

## Supplementary Information

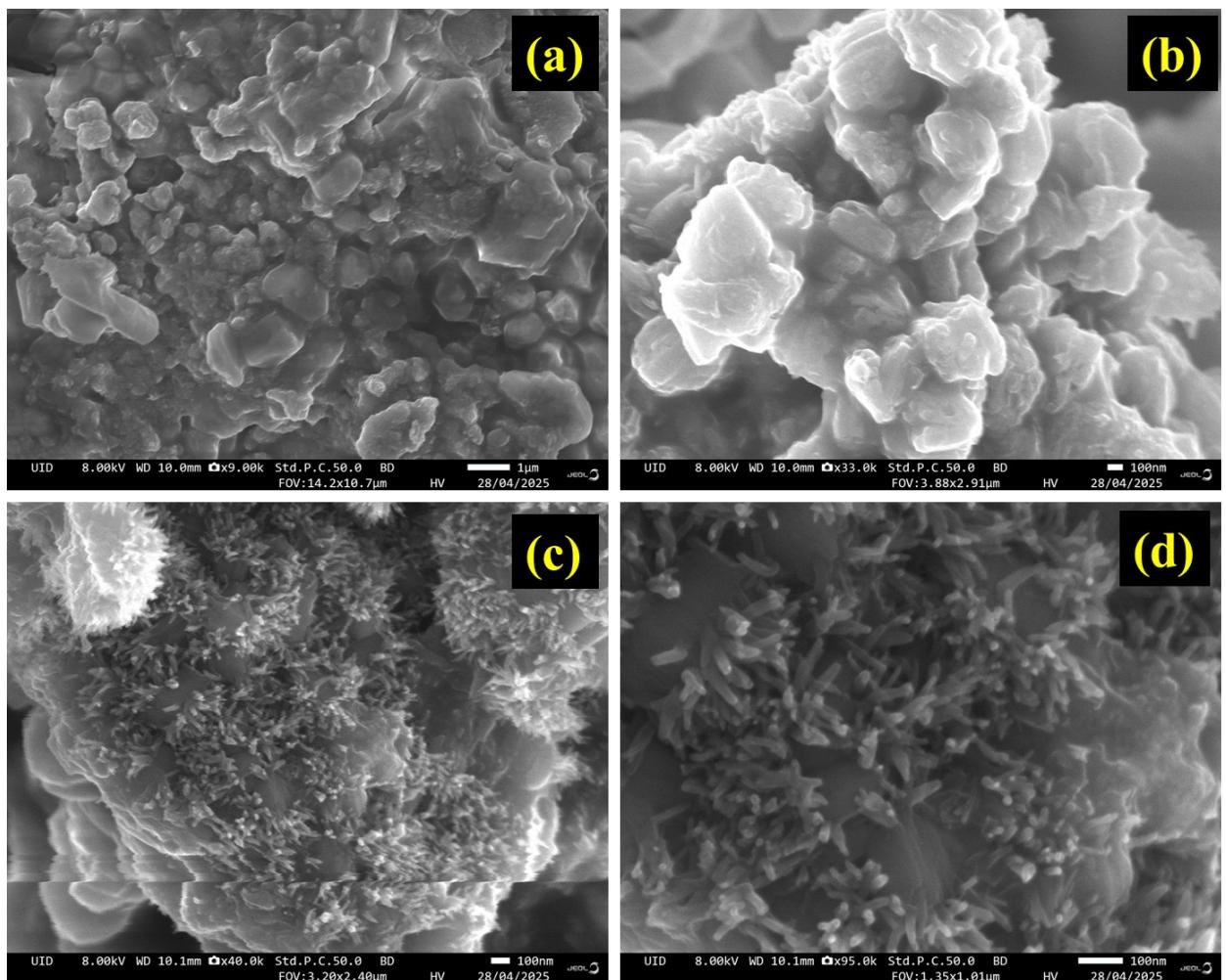
### VS4-NiAl LDH Composite Electrodes for Next-Generation High- Performance Supercapacitors

Rajesh Katru<sup>a</sup>, Rakshita Muddamalla<sup>a</sup>, Kamakshaiah Charyulu Devarayapalli<sup>b</sup>, Haranath

