Electronic Supplementary Material (ESI) for Materials Horizons.

Supplementary information

Metal-free Ionic Liquid-derived Electrocatalyst for High-Performance Oxygen Reduction in Acidic and Alkaline Electrolytes

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Supplementary Figures

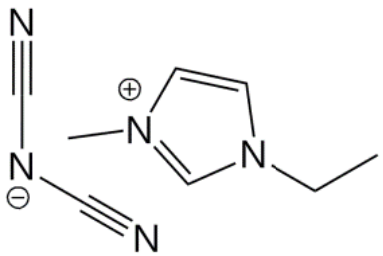

Fig. S1. 1-ethyl-3-methylimidazolium dicyanamide (Emim-dca).

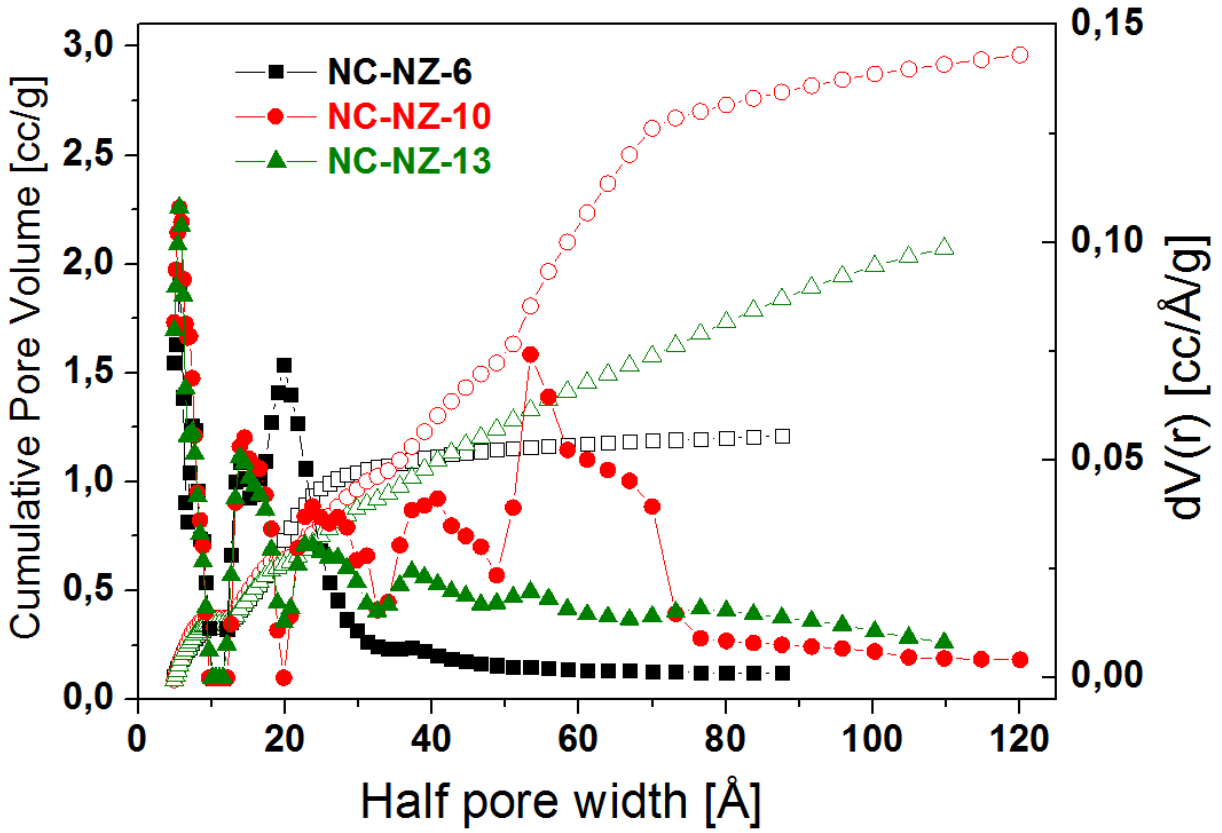

Fig. S2. Pore size distribution and cumulative pore volume of NCs obtained using different mass ratios of ionic liquid and NZ salt melt.

