Supplementary Materials

Characterization and Syngas Production at Low Temperature via Dry Reforming of Methane over Ni-M (M = Fe, Cr) Catalysts Tailored from LDH Structure

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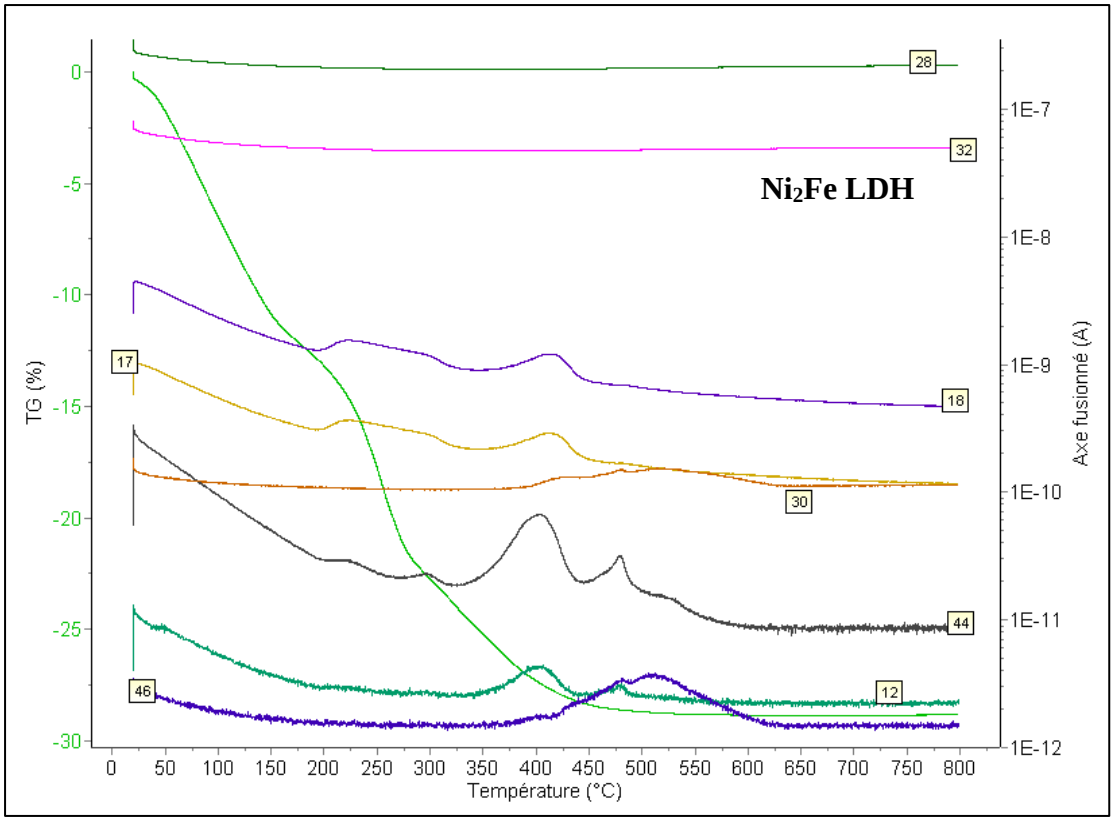

