Electronic Supplementary Material (ESI) for Nanoscale Advances.

Supporting Information

One-step facile synthesis of nickel-chromium layered double hydroxides nanoflakes for high-performance supercapacitors

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Cleaning of Ni foam

The nickel foam should be cleaned before being loaded with the active materials. The nickel foams were ultrasonic treated for 1 h in 1 M HCl, then washed with ethanol (10 mL) and deionized water (10 mL) for three times, respectively. Finally, the Ni foam was dried at 70 ℃ for 12 h in vacuum.

Table S1. Textural properties of Ni_1Cr_1-LDNs, Ni_2Cr_1-LDNs and Ni_3Cr_1-LDNs.

Simples	S_{BET} ($m^2\ g^{-1}$)	V_{total} ($cm^3\ g^{-1}$)	Size adsor (Å)
Ni_1Cr_1-LDNs	62.541	0.065	18.053
Ni_2Cr_1-LDNs	73.416	0.073	28.061
Ni_3Cr_1-LDNs	63.286	0.068	21.067

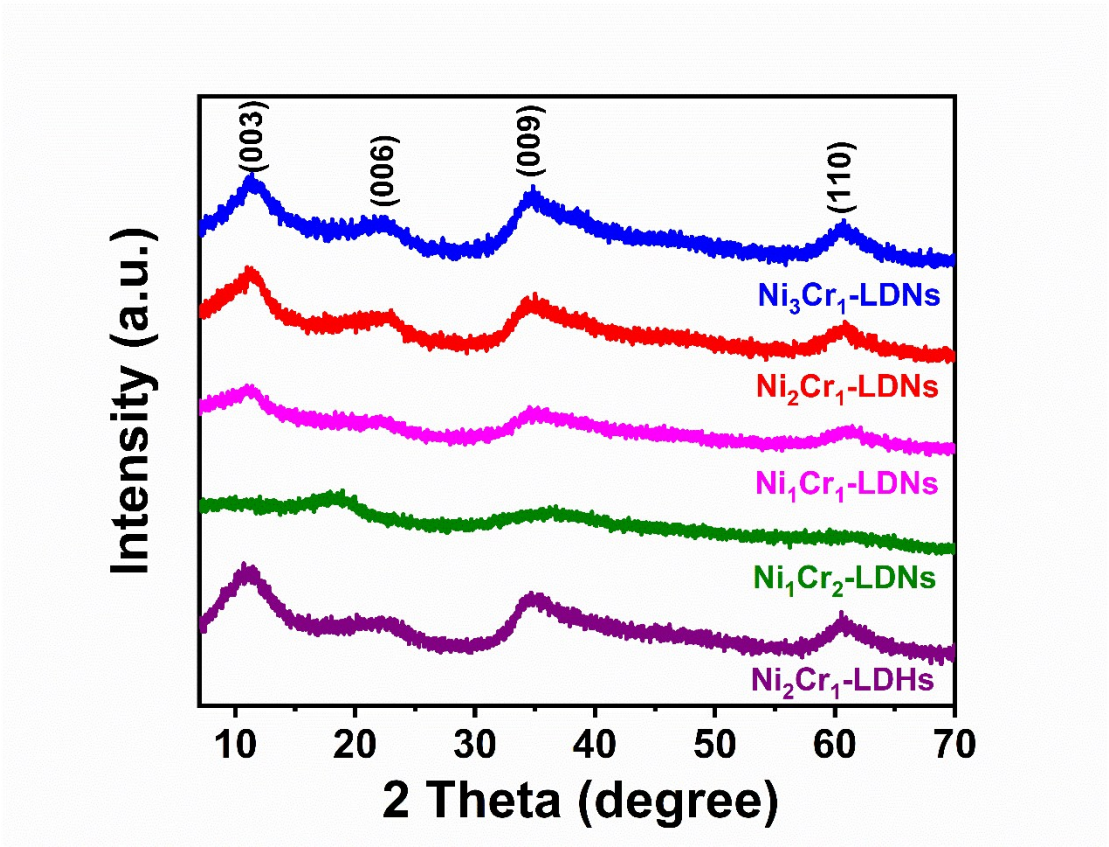

Fig. S1 XRD patterns of Ni_3Cr_1-LDNs, Ni_2Cr_1-LDNs, Ni_1Cr_1-LDNs, Ni_1Cr_2-LDNs and Ni_2Cr_1-LDHs.