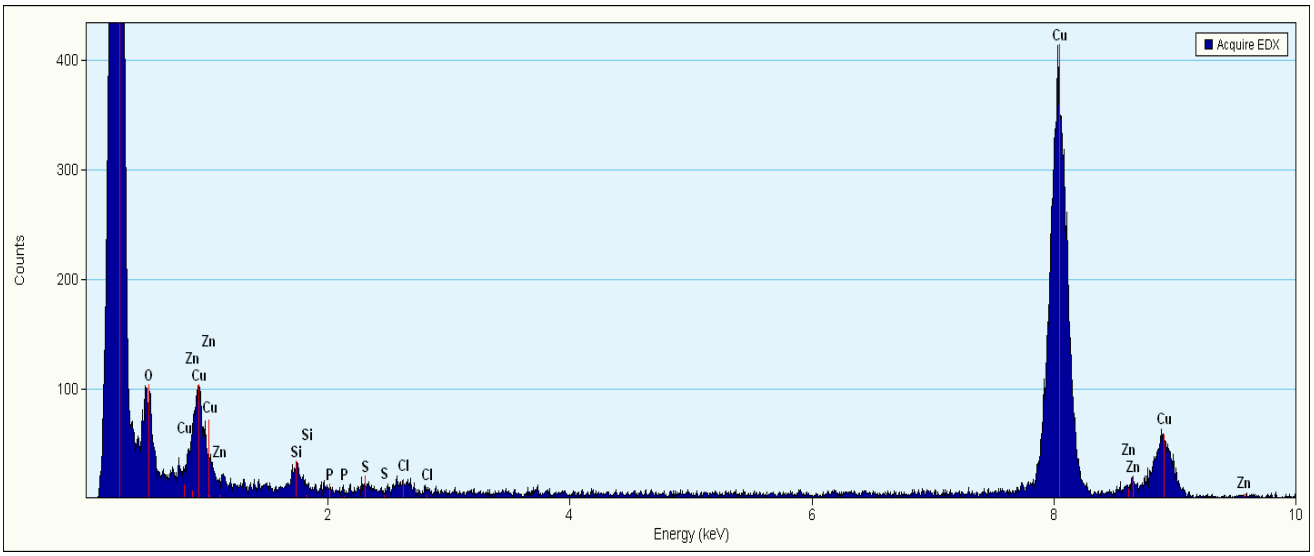

Fig. S3. EDX spectra of NC-NZ-13 depicting the absence of transition metal impurities except Zn that comes from salt templating method of synthesis.

