Co Nanoparticles on B, N-Co-doped sp^2/sp^3 Carbon: A Synergistic Catalyst Design for Sustainable Ammonia Production from Nitrate

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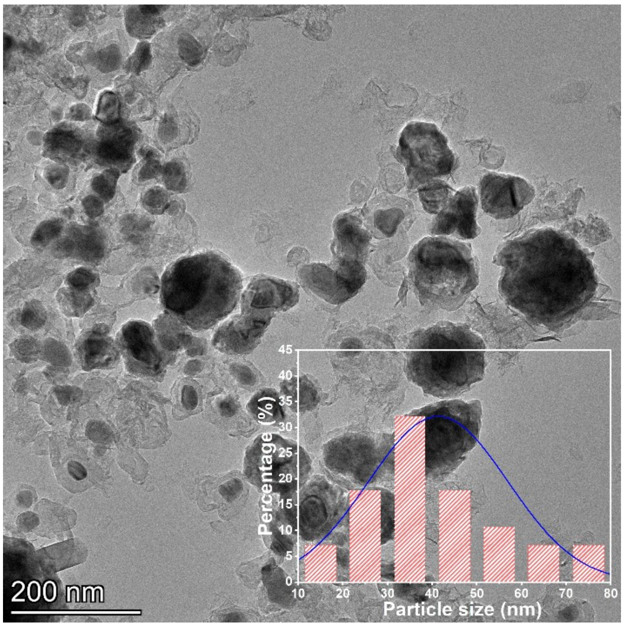

Figure S1. HR-TEM images of Co/NC (inset: corresponding particle size distribution)

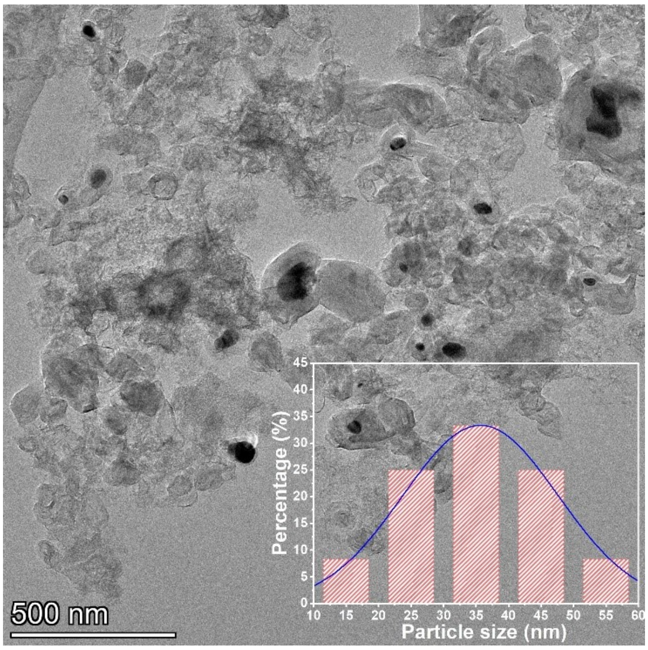

Figure S2. HR-TEM images of Co/NC (inset: corresponding particle size distribution)

