Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Supplementary Figures and Tables

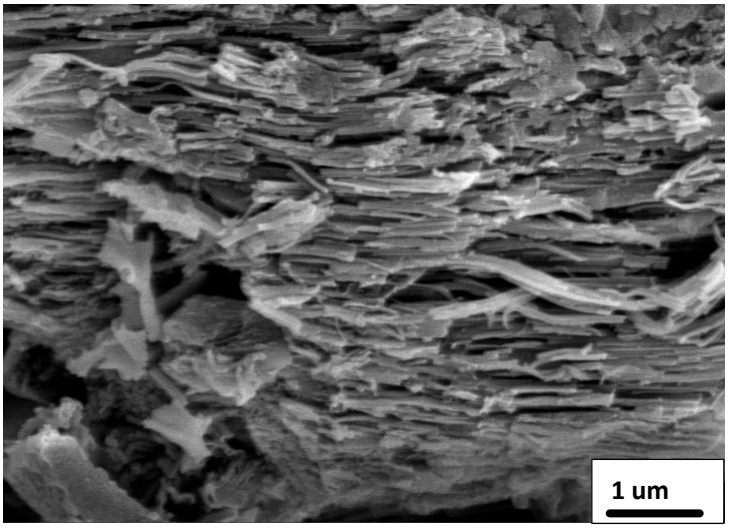

Fig. S1. SEM image of as-prepared hierarchical porous 2D ultrathin g-C_3N_4 nanosheets.

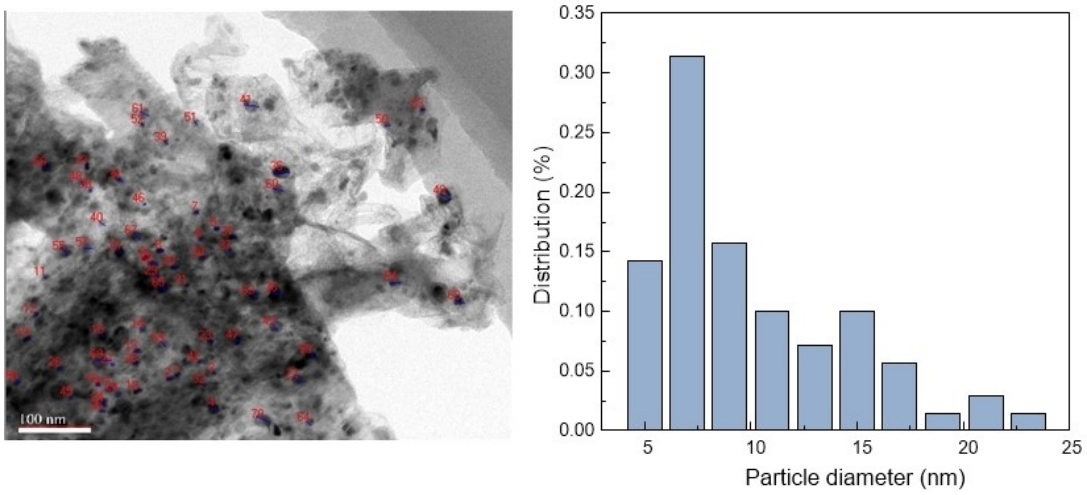

Fig. S2. Particle size analysis and distribution of the TEM images of the hierarchical porous $Co_{2.5}$-C_{TA1}@g-C_3N_4-700°C nanosheets by using a semiautomated sizing approach. Scale bars, 100 nm.