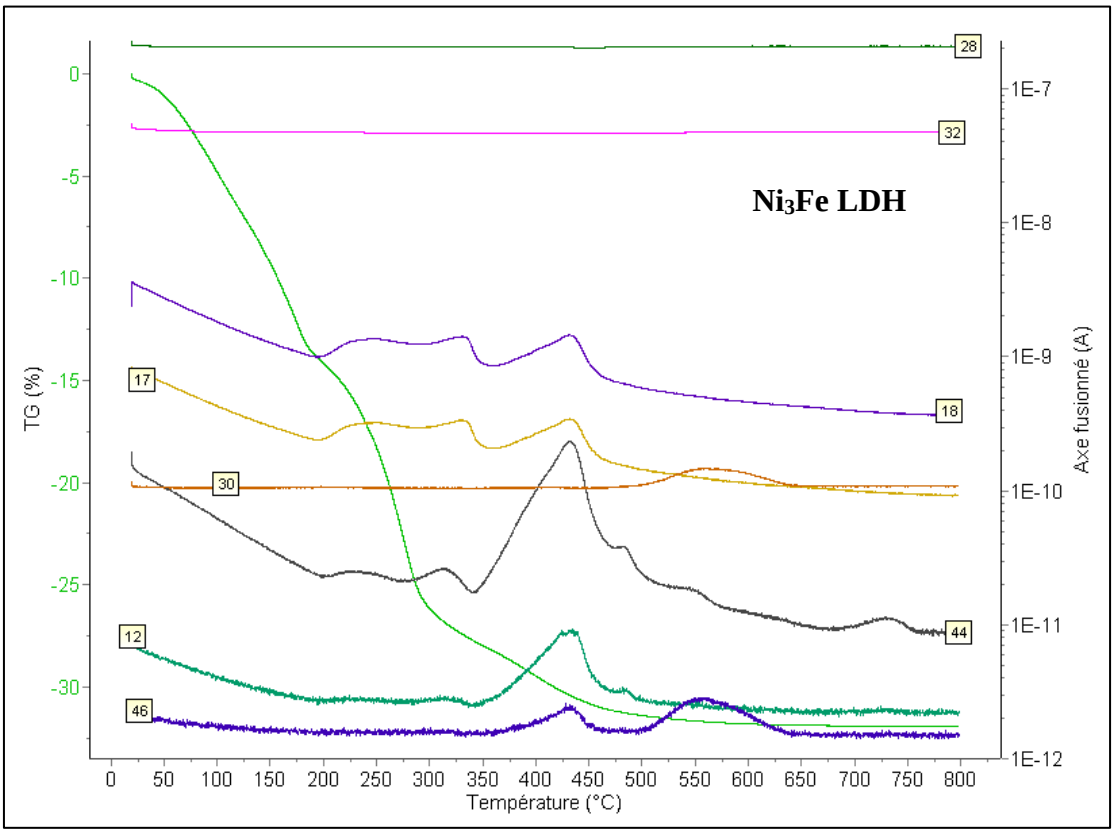

Figure S1. TG-MS curves of Ni_2Fe and Ni_3Fe LDH precursors performed in air atmosphere.

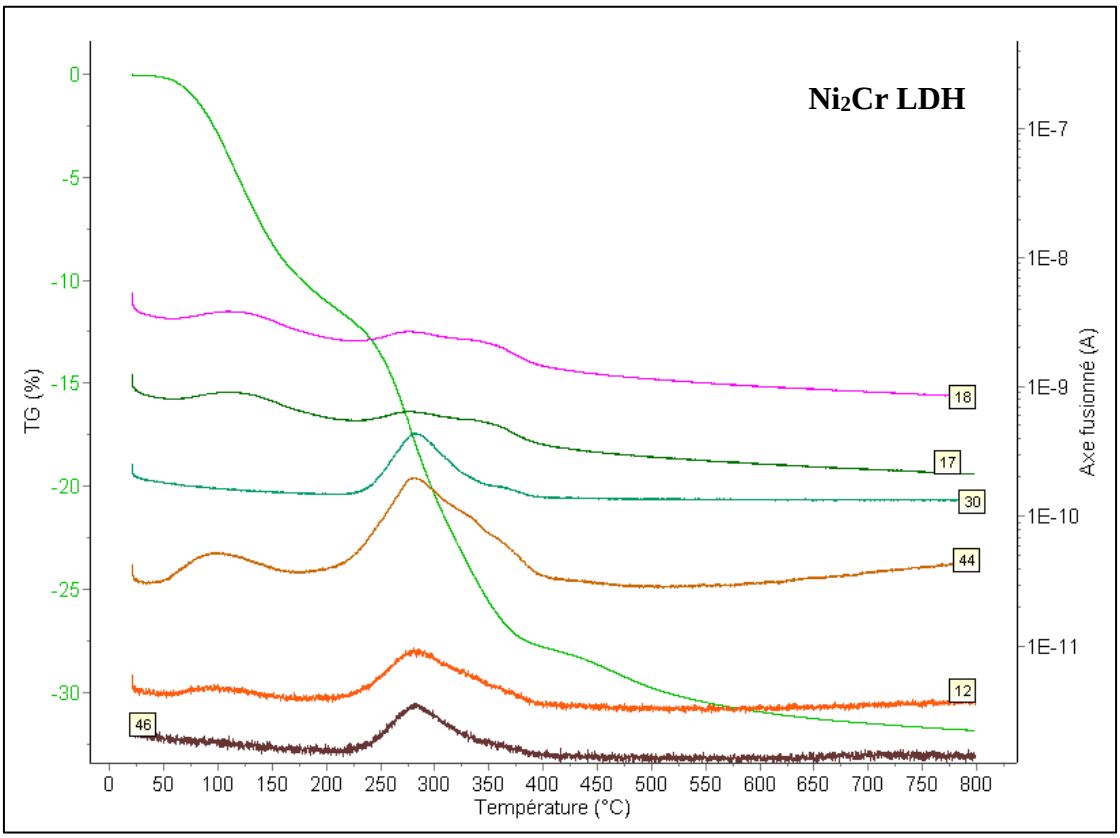

Figure S2. TG-MS curves of Ni_2Cr LDH precursor performed in air atmosphere.