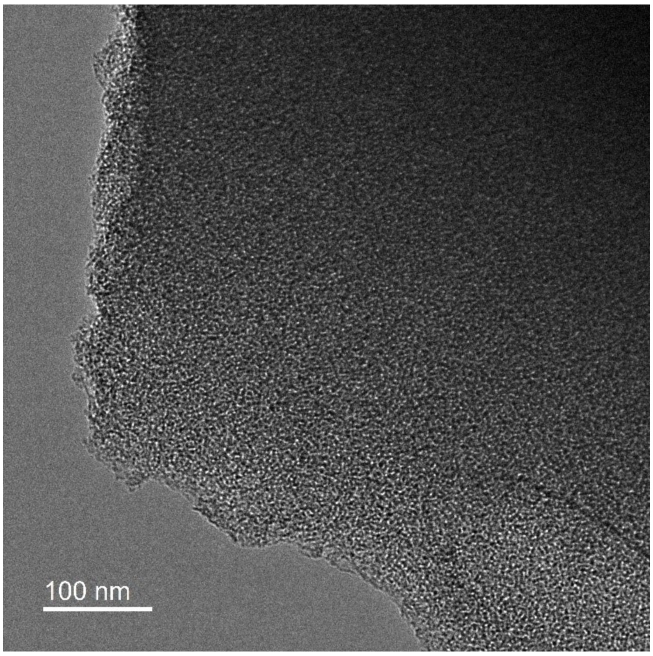

Figure S3. TEM images of BNC

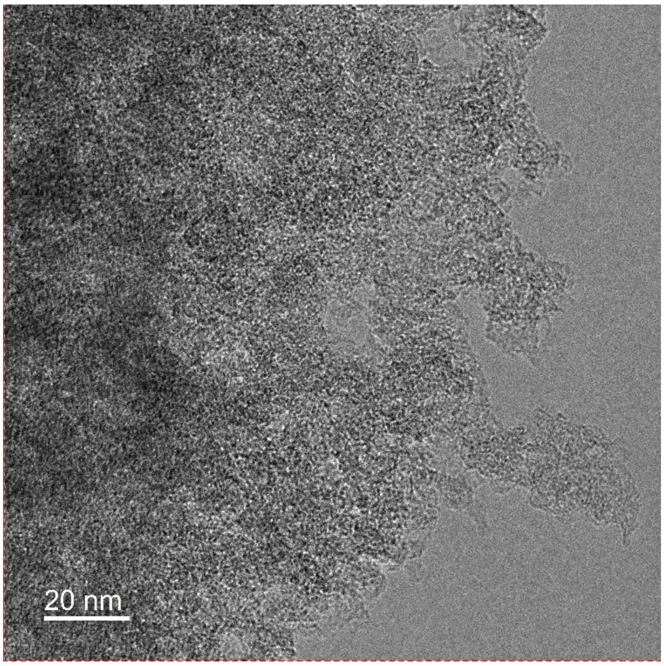

Figure S4. HR-TEM images of BNC

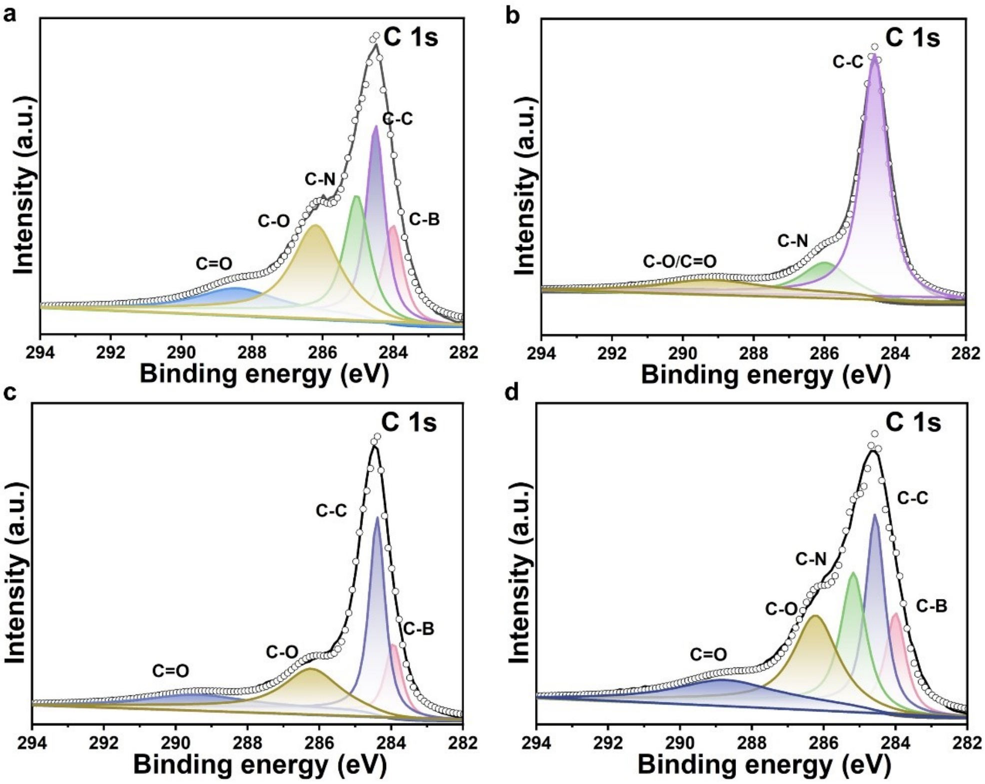