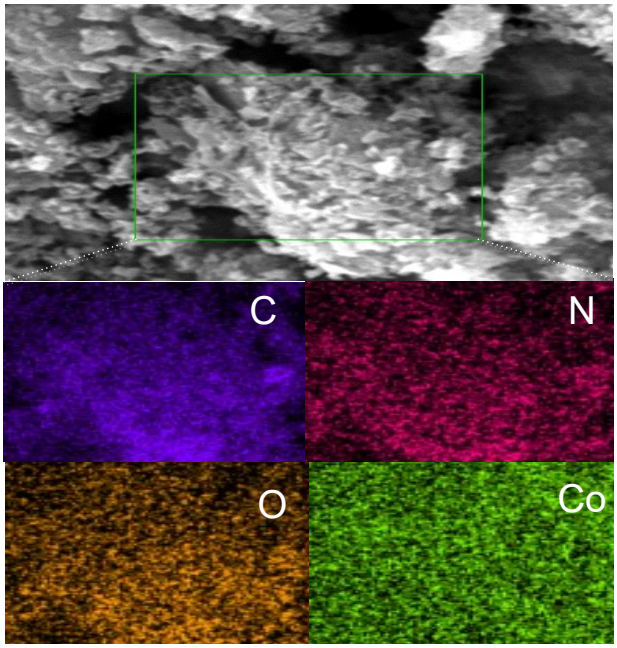

Fig. S3. EDX mapping of the $Co_{2.5}$-C_{TA1}@g-C_3N_4-700°C graphite-carbon hybrid heterostructured nanosheets. Scale bars, 5 um.

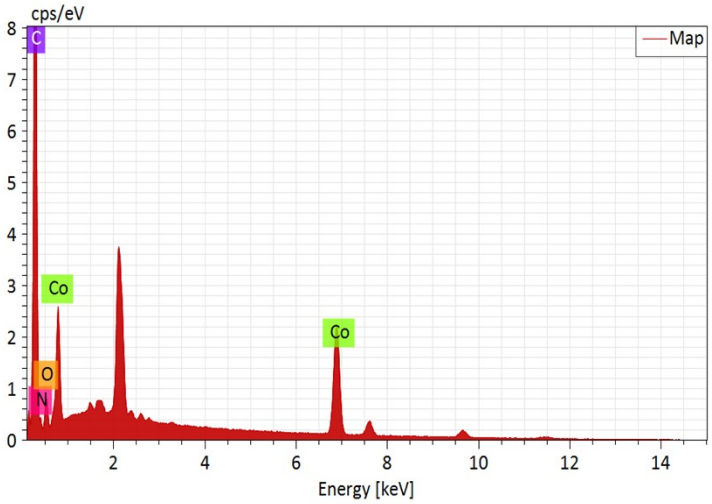

Fig. S4. The elemental analysis spectrum from EDX mapping of the hierarchical porous $Co_{2.5}$-C_{TA1}@g-C_3N_4 graphite-carbon hybrid nanosheets calcinated at 700°C.

Table S1 The elemental content analysis of the hierarchical porous $Co_{2.5}$-C_{TA1}@g-C_3N_4 nanosheets calcinated at 700°C by EDX characterization.

Element	Atomic number	Normalized atomic mass (%)
C	6	73.60
Co	27	8.22
O	8	5.00
N	7	11.20
Au	79	1.98

Table S2 The BET results of hierarchical porous $Co_{2.5}$-C_{TA1}@g-C_3N_4-700°C nanosheets

Sample	Specific surface area (cm^2 g^{-1})	Pore volume (cm^3 g^{-1})
$Co_{2.5}$-C_{TA1}@g-C_3N_4-700°C	335.9	0.858

