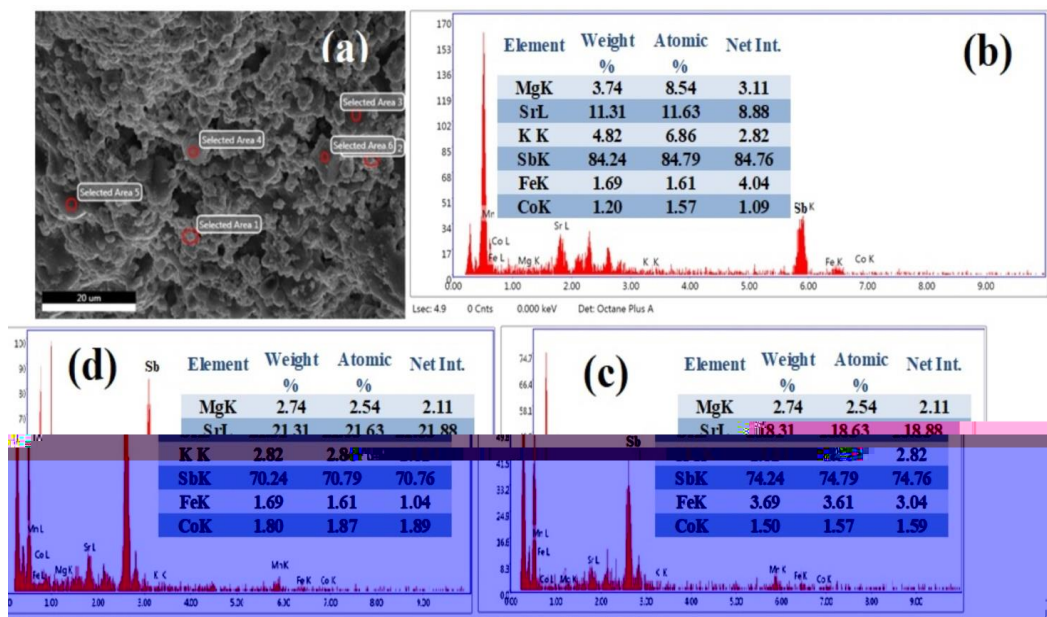| Material	Specific Capacitance (F/g) at 0.1A/g	R_s (Ω)	R_p (Ω)	CPE (mF)	C(mF)	W(m Ω)
(10 wt. %) Sr: α-Sb_2O_4NS	890	0.978	1.95	8.02	40.3	0.514

Figure 1S. SEM EDX compositional analysis of (a) 10 wt. % selected area (b), (c) and (d) are the composition of various metals present the nanostructure.
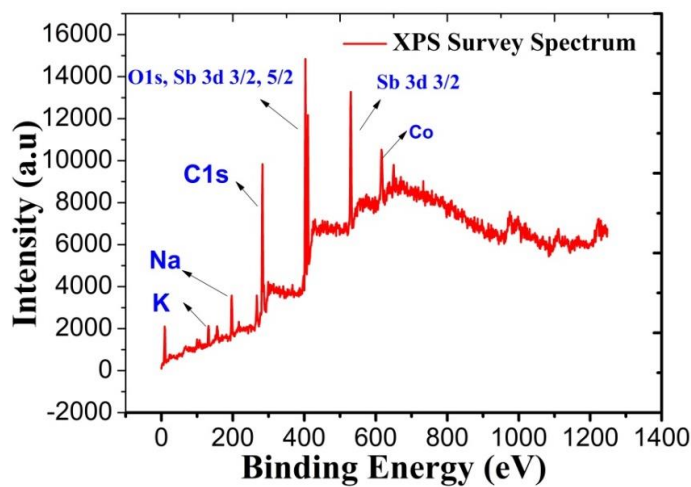

Figure 2S. XPS survey spectrum of Sr_x: α-Sb_2O_4 NS