Electronic Supplementary Material (ESI) for CrystEngComm.

Electronic Supporting Information

Modulating the active phase in perovskite LaCoO3 with B-site doping of Cu for efficient methanol reforming to produce hydrogen

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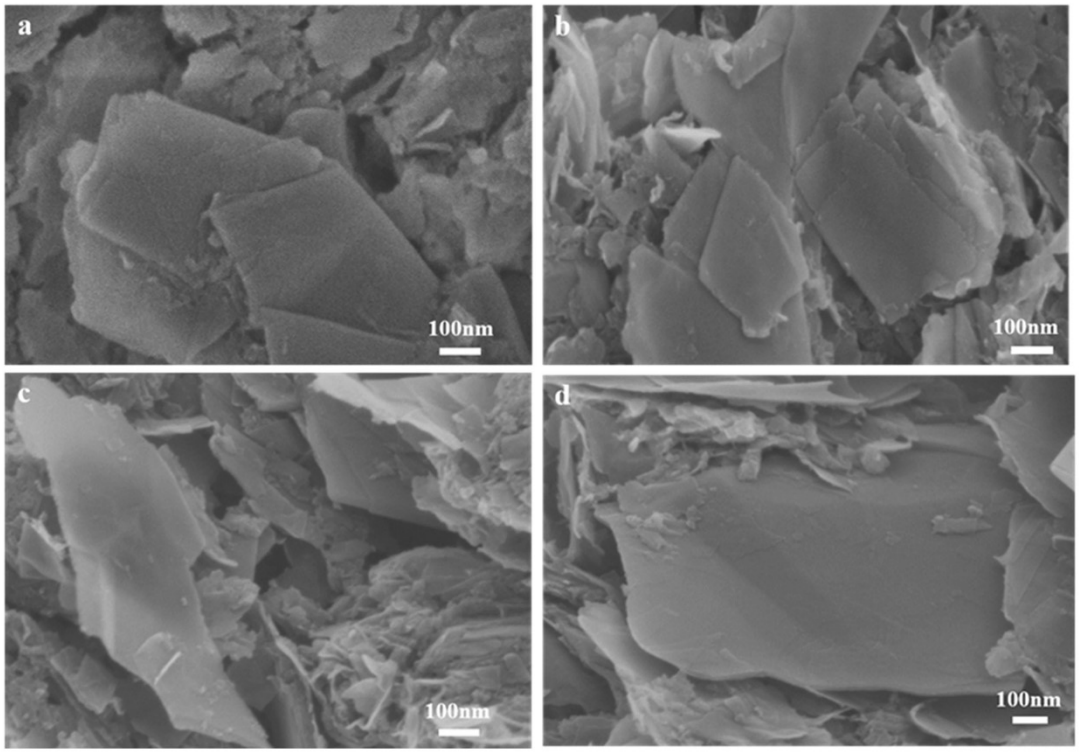

Fig.S1 SEM images of (a)$LaCoO_3$ (b)$LaCo_{0.97}Cu_{0.03}O_3$ (c)$LaCo_{0.94}Cu_{0.06}O_3$ (d)$LaCo_{0.88}Cu_{0.12}O_3$

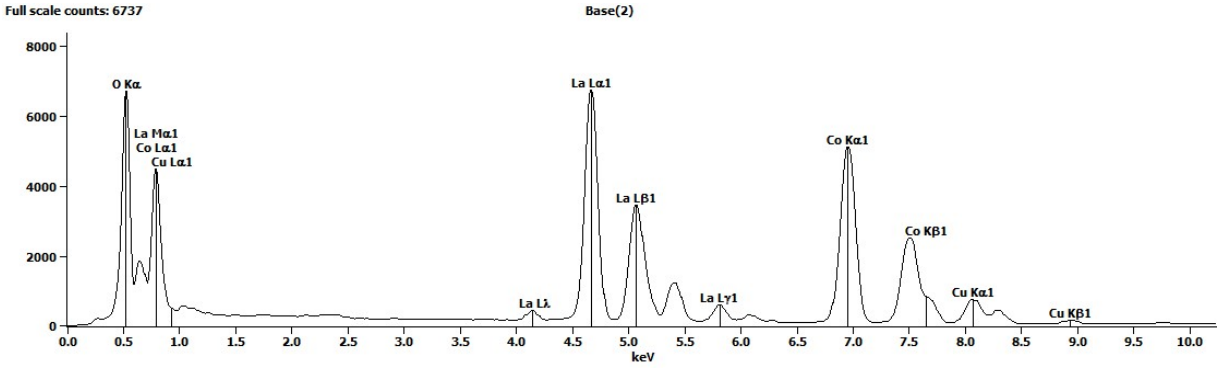

Fig.S2 EDS spectral analysis of $LaCo_{0.97}Cu_{0.03}O_3$-300 catalyst.

