

Supporting Information

Characterization and electrocatalytic performance of molasses derived co-doped (P, N) and tri-doped (Si, P, N) carbon for the ORR

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BET pore size distribution

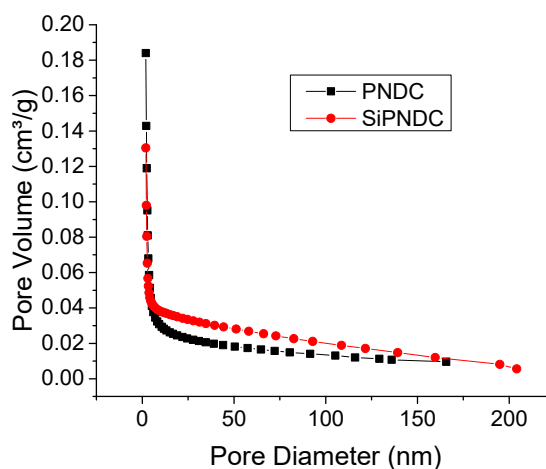


Figure S1. Pore size distribution of PNDC and SiPNDC

XPS Narrow scans

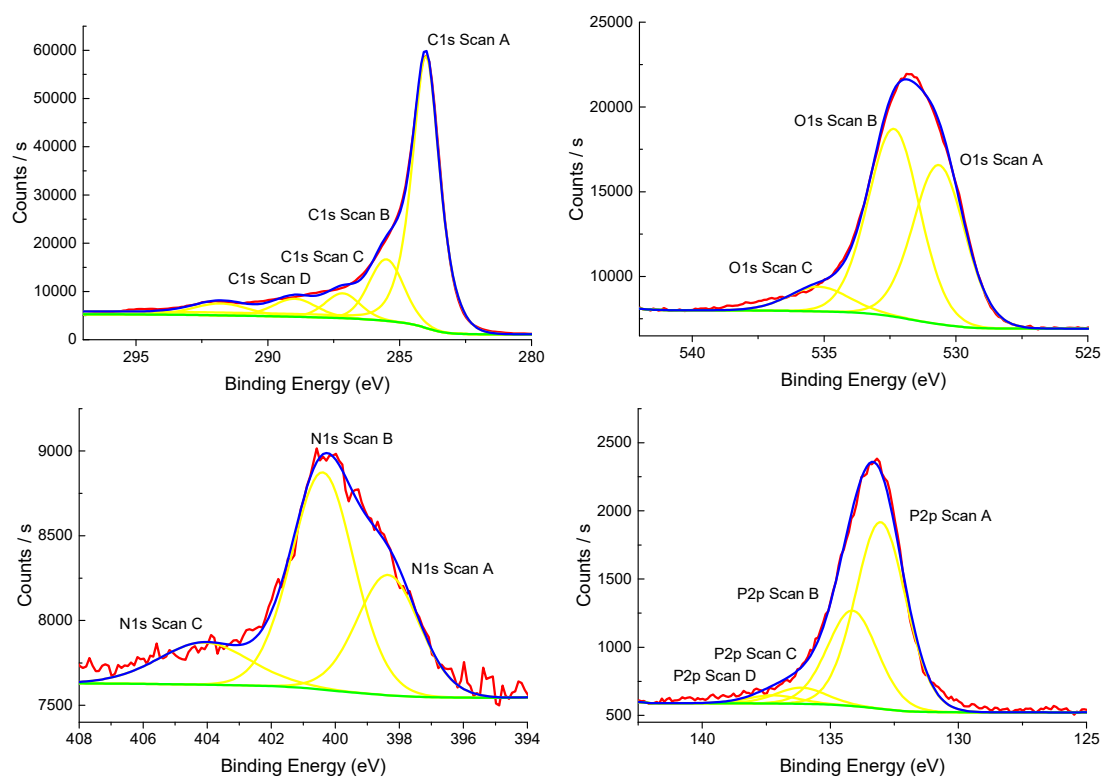


Figure S2. XPS narrow scan plots of C1s, O1s, N1s, and P2p for PNDC material

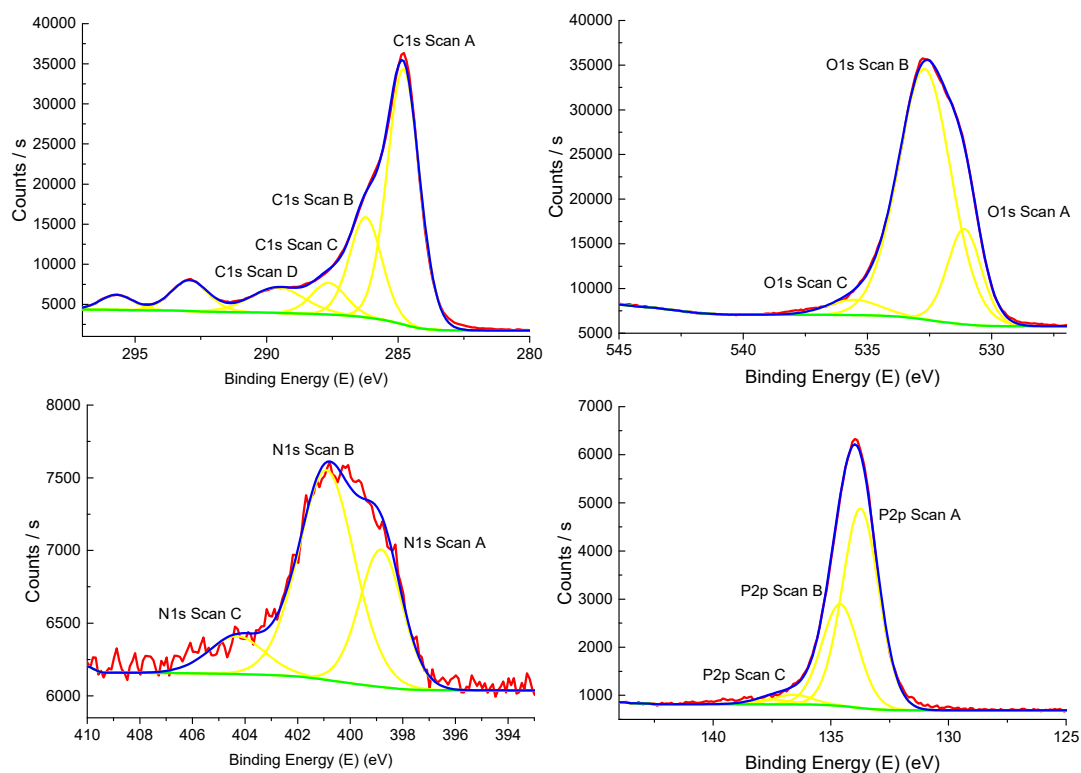


Figure S3. XPS narrow scan plots of C1s, O1s, N1s, and P2p for SiPNDC material

Table S1. Atomic % and bonding environments from XPS narrow scan analysis

Element	PNDC (BE in eV; At%)	SiPNDC (BE in eV; At%)
C1s Scan A	284.8; 70.15	284.8; 59.08
C1s Scan B	286.3; 16.86	286.2; 23.31
C1s Scan C	287.9; 6.82	287.6; 7.83
C1s Scan D	289.2; 6.16	289.6; 9.77
O1s Scan A	531.4; 50.03	531.1; 18.67
O1s Scan B	533.1; 42.27	532.7; 76.67
O1s Scan C	536.0; 7.68	535.5; 4.65
N1s Scan A	399.1; 30.04	398.8; 29.96
N1s Scan B	401.9; 54.51	400.9; 59.28
N1s Scan C	404.8; 15.45	404.38; 10.75
P2p Scan A	133.8; 92.77	133.7; 89.86
P2p Scan B	136.9; 7.75	136.6; 8.55
P2p Scan C	---	137.5; 1.57

RDE: calculation of number of electrons, n

For calculation of number of electrons, n, the following equation was derived from Figure 6 and Equations 1 and 2:

$$n = \frac{1}{0.620 F C D^{2/3} \nu^{-1/6} * slope} \quad (S1)$$

From K-L plot of SiPNDC at 700 mV, the slope was determined to be 2310 mA⁻¹ cm² s^{-1/2} rad^{1/2}. After plugging in other variables (F (96485 C mol⁻¹), C (1.26 x 10⁻⁶), D (1.9 x 10⁻⁵), and ν (1.1 x 10²)), a value of 3.76 was recorded for number of electrons transferred.