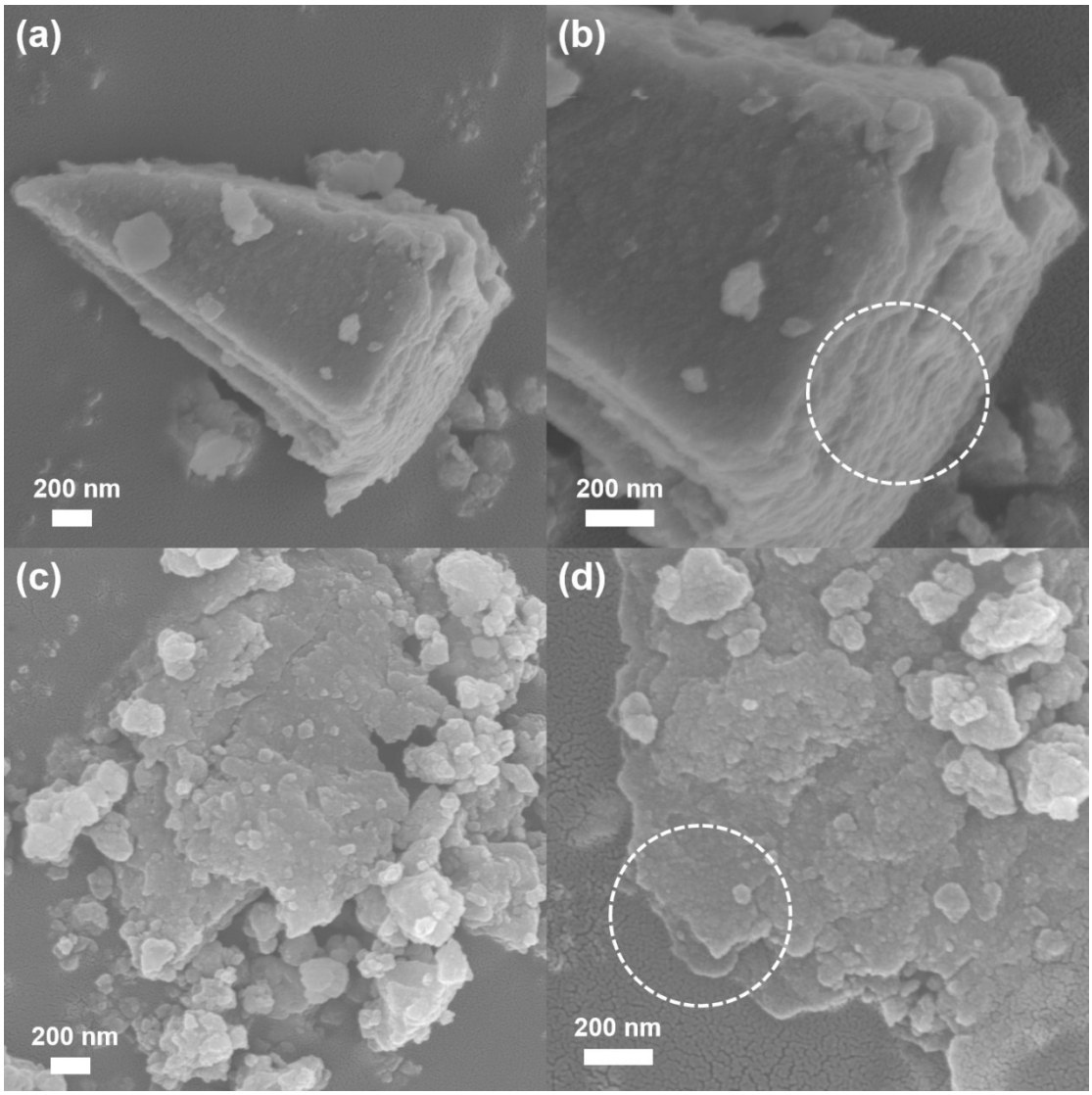

Fig. S2 SEM images of the synthesized Ni_2Cr_1-LDHs (a) and (b); Ni_2Cr_1-LDNs (c) and (d).