Figure S5. C 1s XPS spectra of Co/BNC, Co/NC, Co/BC and BNC

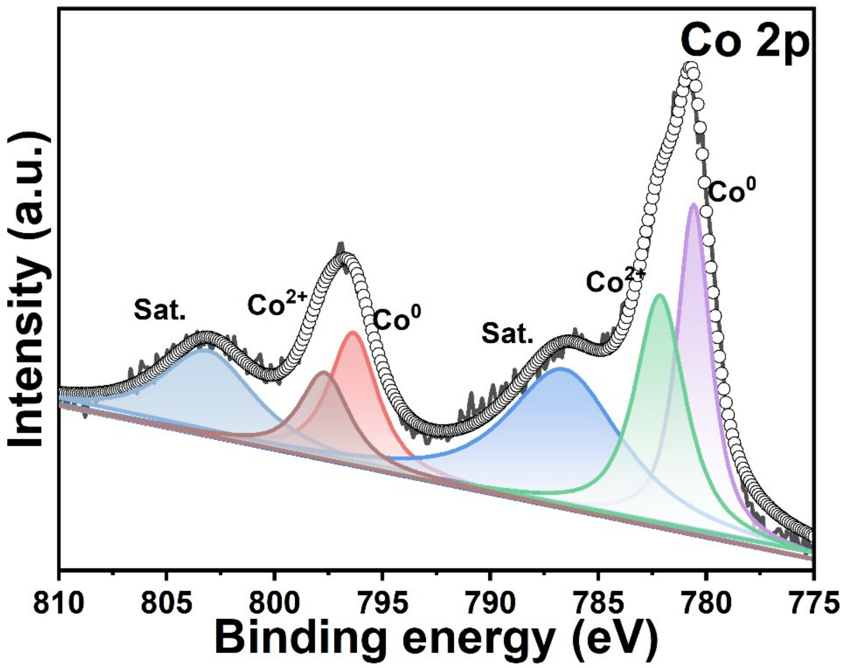

Figure S6. Co 2p XPS spectra of Co/NC

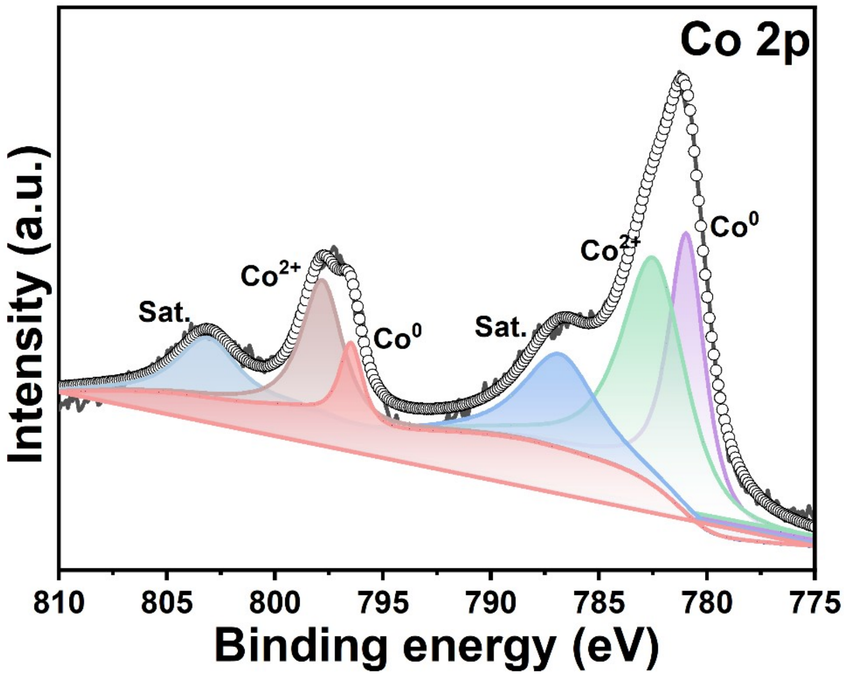

Figure S7. Co 2p XPS spectra of Co/BC