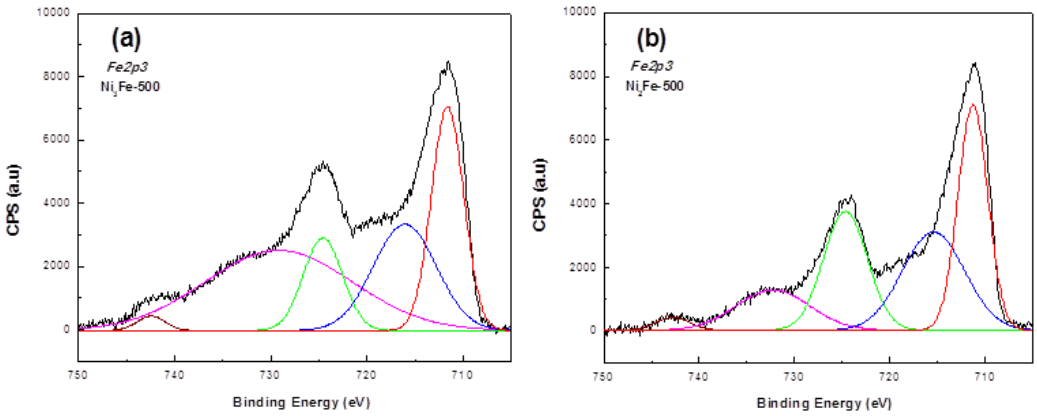

Figure S3. XPS spectra of Fe2*p*3/2 species of (**a**) Ni3Fe-500 and (**b**) Ni2Fe-500.

