Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Information

Flower-like perovskite $LaCr_{0.9}Ni_{0.1}O_{3-\delta}$-NiO nanostructures: A new candidate for CO_2 reforming of methane

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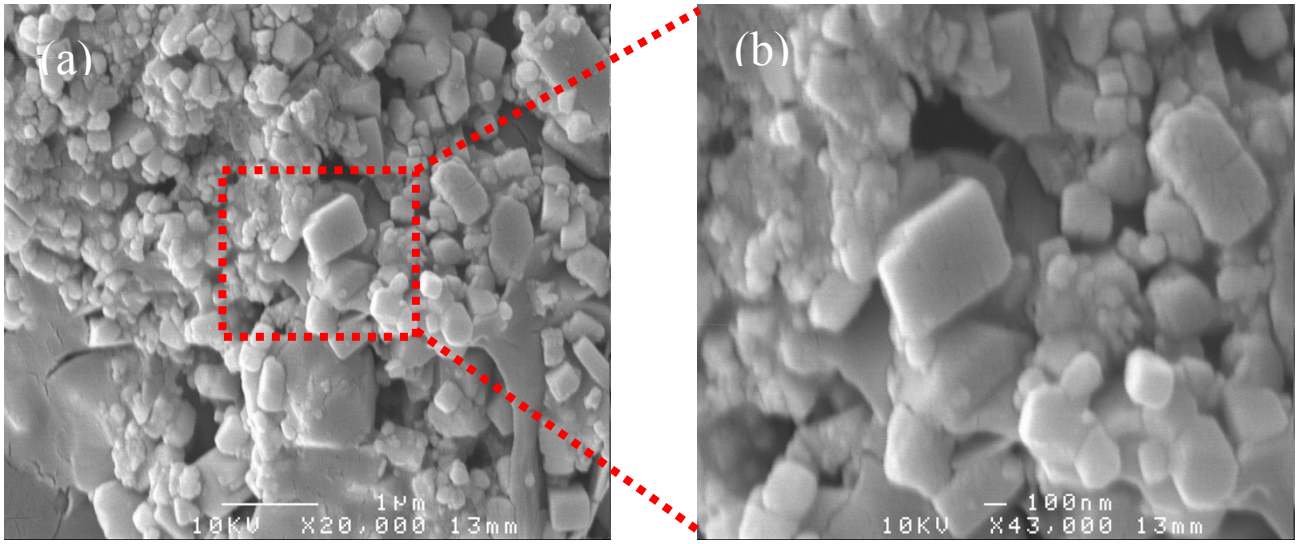
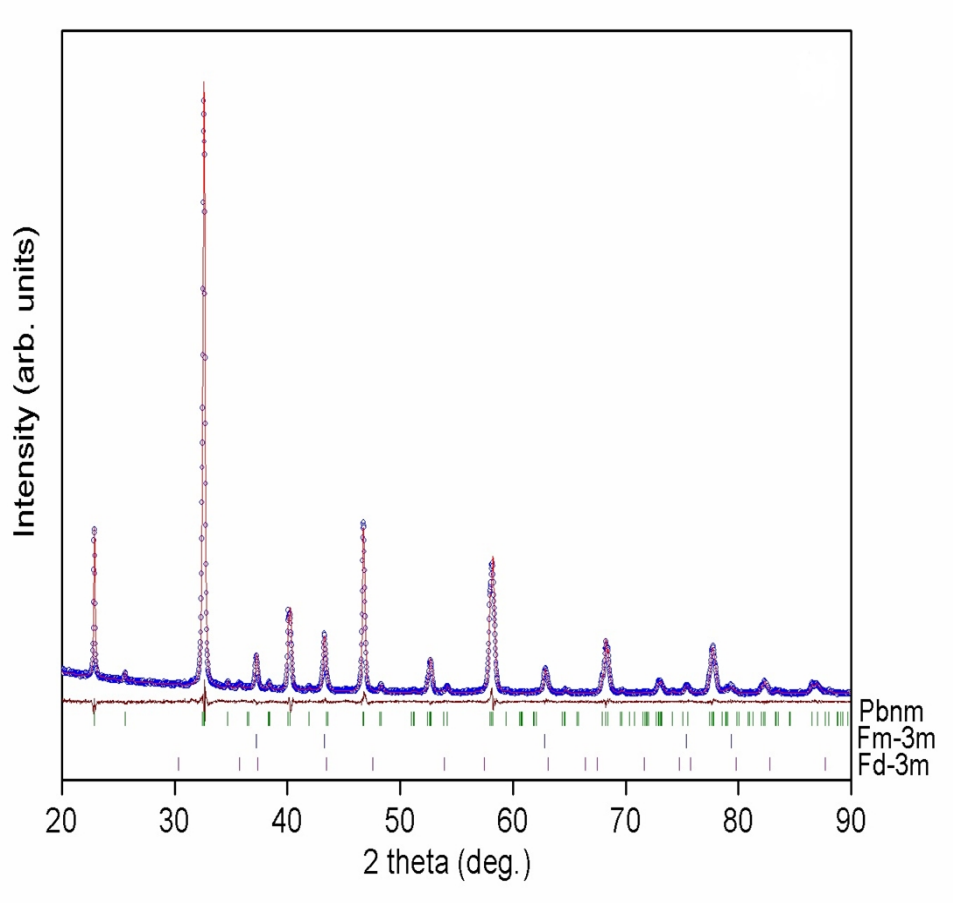


