Supporting Information

Design and Optimization of Chromium-Based Polymeric Catalysts for Selective Electrocatalytic Synthesis of Hydrogen Peroxide

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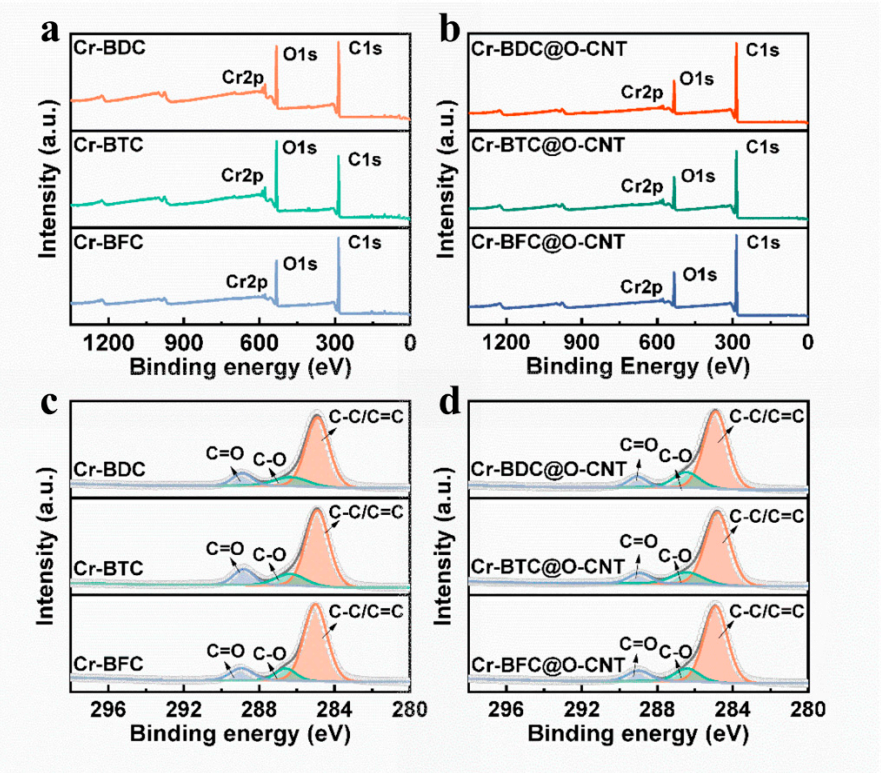


Figure S1. (a) and (b) High-resolution XPS spectra of the survey spectra of the catalysts. (c) and (d) C spectra.

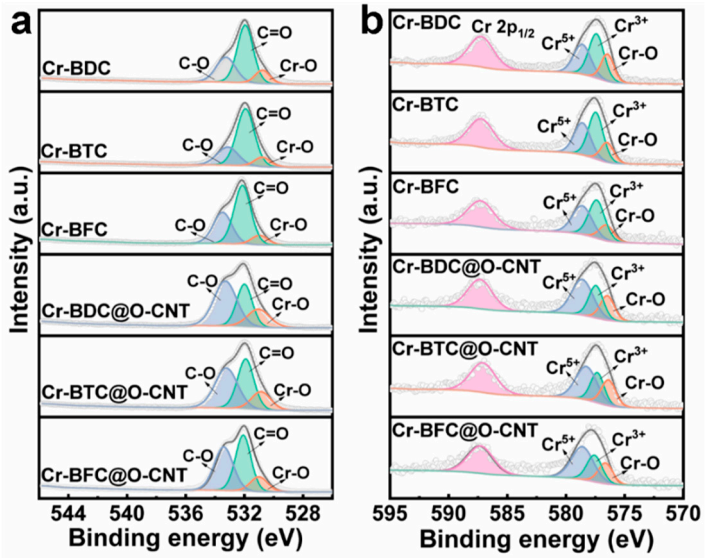


Figure S2. XPS survey spectra and high-resolution XPS spectra of (a) O1s and (b) Cr 2p.