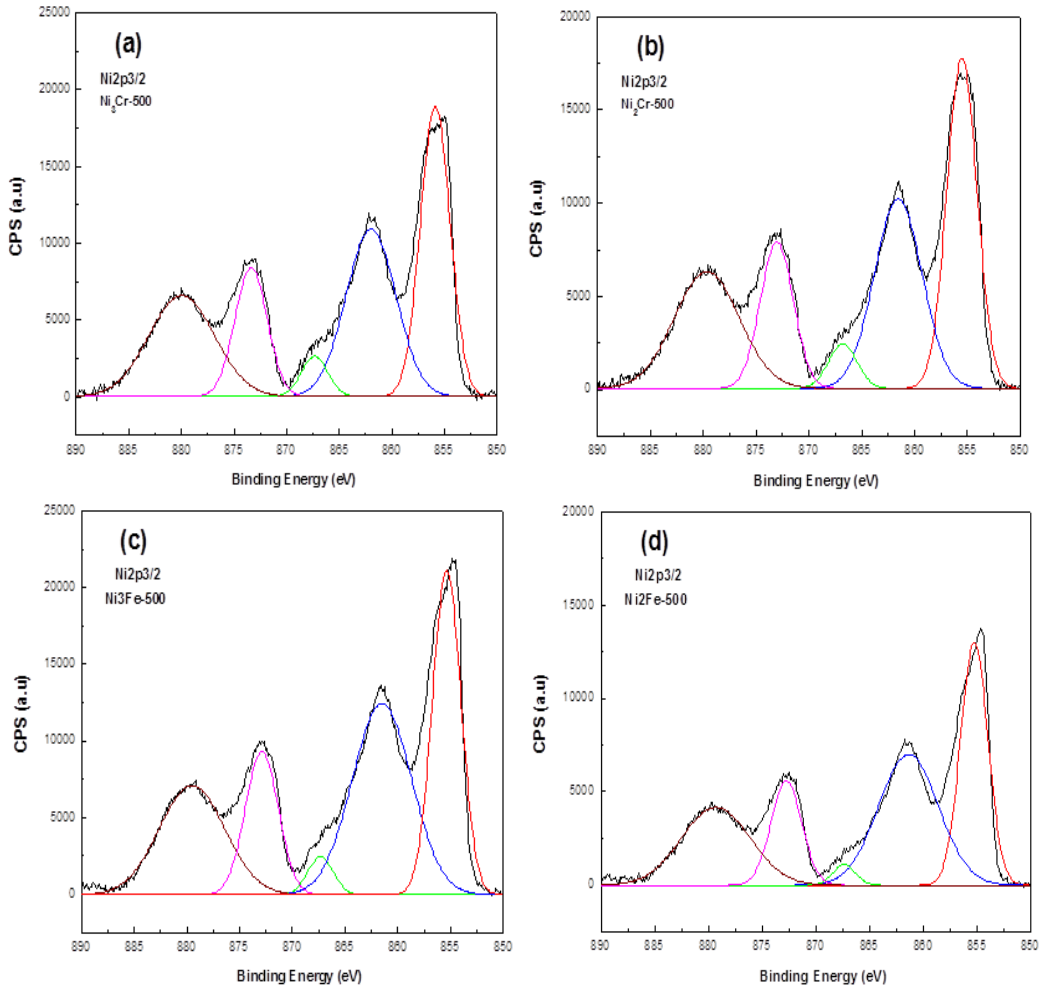

Figure S4. XPS spectra of Ni2*p*3/2 species of (**a**) Ni3Cr-500, (**b**) Ni2Cr-500, (**c**) Ni3Fe-500 and (**d**) Ni2Fe-500.

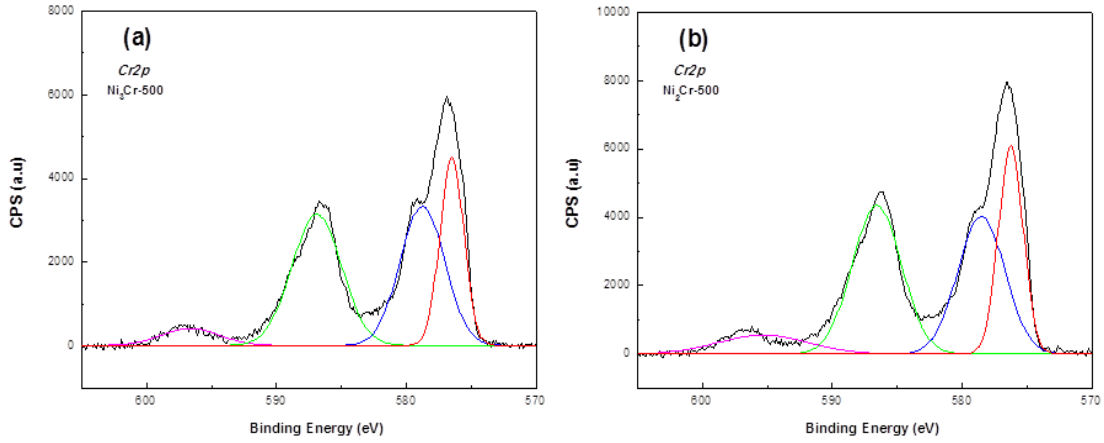

Figure S5. XPS spectra of Cr2*p* species of (**a**) Ni_3Cr-500 and (**b**) Ni_2Cr-500.