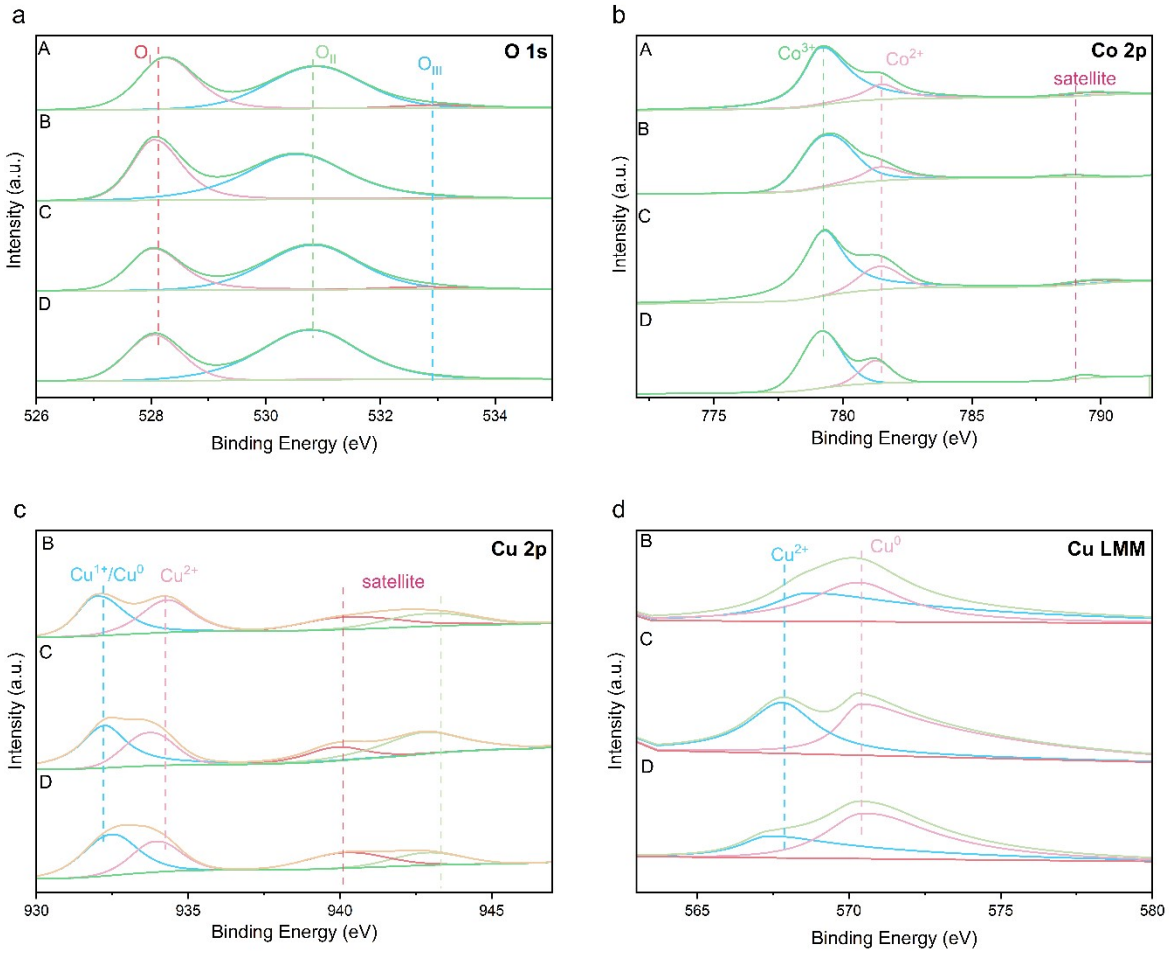

Fig.S3 (a) O 1s, (b) Co 2p, (c) Cu 2p, and (d)Cu LMM XPS spectra of $LaCo_{1-x}Cu_xO_3$-300 catalysts (A: x=0, B: x=0.03, C:x=0.06, D:x=0.12).

