Supporting Information for

Co-N-C catalyst modified by alkaline additive for hydrogenation

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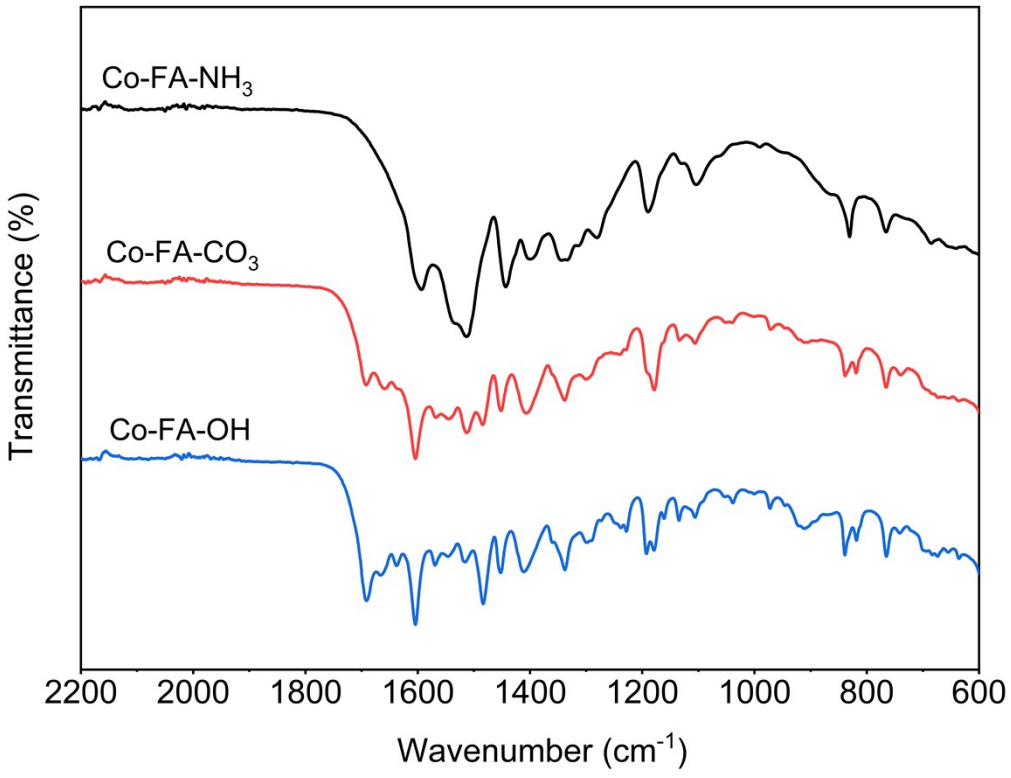