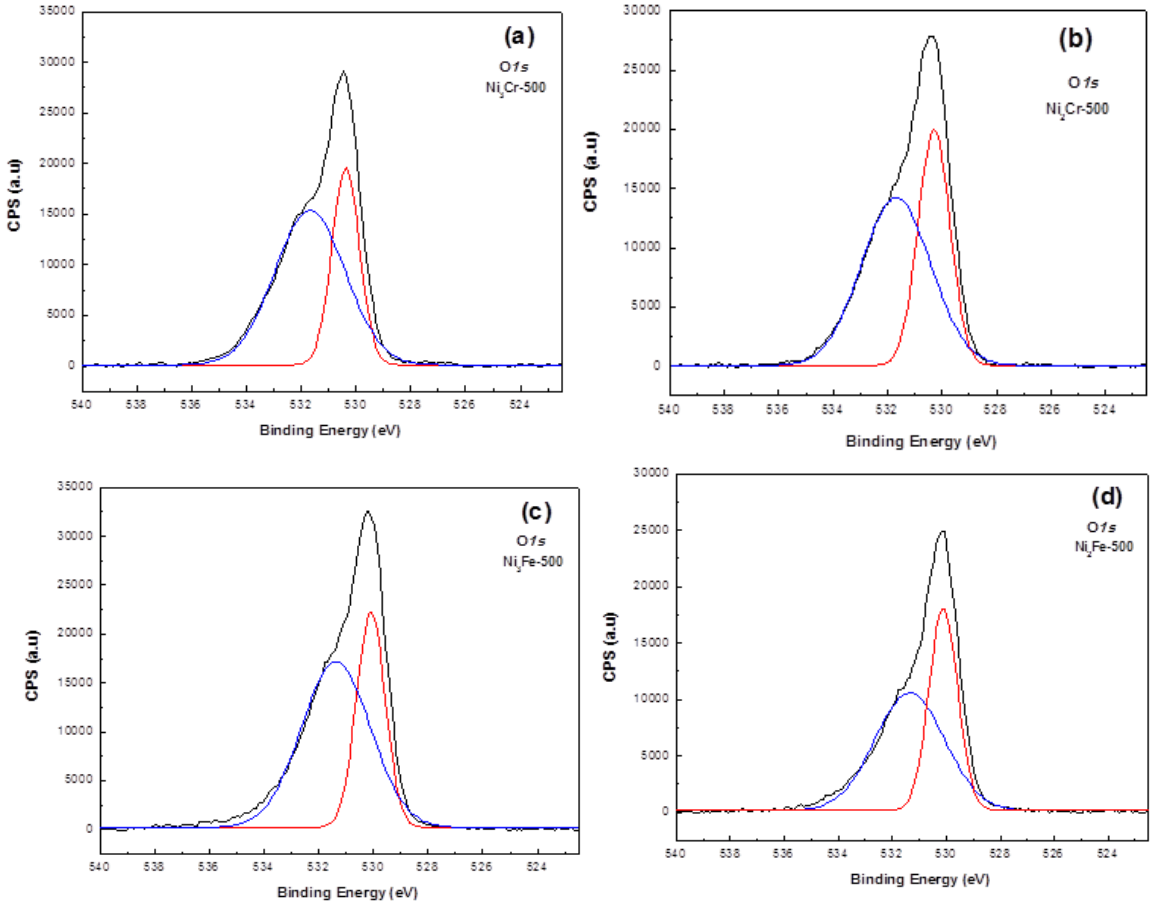

Figure S6. XPS spectra of O1*s* species of (**a**) Ni_3Cr-500, (**b**) Ni_2Cr-500, (**c**) Ni_3Fe-500 and (**d**) Ni_2Fe-500.

Table S1. TGA-MS of NiRFe and NiRCr LDH precursors.

LDH	Domain of T° (°C)	Species releazed	% of lost mass	% total lost mass	% total theoretical lost mass
R=2 $[Ni_{0.66}Fe_{0.33}(OH)_2]\ (CO_3)_{0.165}$	30 -150 150-281 281 -474	H_2O H_2O,NO, CO_2, NO_2 NO,CO_2 NO_2	6.02 10.97 7.02	24,01	24,99
R=3 $[Ni_{0.75}Fe_{0.25}(OH)_2]\ (CO_3)_{0.125}$	30 -16 164-290 290 -480	H_2O H_2O,NO, CO_2 NO_2 NO,CO_2 NO_2	9,25 12,75 5,44	27,44	23,34
R=2 $[Ni_{0.66}Cr_{0.33}(OH)_2]\ (CO_3)_{0.165}$	53-156 156-345 345 -570	H_2O H_2O,NO, CO_2 NO_2 NO,CO_2 NO_2	9,37 18,62 3,74	31,73	25,3
R=3 $[Ni_{0.75}Cr_{0.25}(OH)_2]\ (CO_3)_{0.125}$	51 -159 159-352 352 -580	H_2O H_2O,NO, CO_2 NO_2 NO,CO_2 NO_2	9,17 18,62 3,74	31,53	23,85

Table S2. Catalytic performances in DRM, temperature programmed mode

Catalysts	**T (°C)**	**X% CH_4**	**X% CO_2**	**S% H_2**	**H_2/CO**
Ni_2Cr-500	400	0	0	0	0
	450	0	0	0	0
	500	16	18	59	0.6
	550	37	36	75	0.9
	600	63	48	73	1.2
	650	46	28	55	1.3
Ni_3Cr-500	400	1	1	0	0
	450	4	4	36	0.3
	500	23	22	68	0.7
	550	40	29	70	1.1
	600	47	30	52	1.8
	650	70	27	25	0.9
Ni_2Fe-500	400	3	1	2	0
	450	3	1	2	0
	500	4	1	2	0
	550	7	1	2	0
	600	8	1	5	0.4
	650	6	1	8	0.5
Ni_3Fe-500	400	2	1	1	0
	450	2	1	1	0
	500	3	1	1	0.5
	550	3	1	7	0.6
	600	5	1	6	0.7
	650	7	2	4	0.3