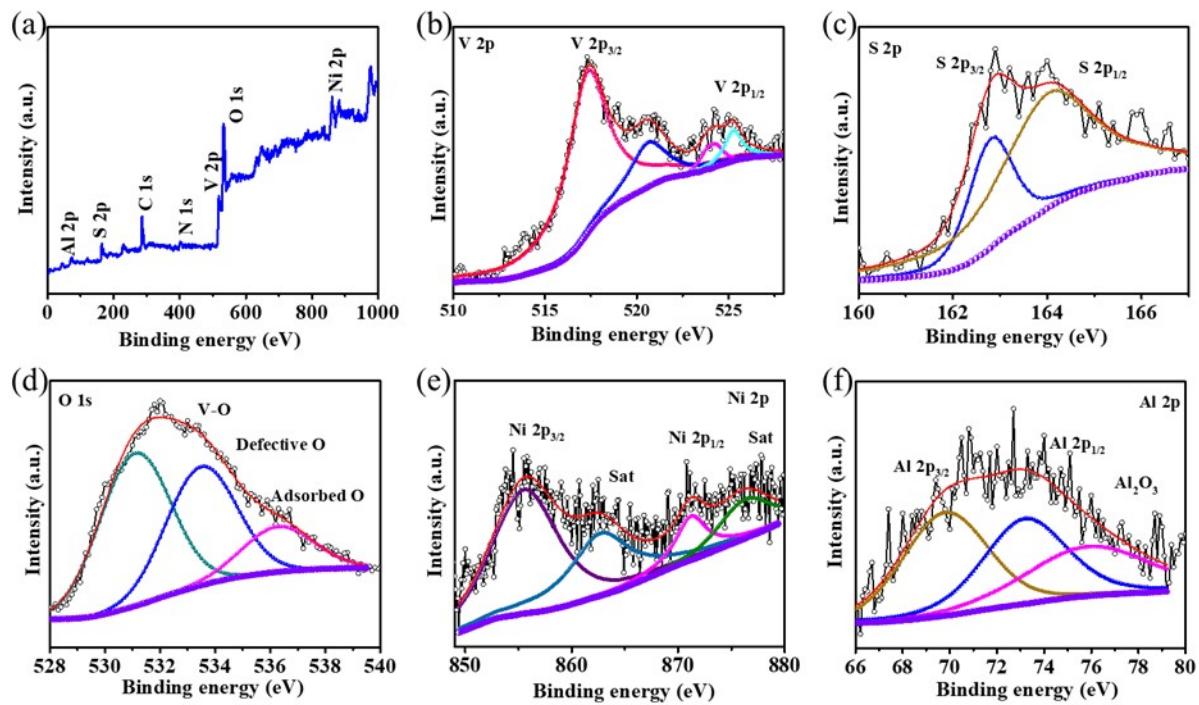
Divi<sup>a</sup>, Rakesh Kumar Rajaboina<sup>a</sup>, Uday Kumar Khanapuram<sup>a\*</sup>, Dae Sung Lee<sup>b\*</sup>

<sup>a</sup>Department of Physics, Energy Materials and Devices (EMD) Lab, National Institute of Technology-Warangal-506004, India.