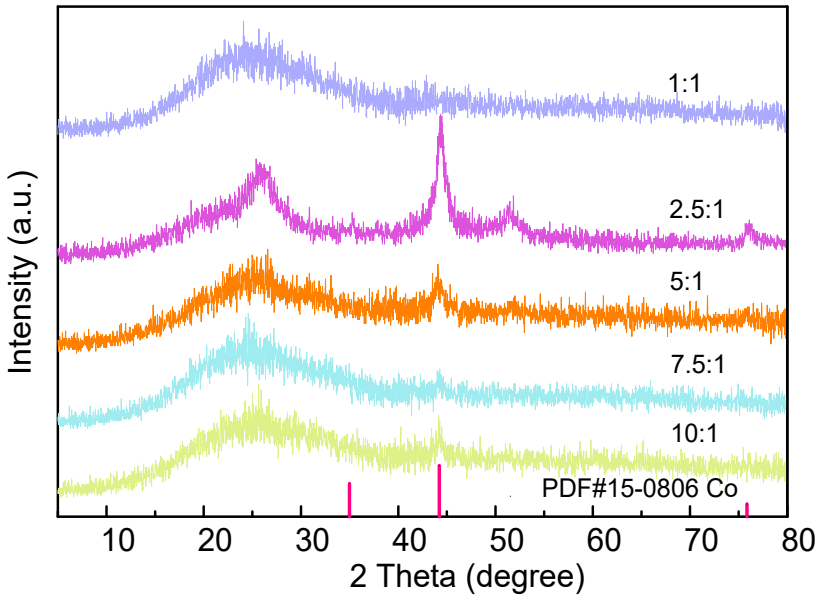

Fig. S5. XRD patterns of the hierarchical porous Co-C_{TA}@g-C_3N_4 nanosheets prepared with different ratios of Co/TA calcinated at 700°C.

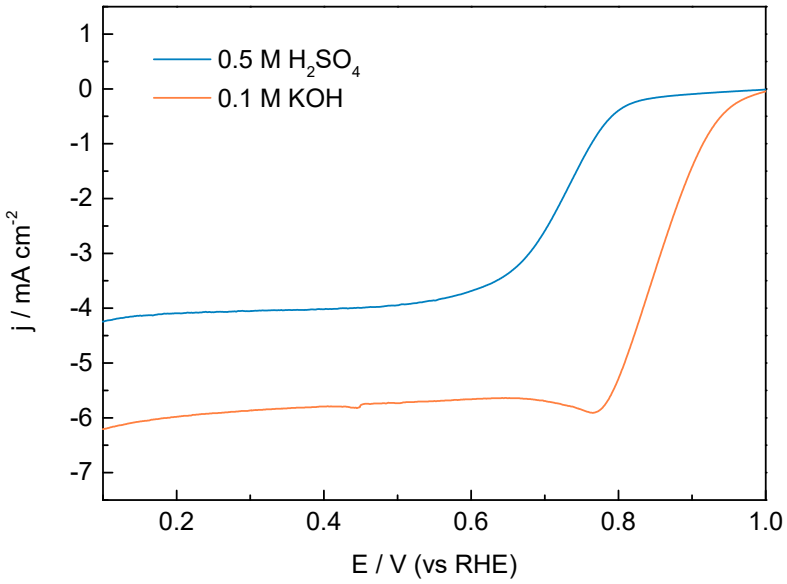

Fig. S6. LSV curves of $Co_{2.5}$-C_{TA1}@g-C_3N_4-700°C for ORR in 0.5 M H_2SO_4 and 0.1 M KOH solutions.

Table S3 Comparison of electrochemical properties of Pt/C, $Co_{2.5}$-C_{TA1}@g-C_3N_4-700℃ nanosheets in alkaline and acidic electrolytes.

Samples	E_{Onset} E（V vs. RHE）	$E_{1/2}$ E（V vs. RHE）	Limiting current density J（mA cm^{-2}）
$Co_{2.5}$-C_{TA1}@g-C_3N_4-700°C (0.1 M KOH)	0.990	0.864	-6.3
$Co_{2.5}$-C_{TA1}@g-C_3N_4-700°C (0.5 M H_2SO_4)	0.912	0.735	-4.2
20% Pt/C (0.1 M KOH)	0.994	0.878	-5.1

Table S4 Electrochemical performance comparison of the hierarchical porous Co-C_{TA}@g-C_3N_4 nanosheet prepared with different ratios of Co/TA calcinated at 700°C.

Samples	E_{Onset} E（V vs. RHE）	$E_{1/2}$ E（V vs. RHE）	Limiting current density J（mA cm^{-2}）
Co@g-C_3N_4-700°C	0.826	0.598	-2.2
C_{TA}@g-C_3N_4-700°C	0.724	0.613	-3.5
Co_1-C_{TA1}@g-C_3N_4-700°C	0.875	0.715	-2.7
$Co_{2.5}$-C_{TA1}@g-C_3N_4-700°C	0.990	0.864	-6.3
Co_5-C_{TA1}@g-C_3N_4-700°C	0.989	0.861	-5.7
$Co_{7.5}$-C_{TA1}@g-C_3N_4-700°C	0.980	0.871	-4.1
Co_{10}-C_{TA1}@g-C_3N_4-700°C	0.975	0.865	-4.2
20% Pt/C	0.994	0.878	-5.1