Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Ultrathin Petal-like NiAl Layered Double oxide/sulfide Composites as Advanced Electrode for High-performance Asymmetric Supercapacitor

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Table S1. Elements composition (at%) of the NiAl LDO/LDS composites analyzed by XPS

Sample	Element				
	Ni	Al	O	S	C
NiAl LDO/LDS	31.65	8.76	35.71	5.06	18.82

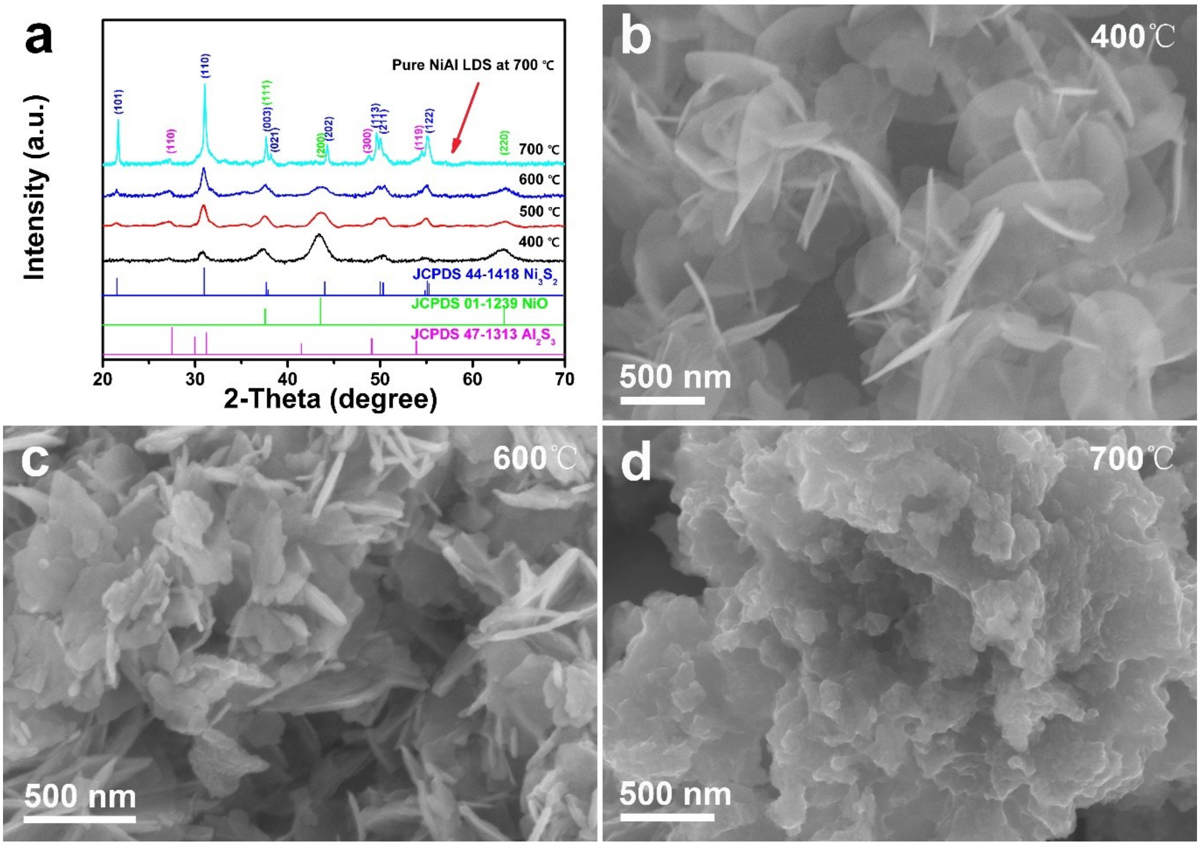

Fig. S1. (a) XRD pattern of NiAl LDO/LDS composites at different sulfidation temperature, and the corresponding SEM images of (b) 400 °C，(c) 600 °C and (d) 700 °C.