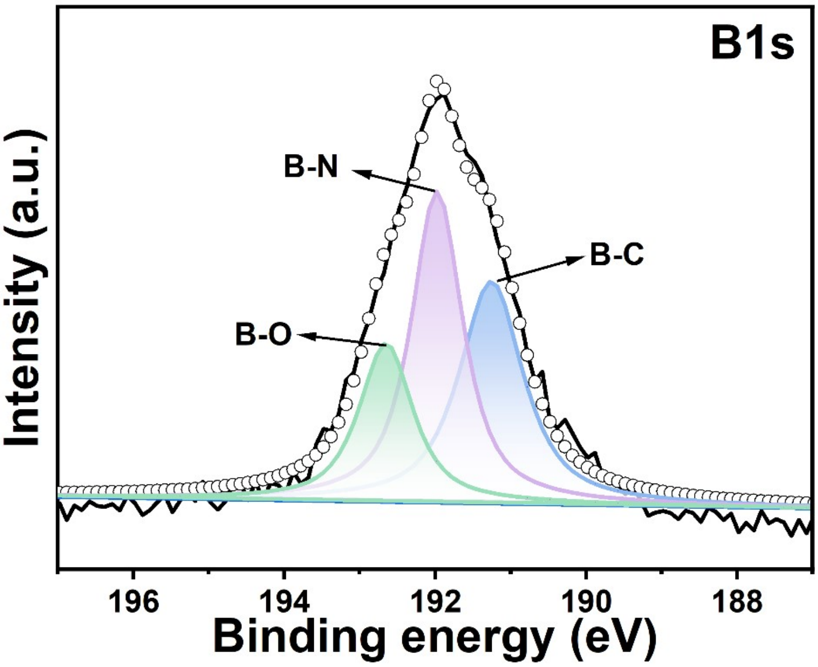

Figure S8. B 1s XPS spectra of Co/BNC

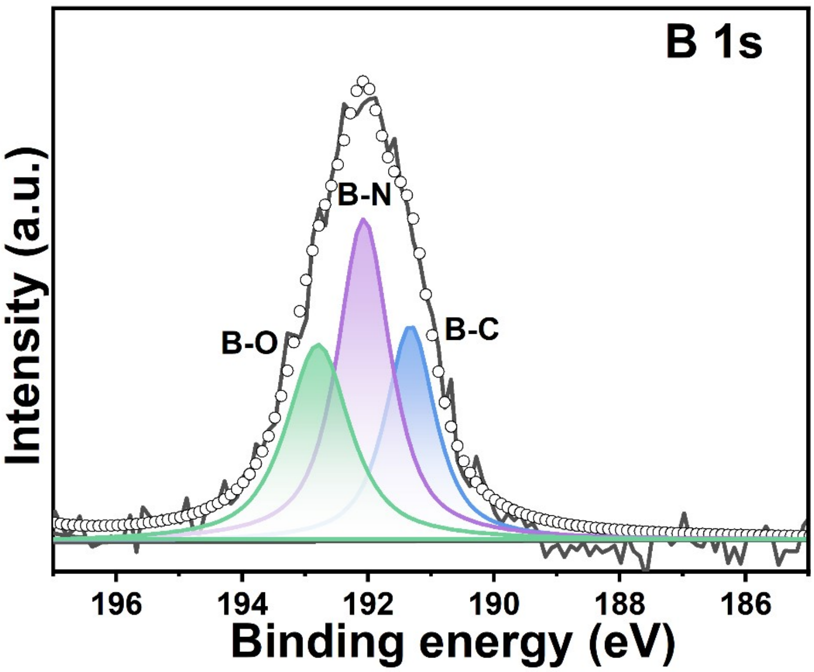

Figure S9. B 1s XPS spectra of Co/BC