Figure S1. FT-IR spectra of the catalyst precursors

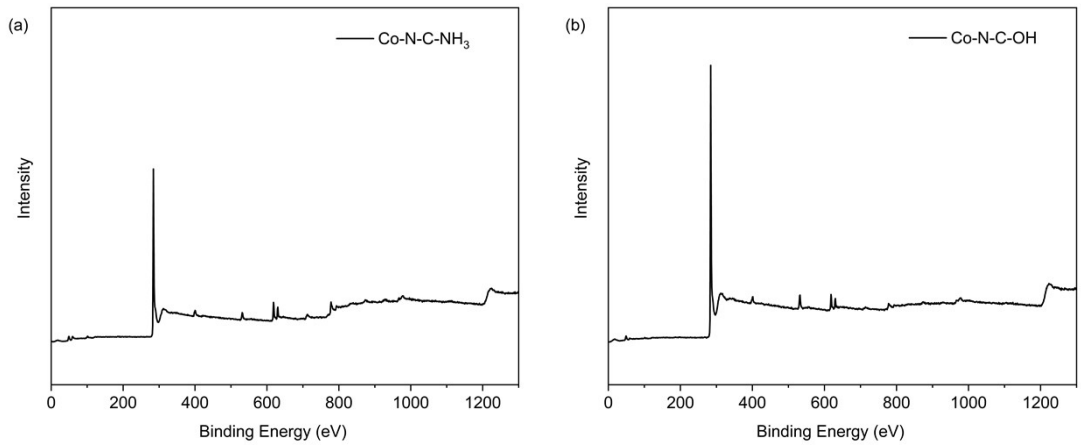

Figure S2 Full XPS spectrum of (a) Co-N-C-NH_3 and (b) Co-N-C-OH

Table S1. Content of different N doping modes according to XPS

catalyst	Co-N_x (%)	Pyridinic N (%)	Pyrrolic N (%)	Graphitic N (%)	NO_x (%)
Co-N-C-NH_3	7.55	31.97	21.98	15.19	23.30
Co-N-C-CO_3	18.12	11.55	27.46	41.79	1.07
Co-N-C-OH	8.62	17.89	6.47	38.17	28.84

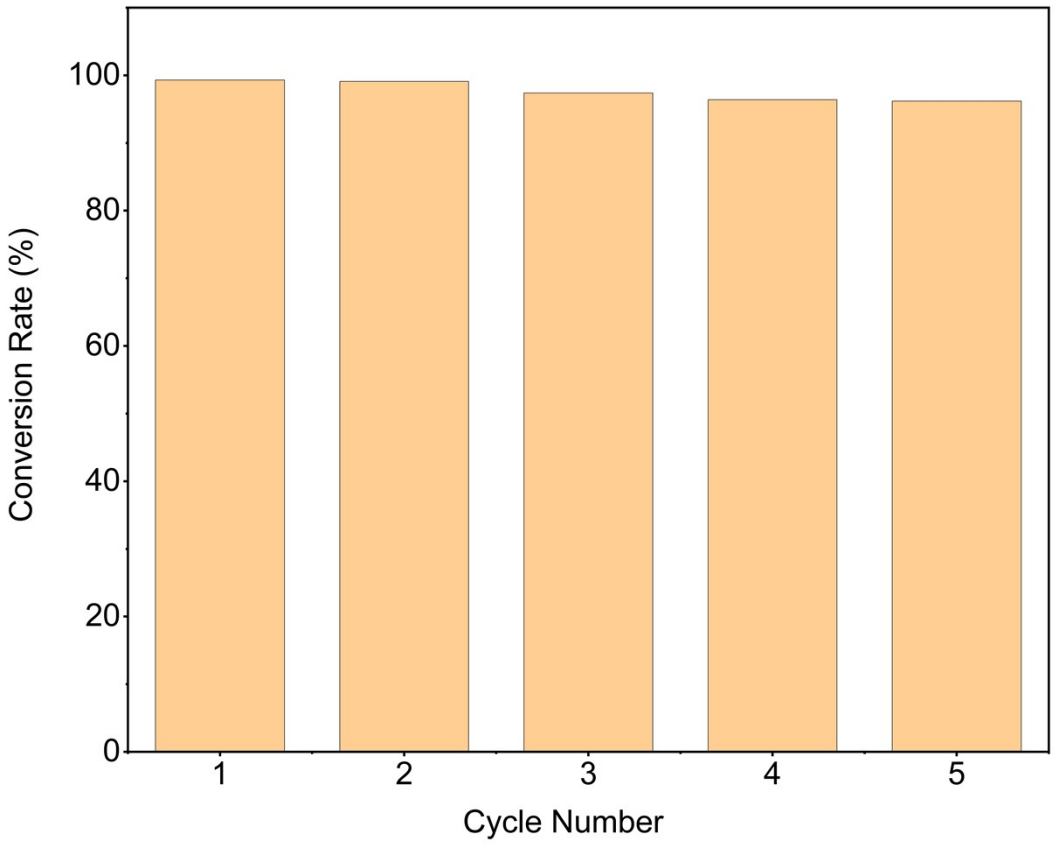

Figure S3. Co-N-C-CO_3 cycle application experiment