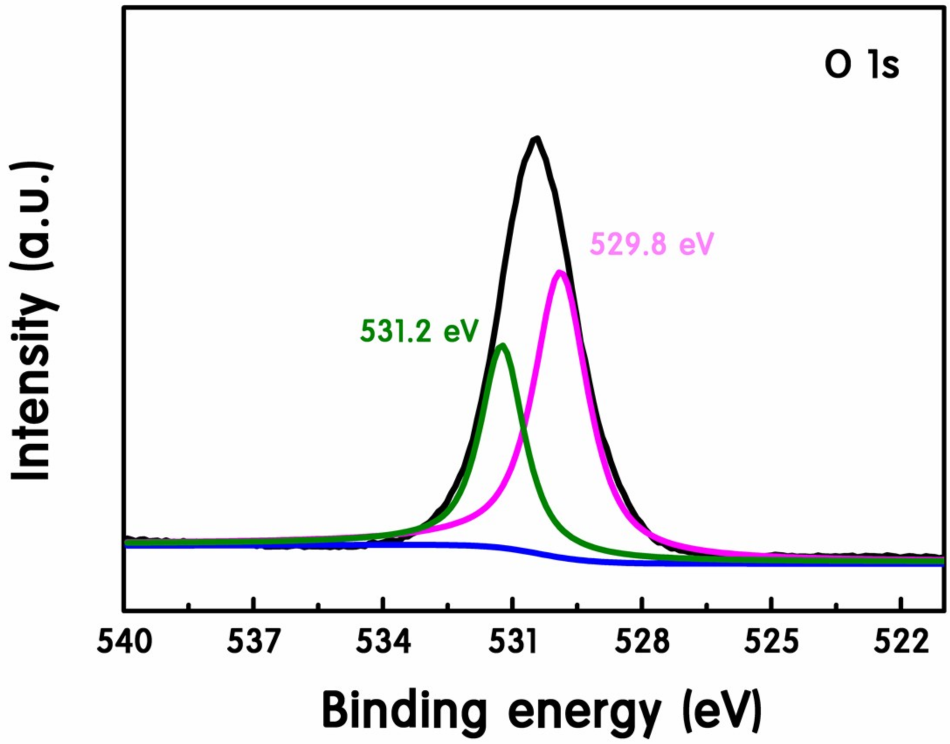

Fig. S2. XPS pattern of the oxygen element in the NiAl LDO/LDS composites.

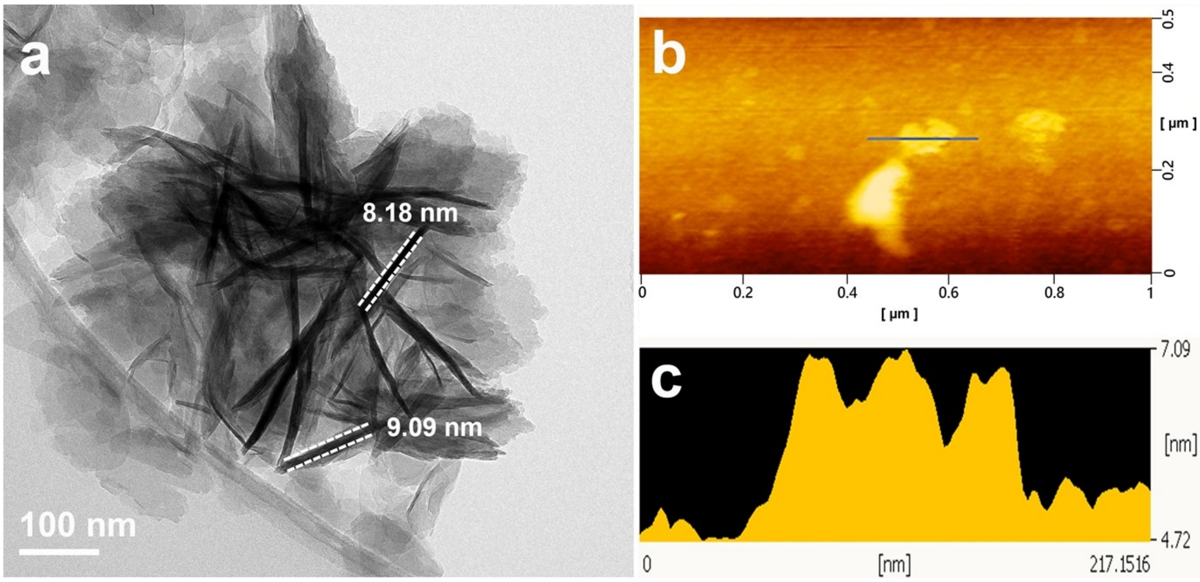

Fig. S3. (a) TEM image, (b) AFM image, and (c) height profile of the NiAl LDO/LDS composites.