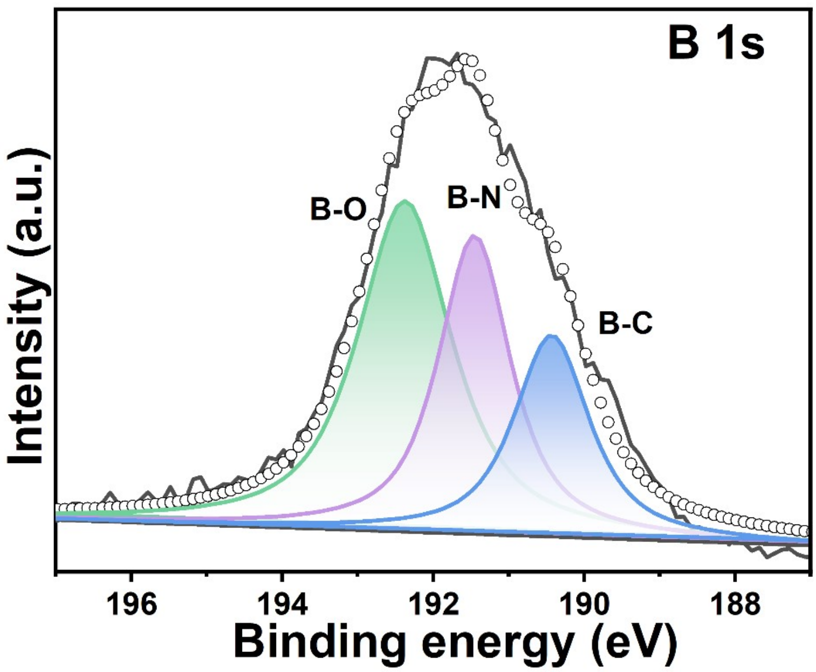

Figure S10. B 1s XPS spectra of BNC

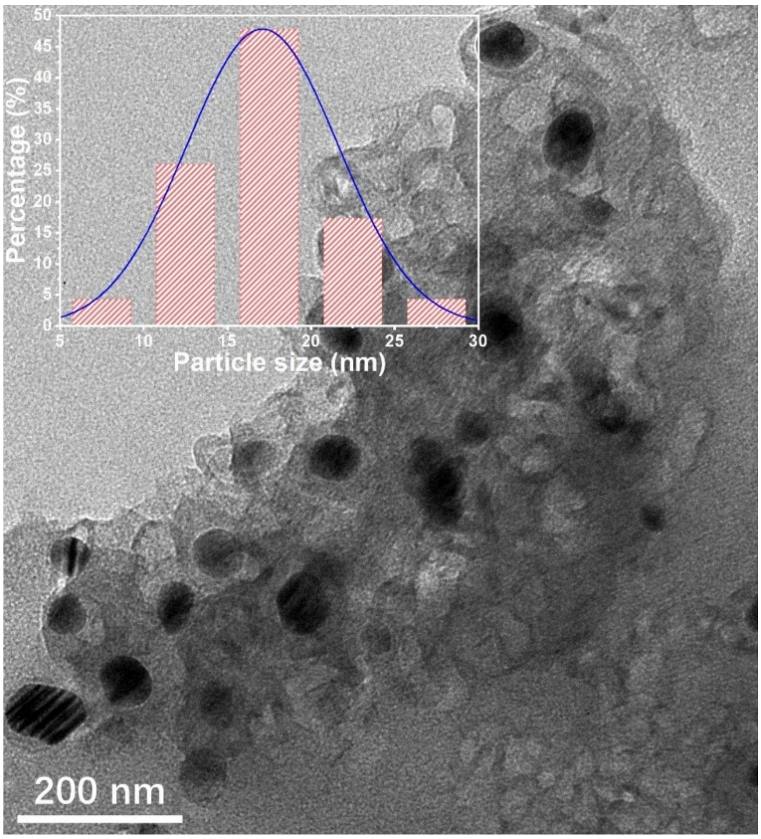

Figure S11. TEM images with corresponding particle-size distributions of Co/BNC after reaction