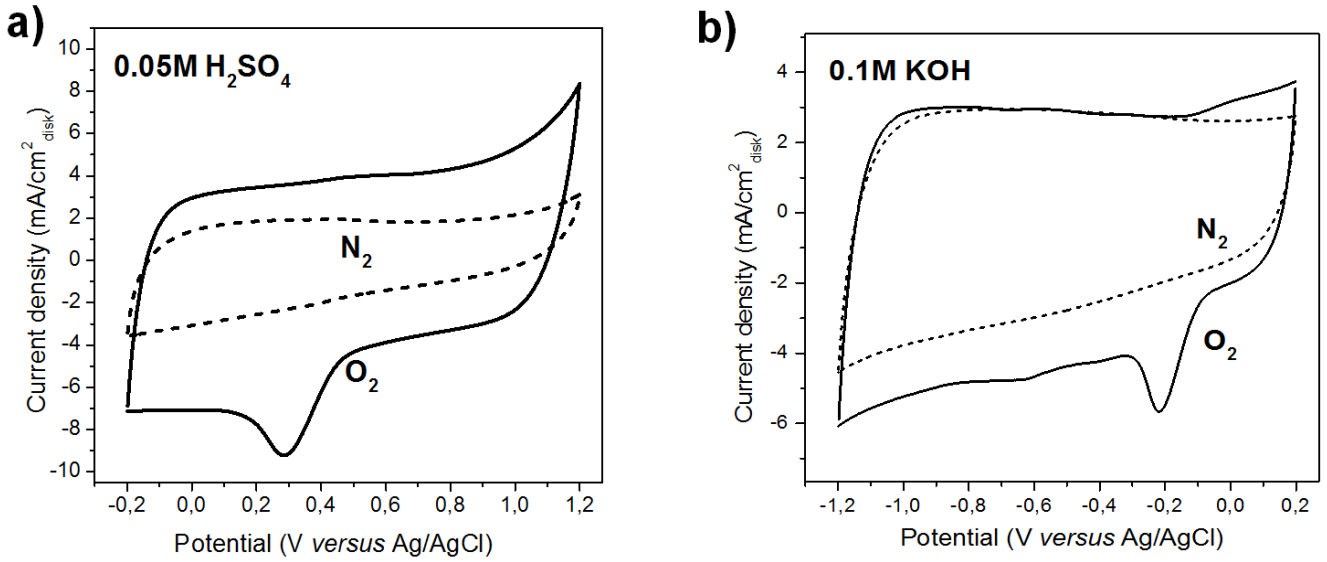

Fig. S4. CV curves obtained for NC-NZ-13 at scan rate 100mVs^{-1} in N_2 (dash) and O_2 (solid) saturated (a) 0.05M H_2SO_4 and (b) 0.1M KOH solutions.

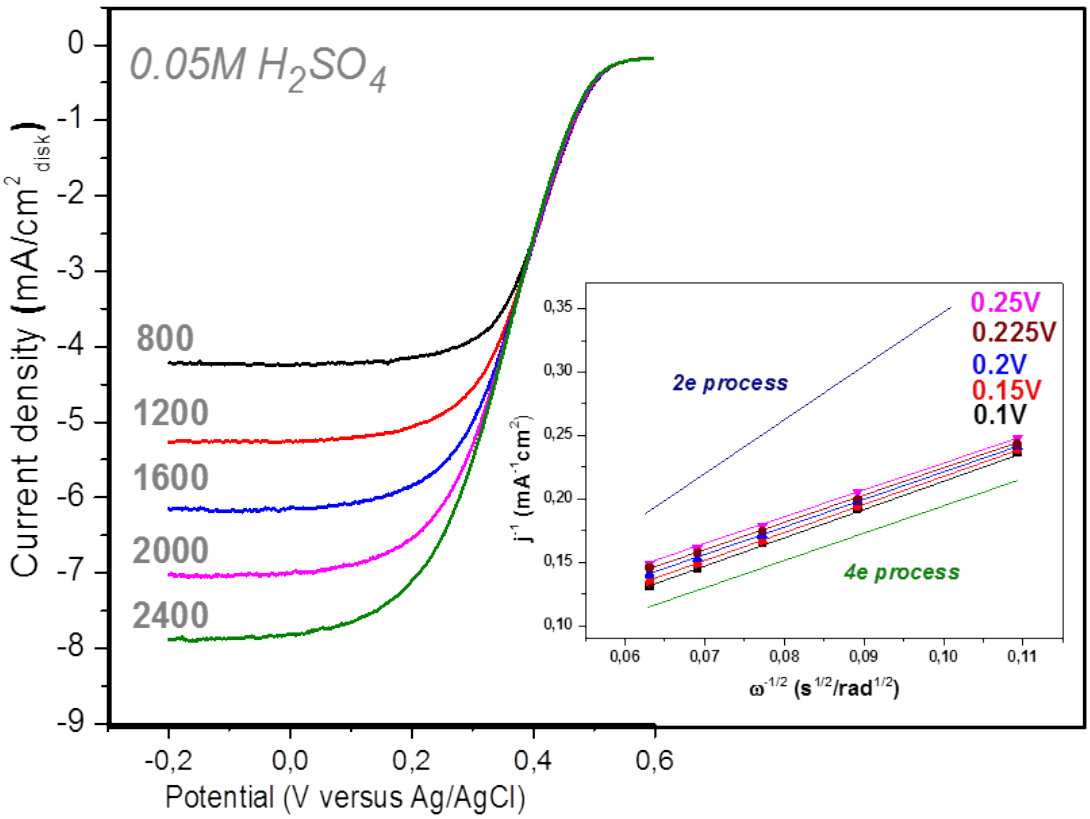

Fig. S5. Rotating-disk voltammograms of NC-NZ-13 (loading of 0.21 mgcm^{-2}) in O_2-saturated 0.05M H_2SO_4 with a sweep rate of 10 mVs^{-1} at different rotation speeds. The insert shows corresponding Koutecky-Levich plots at different potentials. The calculated number of transferred electrons was found to be in the range 3.95-4.03 suggesting a 4*e* oxygen reduction process.