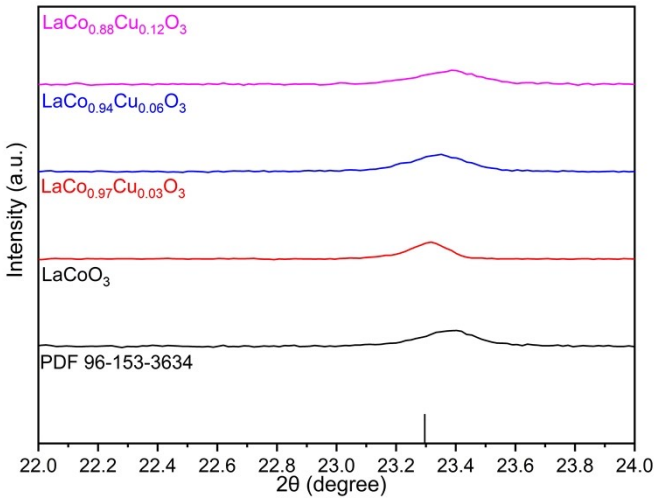

Fig.S4 XRD pattern of $LaCo_{1-x}Cu_xO_3$ catalysts.

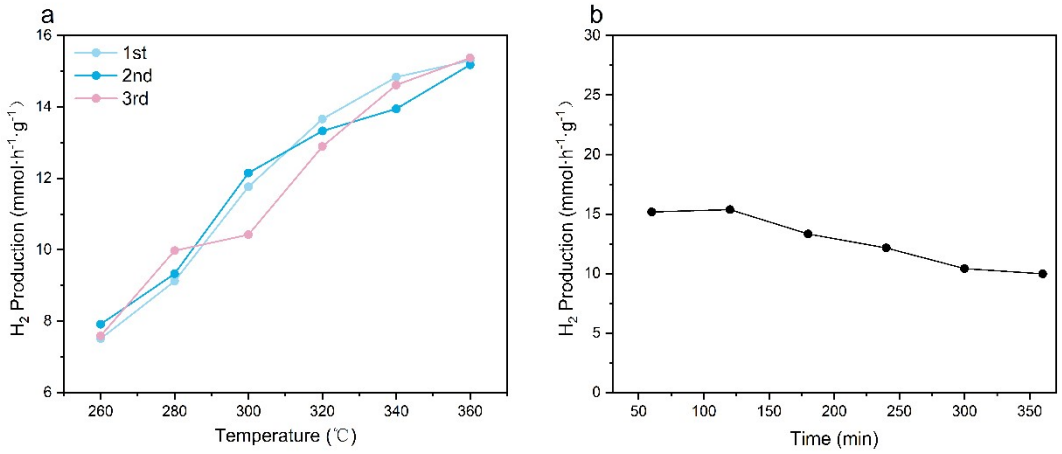

Fig.S5 The stability and cyclicity experiments of $LaCo_{0.97}Cu_{0.03}O_3$-300 catalysts.

Table S1 EDS results of $LaCo_{0.97}Cu_{0.03}O_3$-300

Element Line	*Weight %*	*Weight % Error*	*Norm. Wt.%*	*Norm. Wt.% Err*	*Atom %*	*Atom % Error*
O K	15.10	± 0.13	15.10	± 0.13	53.26	± 0.45
Co K	20.71	± 0.13	20.71	± 0.13	19.83	± 0.12
Cu K	1.74	± 0.11	1.74	± 0.11	1.54	± 0.10
La L	62.45	± 0.31	62.45	± 0.31	25.37	± 0.13
Total	100.00		100.00		100.00	

Table S2 Chemical state distribution of elements on catalyst surface (Atomic %)

Samples	Cu		O			Co	
	Cu^{1+} (%)	Cu^{2+} (%)	O_I (%)	O_{II} (%)	O_{III} (%)	Co^{3+} (%)	Co^{2+} (%)
$LaCoO_3$-300	--	--	43.29	53.06	3.66	82.02	17.98
$LaCo_{0.97}Cu_{0.03}O_3$-300	36.59	63.41	40.2	59.11	0.69	79.64	20.36
$LaCo_{0.94}Cu_{0.06}O_3$-300	39.18	60.82	38.1	59.24	2.65	78.97	21.03
$LaCo_{0.88}Cu_{0.12}O_3$-300	59.41	40.59	35.76	64.07	0.16	77.14	22.86