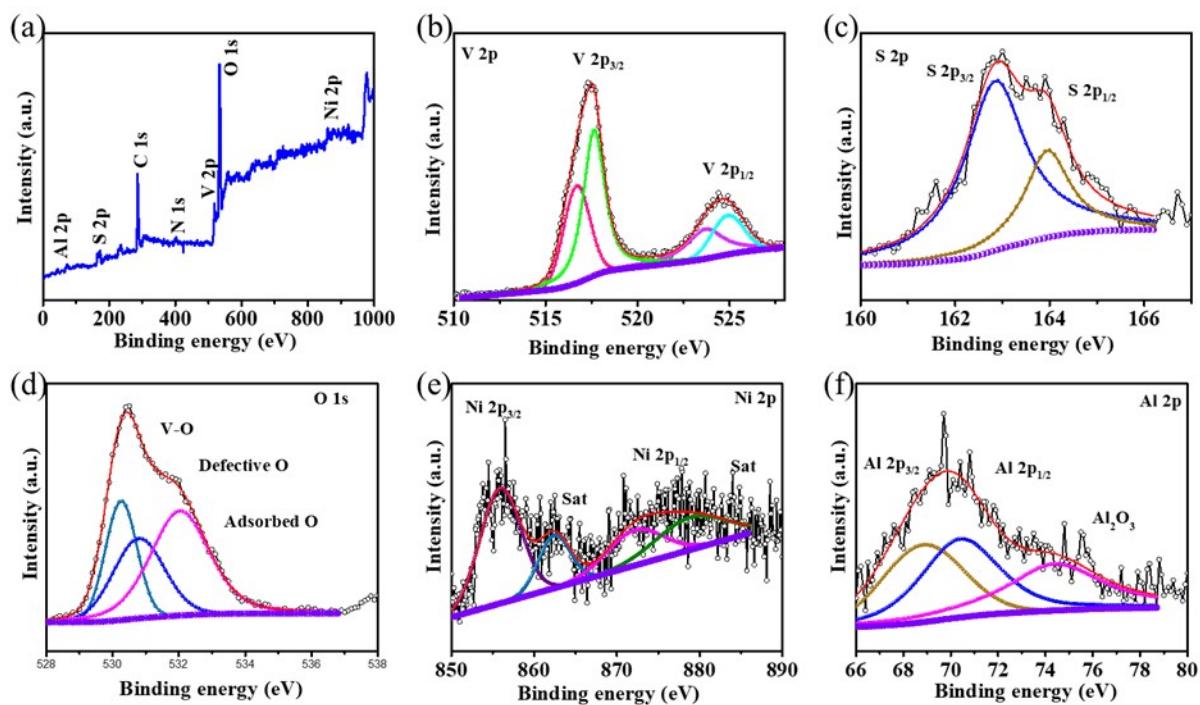
<sup>b</sup>Department of Environmental Engineering, Kyungpook National University, Buk-gu, Daegu 41566, Republic of Korea.



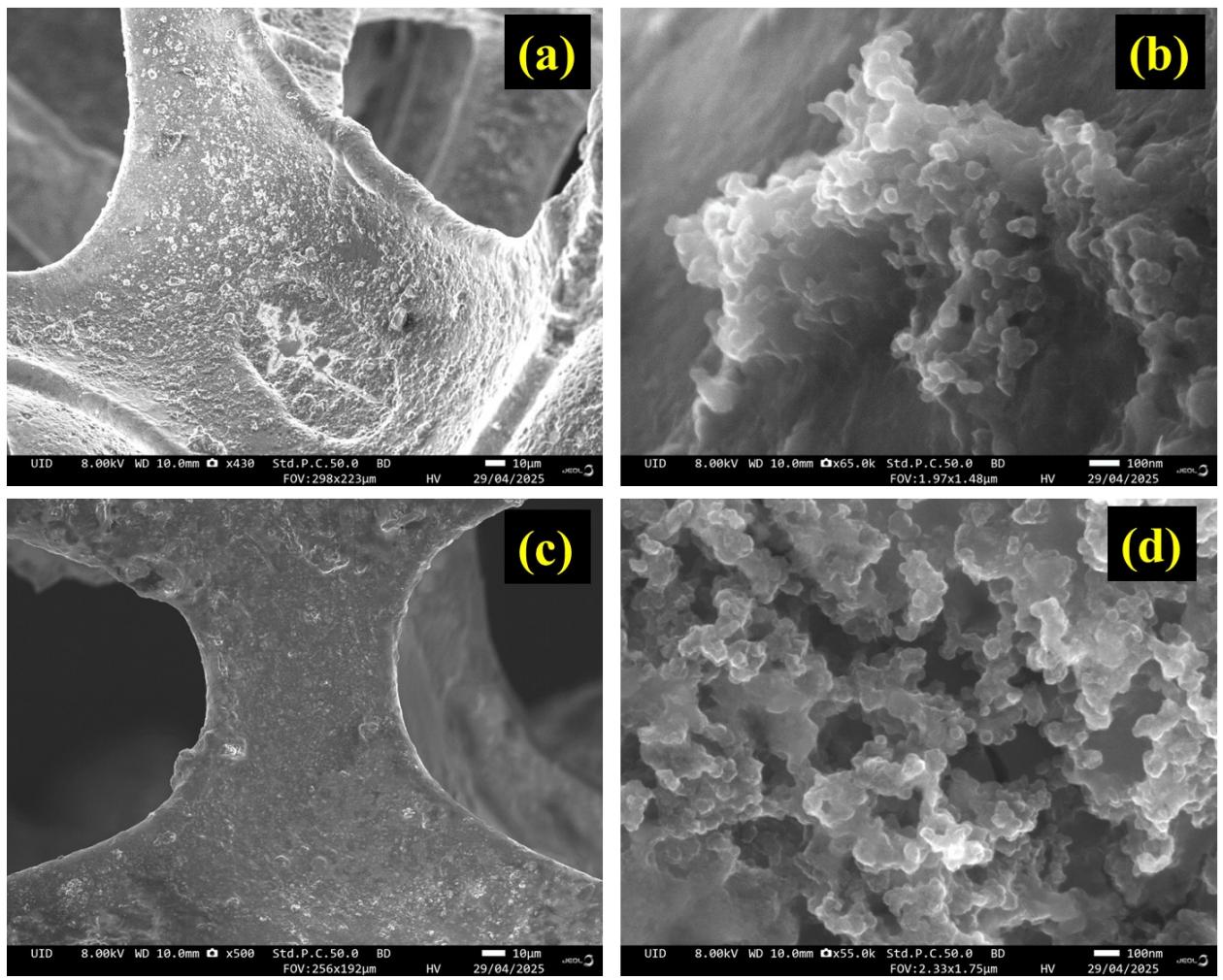
**Fig. S1** FESEM images (a,b) VS<sub>4</sub>+LDH (2.5%), (c,d)VS<sub>4</sub>+LDH (7.5%) low and high magnification images