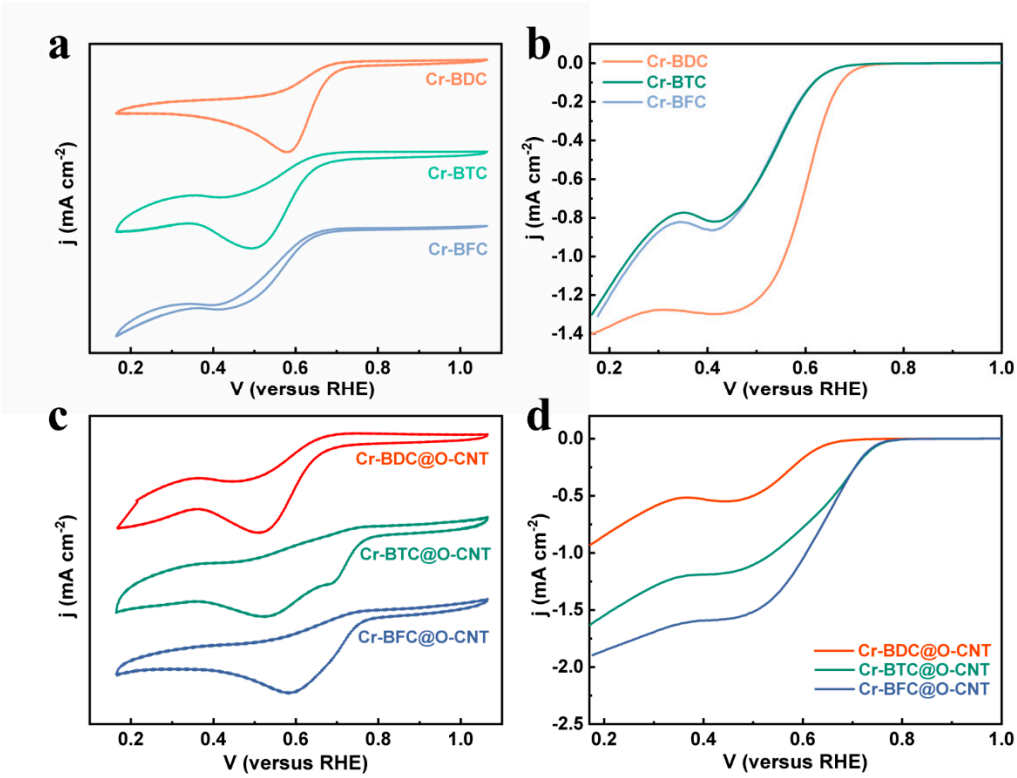


Figure S3. (a) and (c) CV, (b) and (d) LSV curves of catalysts.

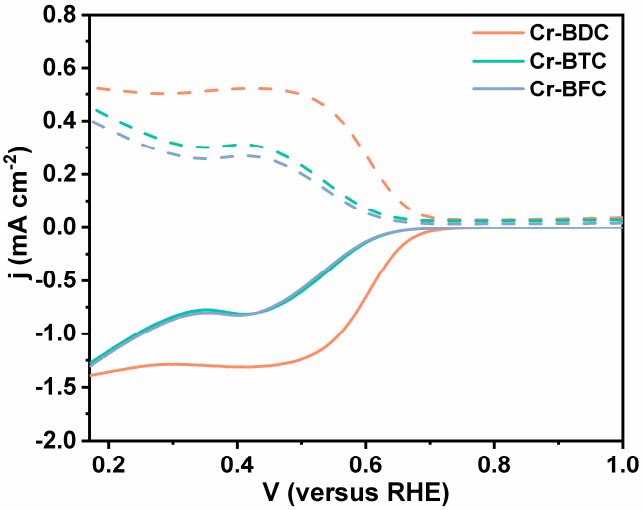


Figure S4. Polarization curves of catalysts on RRDE at 1600 rpm (solid line: disk current; dashed line: ring current).