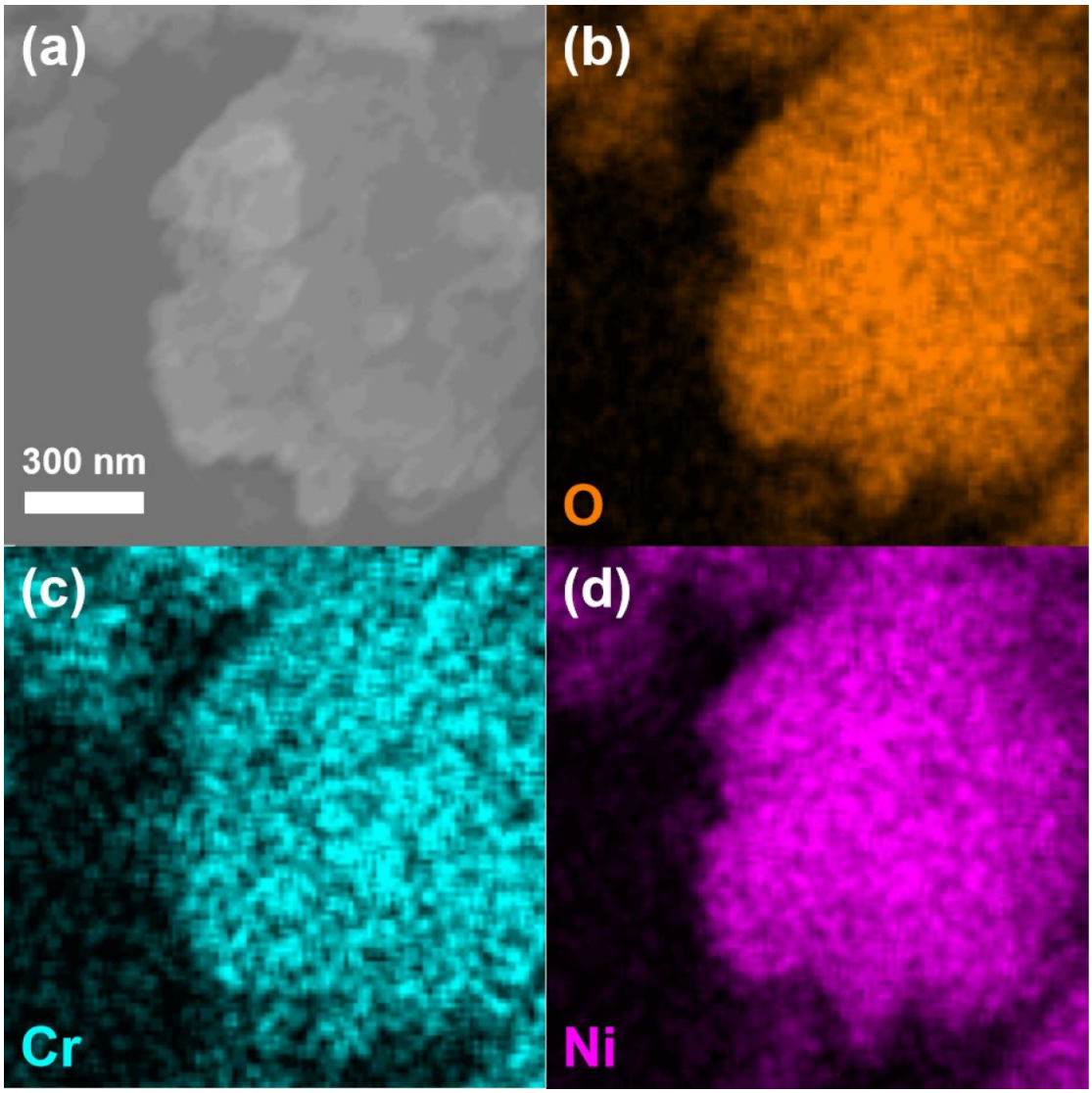

Fig. S3 SEM image of the Ni_2Cr_1-LDNs (a) and the corresponding EDS mapping of O (b), Cr (c) and Ni (d) elements.