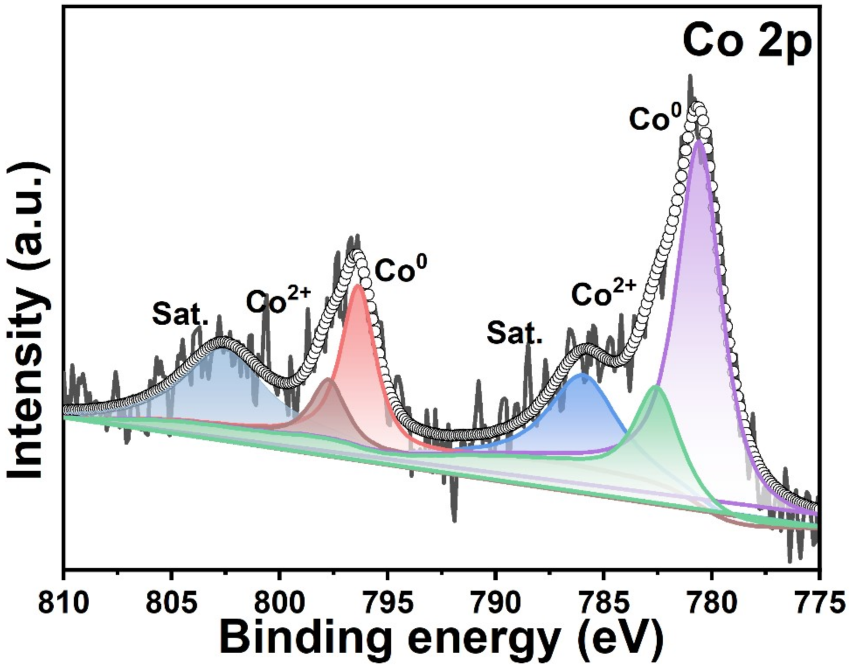

Figure S12. The Co 2p XPS spectra of Co/BNC after reaction

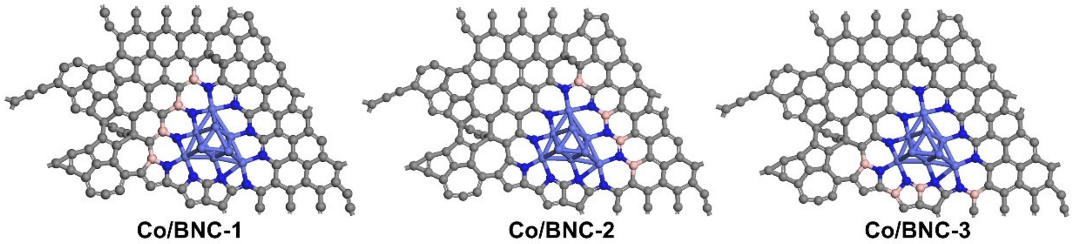

Figure S13. The optimized structures of Co/BNC-1, Co/BNC-1 and Co/BNC-3

Table S1. The metal content of catalysts.

Samples	Co (wt.%)
Co/BNC	9.42
Co/NC	8.65
Co/BC	10.07
BNC	0.002

Table S2 Comparison of overpotentials for the NO_3^-RR process in this work with that of other reported results in literatures

Catalyst	Electrolyte	Potential (V)	FE (%)	Yield rate (μg h^{-1} cm^{-2})	Ref.
Co/BNC	1M KOH+0.1MKNO_3	-0.4	98.31	2641.56	This work
NF/Ni_3N-Cu	1M KOH+0.1MKNO_3	-0.3	98.71	20230	[1]
Fe/Ni_2P	0.2 M K_2SO_4 + 0.05 M KNO_3	-0.4	94.3	4420	[2]
CuNi-LDHs	0.1 M KOH +0.1 M NO_3^-	-0.4	94.65	2737	[3]
PR-CuNC	0.1 M KOH +0.1 M NO_3^-	-0.5	94.61	3740	[4]
Ru-CuNW	1M KOH+0.1MKNO_3	0.04	96.11	2397	[5]
$NiCo_2O_4$/CC	0.1M KOH+0.1MKNO_3	-0.3	99	16541	[6]
Fe_2O_3NRs/CC	0.5M Na_2SO_4+0.1MKNO_3	-0.9	69.76	5576	[7]
Co_3CuN	0.5 M KOH +200ppm NO_3^-	-0.3	97	7735	[8]
Cu@C	1M KOH+0.1MKNO_3	-0.3	72	468.5	[9]
C/Co_3O_4	1M KOH+0.1MKNO_3	-0.6	100	4100	[10]
Cu@NF	1M KOH+0.1MKNO_3	-0.23	96.6	4284	[11]

Reference

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