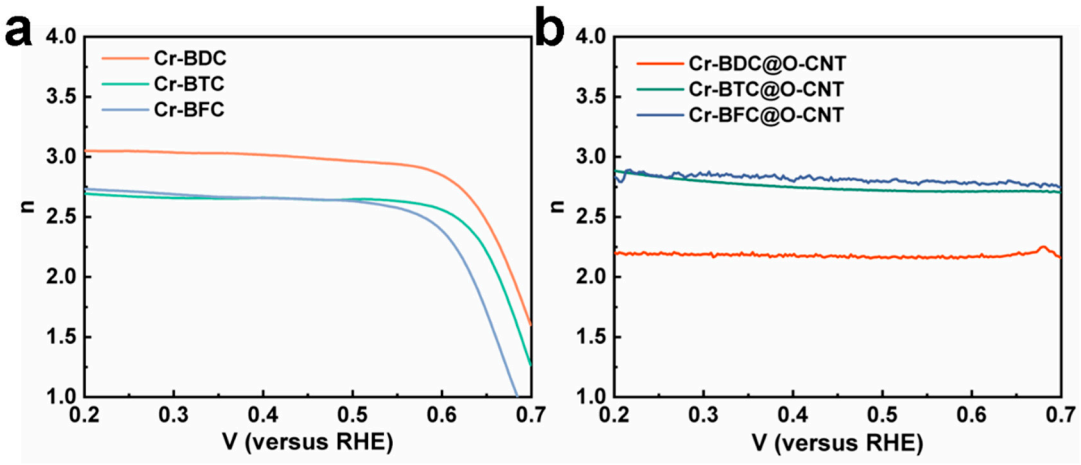


Figure S5. The number of electrons transferred of various catalysts during ORR.

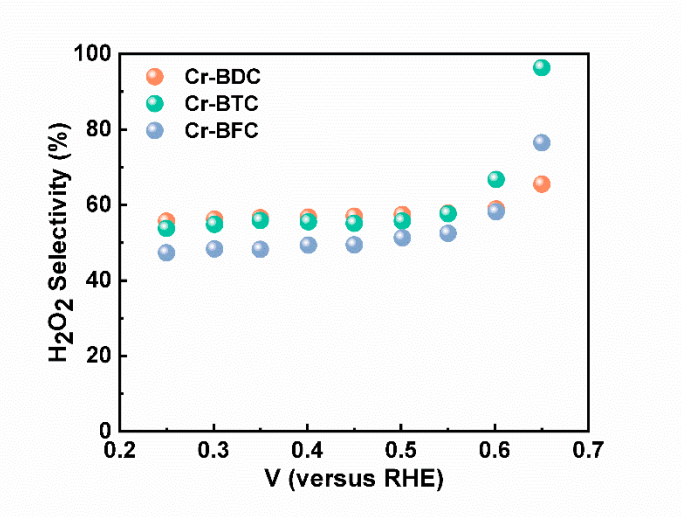


Figure S6. The corresponding H_2O_2 selectivity of pure MOP catalysts under different potentials.

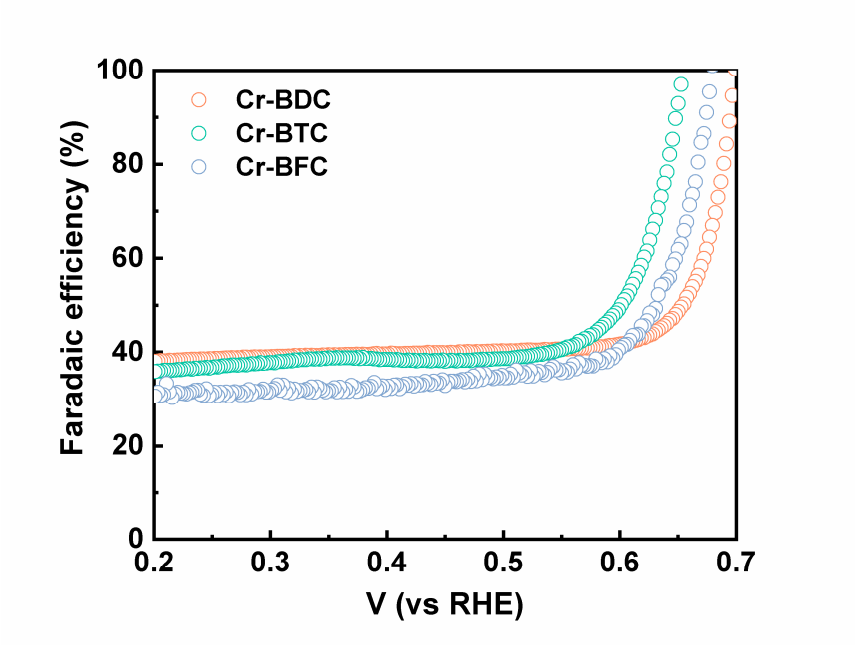


Figure S7. Faradic efficiency to the applied potential, calculated from the RRDE experiments with O_2 saturation at a scan rate of 10 mV s^{-1} and 1600 rpm of the working electrode.