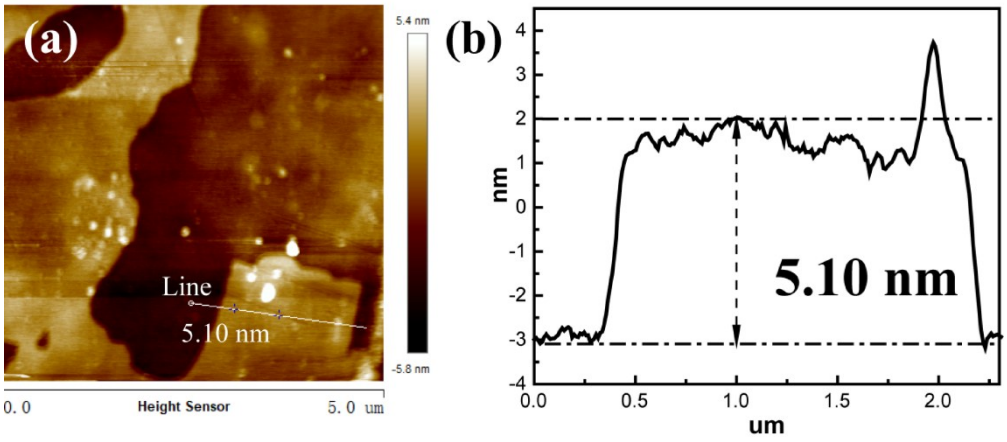

Fig. S4 (a) AFM image and (b) the corresponding height profile of Ni_2Cr_1-LDNs.

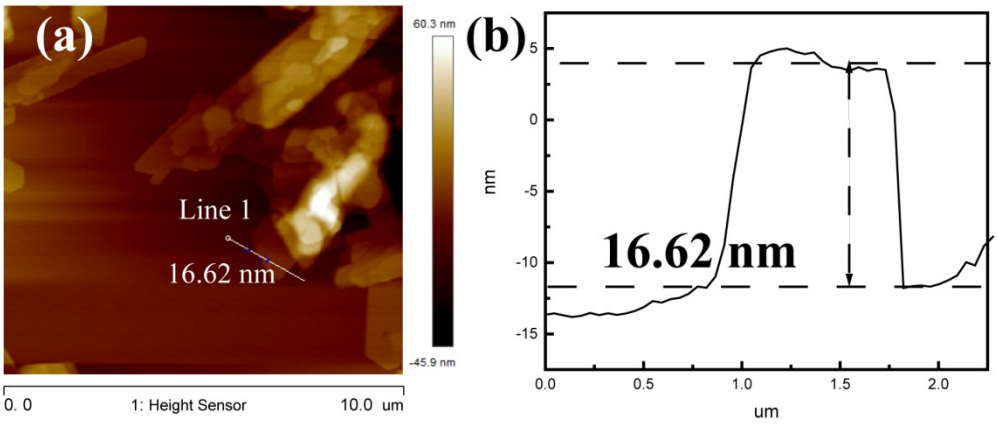

Fig. S5 (a) AFM image and (b) the corresponding height profile of Ni_1Cr_1-LDNs.

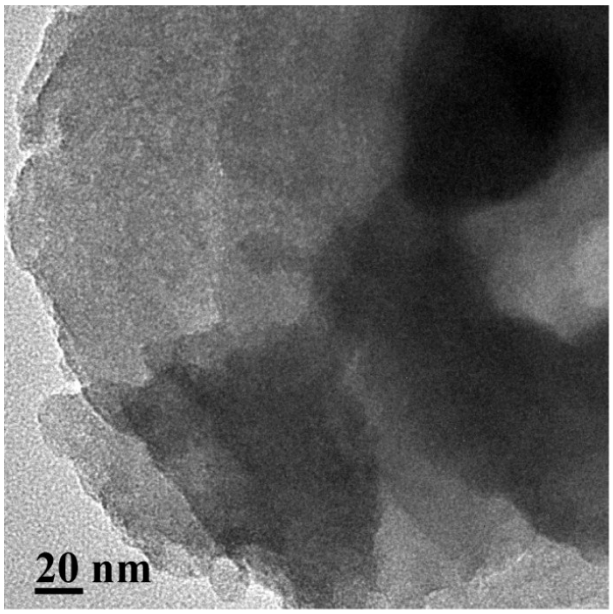

Fig. S6 Transmission Electron Microscopy image of Ni_1Cr_1-LDNs.

