

Supplementary Information

Co supported catalysts on nitrogen and sulfur co-doped vertically-aligned carbon nanotubes for oxygen reduction reaction Yunmei Liu ^a,

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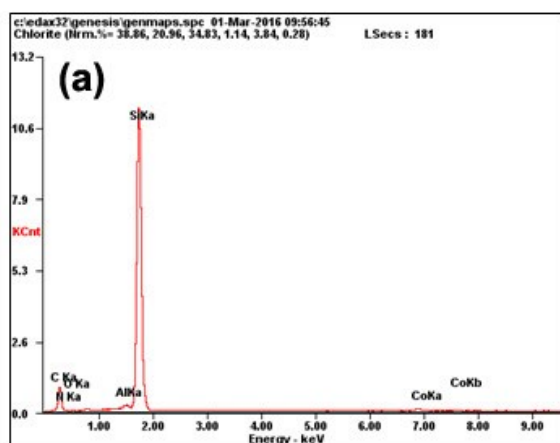
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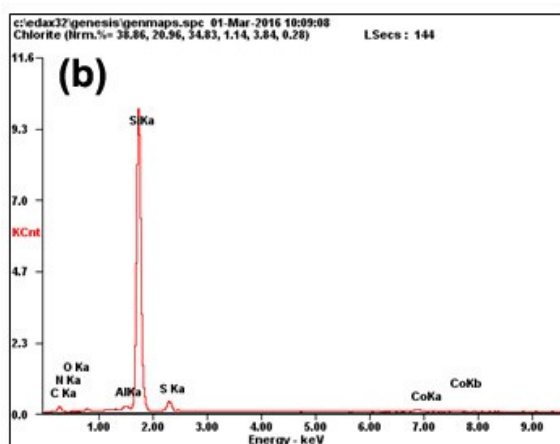
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Fig. S1 EDS spectra and relative element contents for the various catalysts: (a) as-sputtered, (b) Co/NS-CNT-400, (c) Co/NS-CNT-600 and (d) Co/NS-CNT-800.

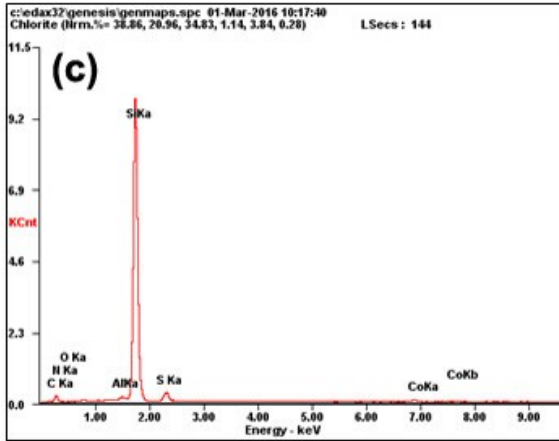
When comparing the element contents among different catalysts, Si and Al were neglected and the relative contents were re-calculated by only considering the elements of C, N, O, Co and S.



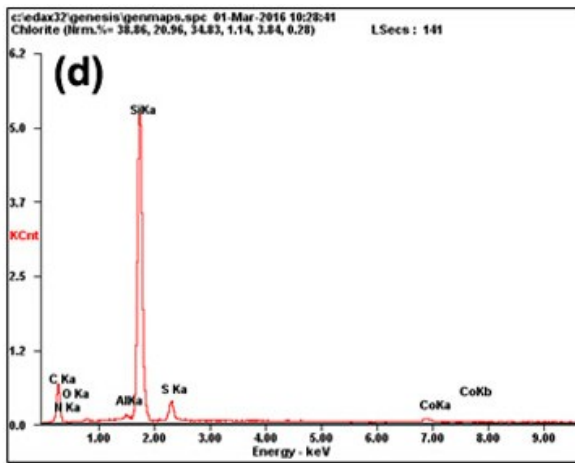
Element [⊖]	Wt% [⊖]	At% [⊖]
CK [⊖]	48.93 [⊖]	68.69 [⊖]
NK [⊖]	01.29 [⊖]	01.55 [⊖]
OK [⊖]	00.65 [⊖]	00.69 [⊖]
AlK [⊖]	00.74 [⊖]	00.47 [⊖]
SiK [⊖]	46.97 [⊖]	28.20 [⊖]
CoK [⊖]	01.41 [⊖]	00.40 [⊖]
Matrix [⊖]	Correction [⊖]	ZAF [⊖]



Element [⊖]	Wt% [⊖]	At% [⊖]
CK [⊖]	25.25 [⊖]	44.30 [⊖]
NK [⊖]	00.97 [⊖]	01.47 [⊖]
OK [⊖]	00.54 [⊖]	00.40 [⊖]
AlK [⊖]	00.95 [⊖]	00.74 [⊖]
SiK [⊖]	65.63 [⊖]	49.25 [⊖]
SK [⊖]	04.89 [⊖]	03.21 [⊖]
CoK [⊖]	01.77 [⊖]	00.63 [⊖]
Matrix [⊖]	Correction [⊖]	ZAF [⊖]



Element	Wt%	At%
CK	26.44	45.62
NK	01.27	01.88
OK	00.21	00.28
AlK	00.87	00.67
SiK	65.21	48.12
SK	04.53	02.93
CoK	01.47	00.52
Matrix	Correction	ZAF



Element	Wt%	At%
CK	55.43	74.14
NK	01.66	01.91
OK	00.33	00.33
AlK	00.65	00.39
SiK	36.68	20.98
SK	03.65	01.83
CoK	01.59	00.43
Matrix	Correction	ZAF

Fig. S2 Cyclic voltammograms of different catalysts in N₂-saturated (black line) and O₂-saturated (red line) 0.1 M KOH solution at a potential scan rate of 5mV s⁻¹. (a) as-sputtered, (b) Co/NS-CNT-400, (c) Co/NS-CNT-600, (d) Co/NS-CNT-800, (e) Co/N/CNT-600, and (f) NS-CNT-600,