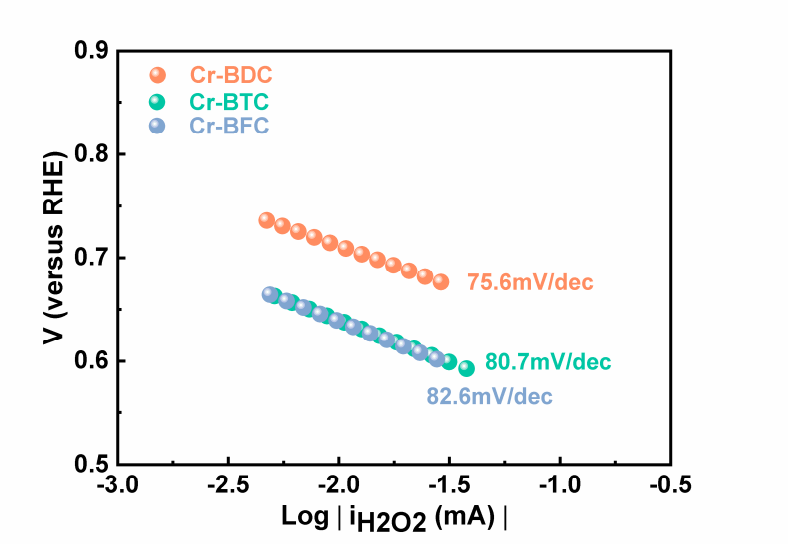


Figure S8. Tafel plots of pure MOP catalysts

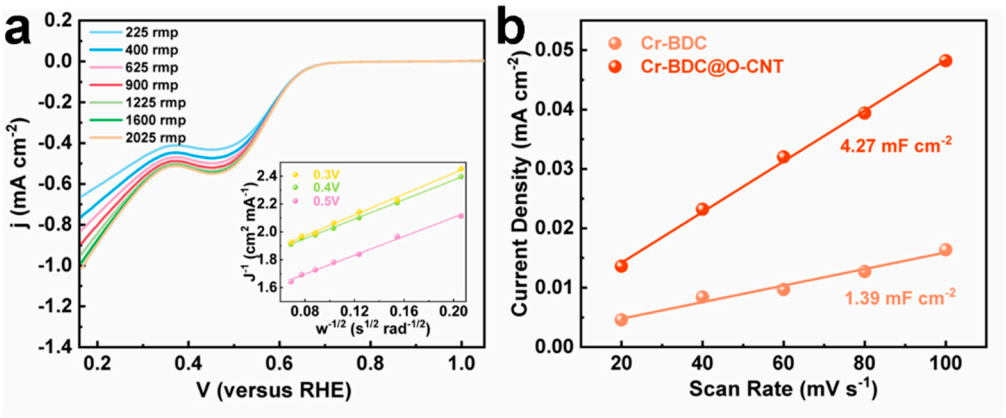


Figure S9. (a) LSV curves of Cr-BDC@O-CNT tested at different rotation rate from 225 to 2025 rpm. The insert: K-L plots of Cr-BDC@O-CNT from 0.3 to 0.5 V vs. RHE. (b) ECSA plots of Cr-BDC and Cr-BDC@O-CNT@BP2000.

Table S1.1 The atomic content ratio of the three catalysts from XPS.

	C1s			O1s		
	C-C/C=C	**C=O**	**C-O**	**Cr-O**	**C=O**	**C-O**
Cr-BDC	54.34%	8.69%	10.32%	2.96%	14.10%	7.33%
Cr-BDC@O-CNT	62.30%	6.85%	13.71%	3.16%	5.14%	7.92%
Cr-BTC	49.72%	8.94%	9.45%	2.86%	19.11%	7.26%
Cr-BTC@O-CNT	62.28%	7.47%	11.83%	2.9%	6.77%	7.43%
Cr-BFC	59.86%	9.58%	8.38%	1.93%	12.07%	7.00%
Cr-BFC@O-CNT	63.43%	8.25%	10.78%	2.24%	7.72%	7.25%