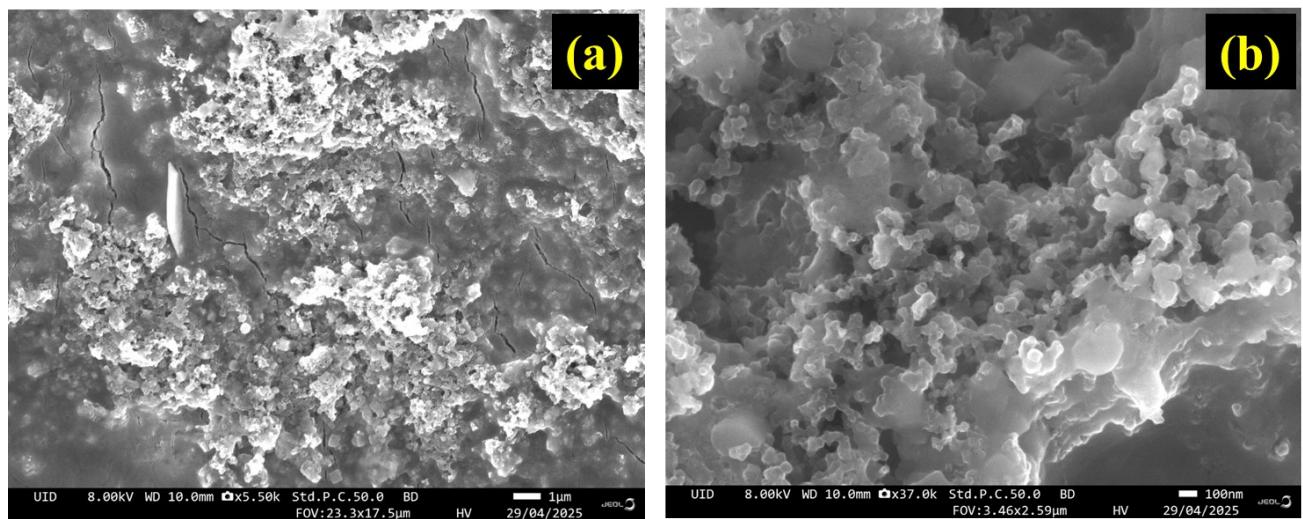
**Fig. S2** (a) Wide range XPS survey spectrum, (b) V 2p (c) S 2p, (d) O 1s, (e) Ni 2p, (d) Al 2p of VS<sub>4</sub>+LDH (2.5%) composite material.



**Fig. S3** (a) Wide range XPS survey spectrum, (b) V 2p (c) S 2p, (d) O 1s, (e) Ni 2p, (d) Al 2p of VS<sub>4</sub>+LDH (7.5%) composite material.



**Fig. S4** (a, b) FESEM images Pre-Cycled VS<sub>4</sub>+LDH (5%), (c,d) 5000 post-cycled VS<sub>4</sub>+LDH (5%)



**Fig. S5:** (a) FESEM images Pre-Cycled VS<sub>4</sub>+LDH (5%), (b) 2500 post-cycled VS<sub>4</sub>+LDH (5%)