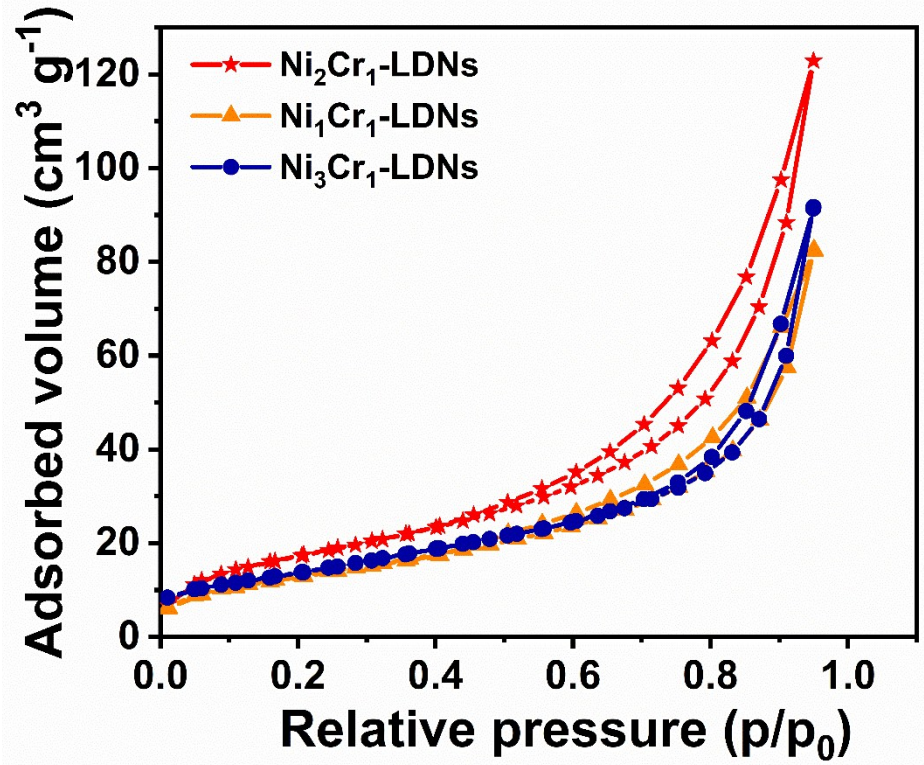

Fig. S7 N_2 adsorption/desorption isotherms of Ni_1Cr_1-LDNs, Ni_2Cr_1-LDNs and Ni_3Cr_1-LDNs.