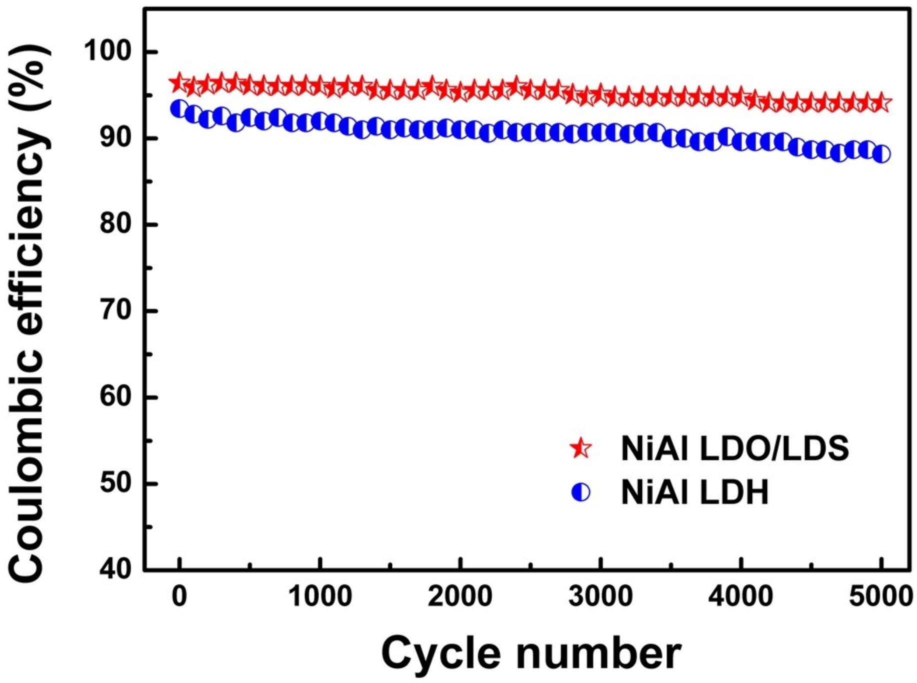

Fig. S4. Cycling performance and Coulombic efficiency of the NiAl LDH and NiAl LDO/LDS composites at a current density of 5 A g^{-1}.

Table S2. EIS fitting parameters of NiAl LDH and NiAl LDO/LDS electrodes

Sample	R_s (Ω)	C_{dl} (F)	R_{ct} (Ω)	W (Ω)	C_F (F)
NiAl LDH	0.665	0.0024	12.53	2.452	1.94
NiAl LDO/LDS	0.499	0.0058	0.308	2.612	3.52

Table S3. Comparison of the electrochemical performance of the NiAl LDO/LDS composites with the reported materials in literature

Materials	Current density ($A\ g^{-1}$)	Specific capacitance ($F\ g^{-1}$)	Ref.
$CoNi_{0.5}LDH$	1	1938	[1]
$Ni_{1-x}Co_xAl$-LDH	1	1902	[2]
CNTs/NiAl-LDH	1	694	[3]
MXene/NiAl LDH	1	1061	[4]
$NiCo_2O_4$@NiCoAl-LDH	1	1814.24	[5]
Co_3O_4@NiCoAl-LDH	1	1104	[6]
Ni_3S_2	1	1670	[7]
Ni_3S_2@$Ni(OH)_2$/G	5.1	1037.5	[8]
NiO/Ni_3S_2	1	2153	[9]
$MnCo_2S_4$	1	2067	[10]
NiS_2	1	1020.2	[11]
NiS_2/ZnS	1	1198	[12]
Nickel sulfides/MoS_2	0.5	757	[13]
Ni_3S_2/NiS	2	1158	[14]

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