Figure S1 Low- and high-magnification FESEM micrographs of $LaCr_{0.9}Ni_{0.1}O_{3-\delta}$ in the absence of urea (C-LCN)



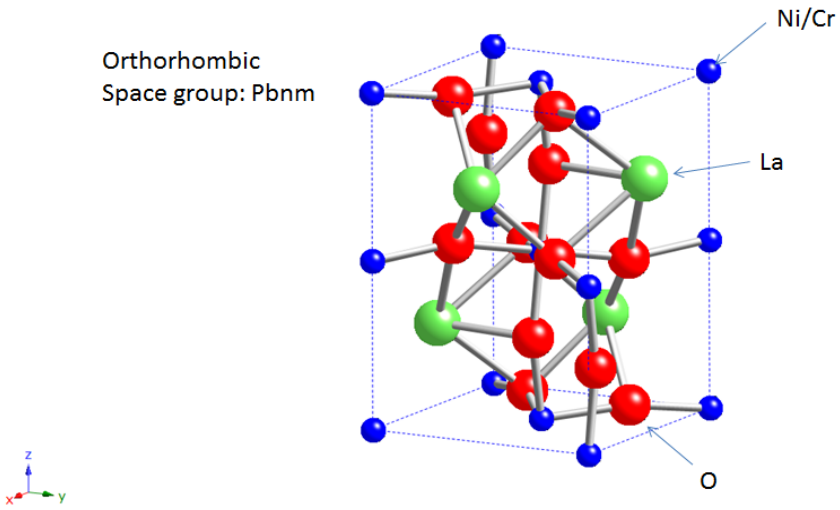


Figure S2 Structural analysis of $LaCr_{0.9}Ni_{0.1}O_{3-\delta}$ (LCN) nanowires (a) and schematic representation of the orthorhombic $LaCr_{1-x}Ni_xO_{3-\delta}$ (b) (Le Bail refined XRD pattern of $LaCr_{0.9}Ni_{0.1}O_{3-\delta}$ with experimental data (red dots), calculated profiles (blue line), difference curve (green line), and the calculated Bragg positions (vertical bar) for each phase.