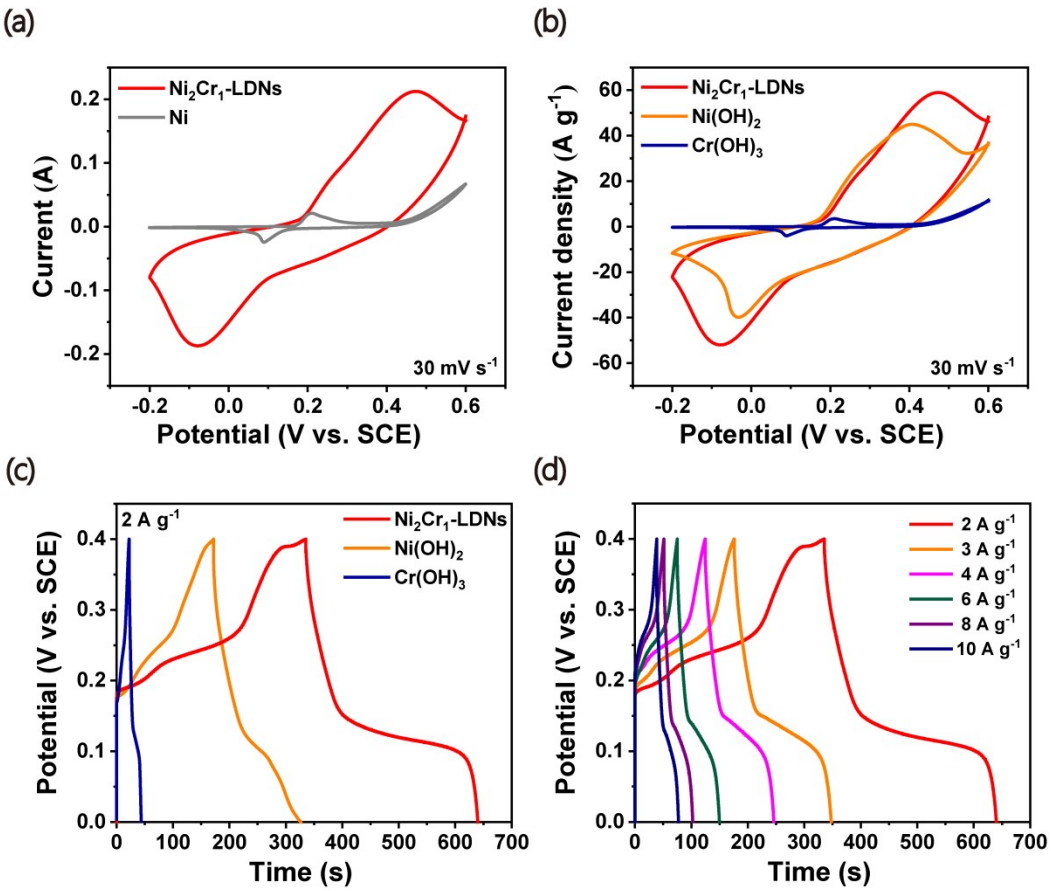

Fig. S8 (a) CV curves of Ni_2Cr_1-LDNs and pure nickel foam at the scan rate of 30 mV s^{-1} in 6 M KOH, (b) CV curves of Ni_2Cr_1-LDNs, $Ni(OH)_2$ and $Cr(OH)_3$ at the scan rate of 30 mV s^{-1} in 6 M KOH, (c) GCD curves of Ni_2Cr_1-LDNs, $Ni(OH)_2$ and $Cr(OH)_3$ at current densities of 2 A g^{-1}, (d) GCD curves of Ni_2Cr_1-LDNs at various current densities from 2 to 10 A g^{-1}.

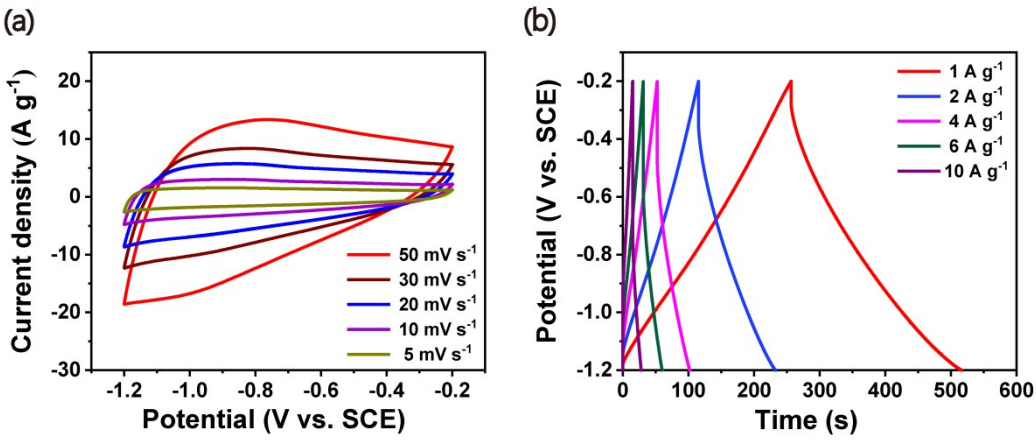

Fig. S9 (a) CV curves of AC at different scan rates from 5 to 50 mV s^{-1}, (b) GCD curves of AC at various current densities from 1 to 10 A g^{-1}.

For

$$\log k_s = a\log(1-a) + (1-a)\log a - \log\frac{RT}{nFv} - \frac{a(1-a)nF\Delta Ep}{2.303RT} \quad (5)$$

where the values of T, n, R, F and a is 298, 1, 8.314, 96500 and 0.42, respectively.