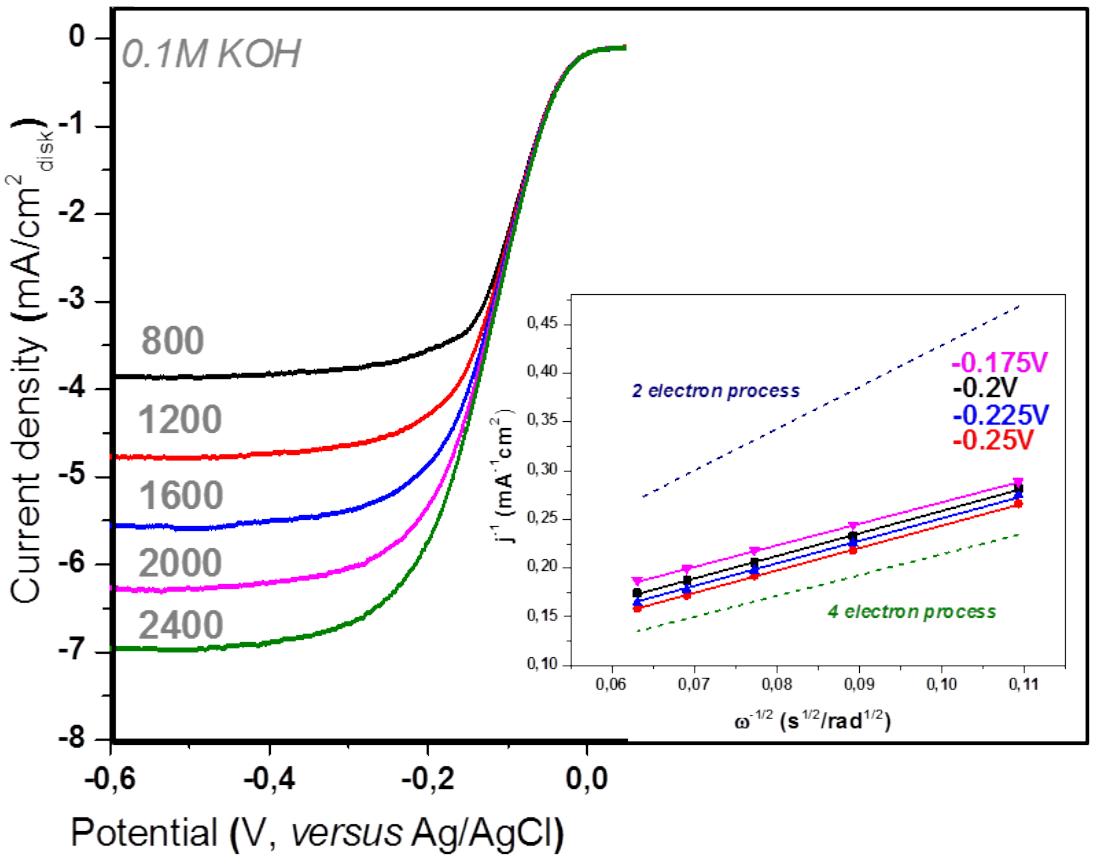

Fig. S6. Rotating-disk voltammograms of NC-NZ-13 (loading of 0.21 mgcm^{-2}) in O_2-saturated 0.1M KOH with a sweep rate of 10 mVs^{-1} at different rotation speeds. The insert shows corresponding Koutecky-Levich plots at different potentials. The calculated number of transferred electrons was found to be in the range 3.96-4.1 suggesting a 4*e* oxygen reduction process.