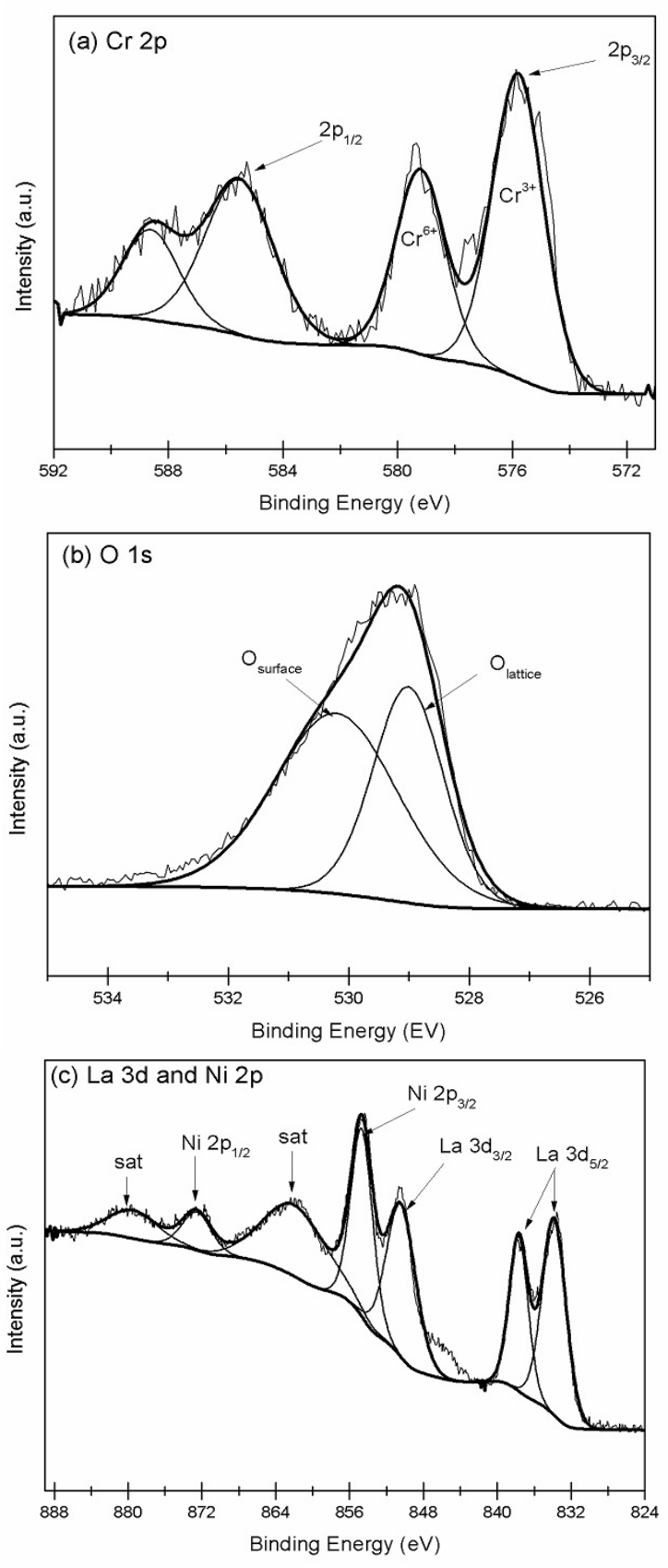


Figure S3 XPS spectra: (a) Cr 2p, (b) O 1s, and (c) La 3d and Ni 2p regions of $LaCr_{0.9}Ni_{0.1}O_{3-\delta}$ (LCN) nanowires.

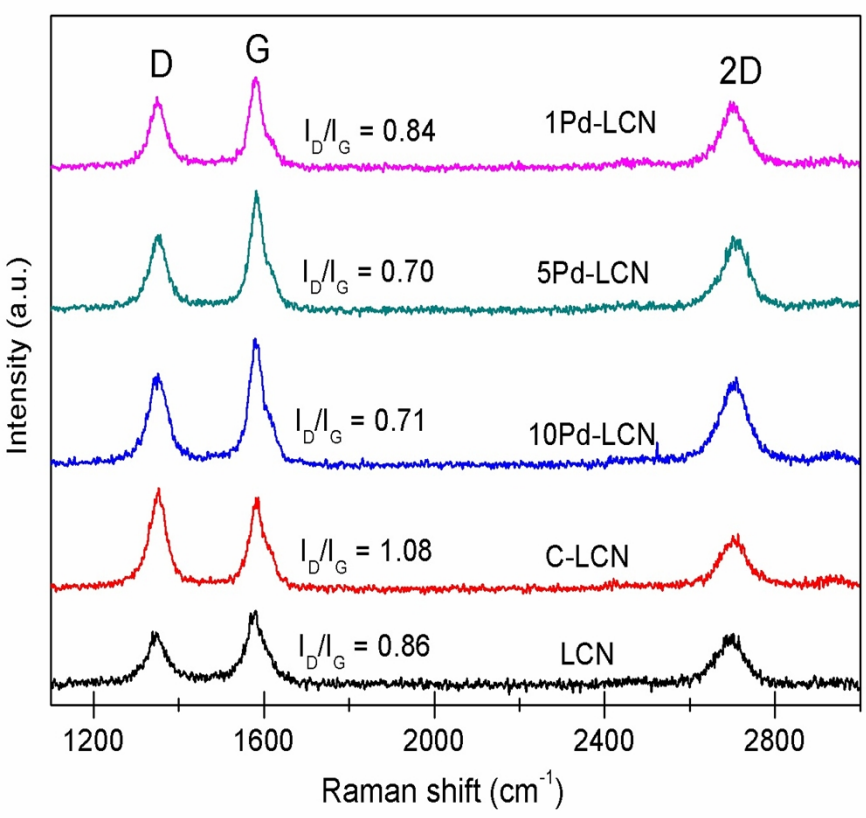


Figure S4 Raman spectra of carbonaceous materials on LCN, C-LCN, 1Pd-LCN, 5Pd-LCN and 10Pd-LCN.

Table S1. Refined structural parameters of $LaCr_{1-x}Ni_xO_3$ (LCN) nanowires

Parameter	1st phase (Major) $LaCr_{0.9}Ni_{0.1}O_3$	2nd phase NiO	3rd phase $NiCr_2O_4$
Fraction (%)	76.52	20.15	3.33
a (Å)	5.5185 (4)	4.1815 (2)	8.3354 (4)
b (Å)	5.4817 (3)	-	-
c (Å)	7.7665 (1)	-	-
crystal structure	orthorhombic	cubic	cubic
Space group	Pbnm	Fm-3m	Fd-3m

$\chi^2 = 1.32$, $R_p = 3.51$ and $R_{wp} = 4.47$.

Table S2. XPS surface compositions of 1Pd-LCN, 5Pd-LCN and 10Pd-LCN.

Sample	Surface composition (at. %)						
	C1s	O1s	N1s	La3d	Cr2p	Pd3d	Ni2p
1Pd-LCN	28.50	55.07	3.97	3.44	3.05	0.15	5.83
5Pd-LCN	22.48	58.88	3.12	4.47	3.37	1.38	6.30
10Pd-LCN	25.12	59.39	-	4.42	2.83	2.20	6.03