

Supporting Information

Synthesis of efficient Co and N-co-doped carbon catalysts with high surface areas for selective oxidation of ethylbenzene

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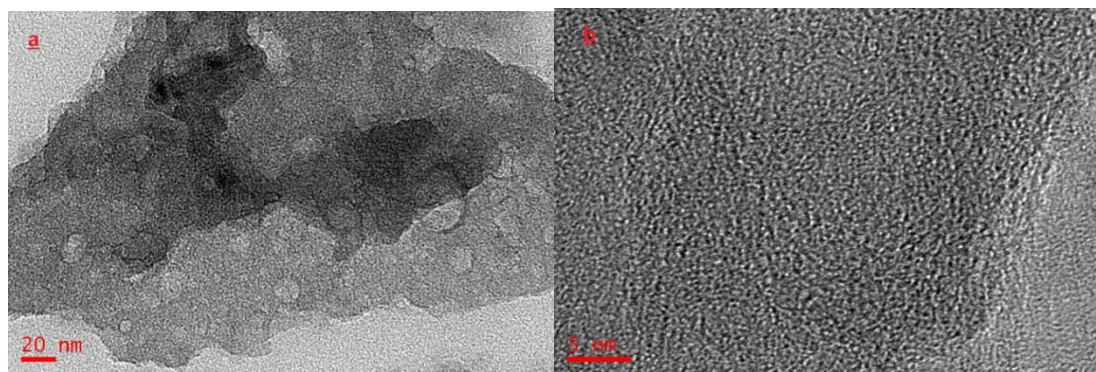


Fig. S1 TEM image of p-Co-N-C-700H-r4 (a), and HRTEM images of p-Co-N-C-700H-r4 (b)

The TEM and HRTEM images of p-Co-N-C-700H-r4 revealed the structure of the catalyst without obvious change after the reaction. Moreover, a great deal of mesoporous structure was still remained. However, compared with p-Co-N-C-700H, the size of metal nanoparticles was smaller.

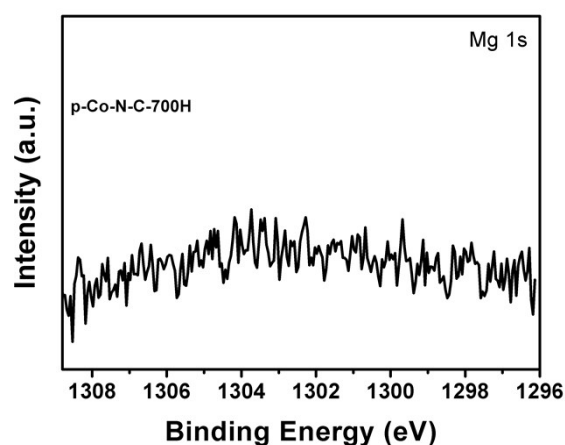


Fig. S2 The high-resolution Mg 1s XPS spectrum of p-Co-N-C-700H.

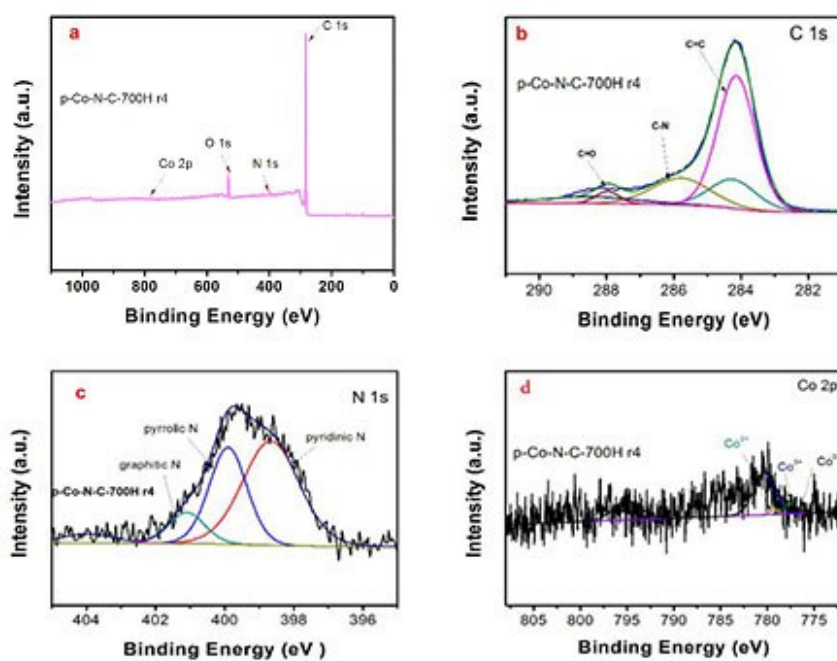


Fig. S3 XPS patterns of p-Co-N-C-700H-r4; a) high-resolution C1s XPS spectrum, b) high-resolution O1s XPS spectrum; c) high-resolution N1s XPS spectrum; d) high-resolution Co2p XPS spectrum

Table S1 The ratio analysis of the peaks in XPS spectra of the p-Co-N-C-700H-r4.

| Element content | p-Co-N-C-700H-r4 |
|--|------------------|
| C (at%) | 80.59 |
| O (at%) | 14.78 |
| Co (at%) | 0.28 |
| Co ³⁺ /Co ²⁺ (%) | 0.31 |
| N (at%) total | 4.34 |
| Pyridinic N (%) | 60.33 |
| Pyrrolic N (%) | 26.29 |
| Graphitic N (%) | 13.38 |

Table S2 The ratio analysis of N, Co, and Mg based on elemental analyses and ICP-AES.

| Element content | p-Co-N-C-700 | p-Co-N-C-700H |
|-----------------|--------------|---------------|
| N (wt%) | 0.8 | 5.7 |
| Co (wt%) | 6.2 | 1.0 |
| Mg (wt%) | 21.8 | 0.2 |