

Steam-Activated High Specific Surface Area of Bio-derived Porous Carbon as Sustainable Metal-Free Electrocatalyst for Hydrogen Evolution Application

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Table S1. Specific surface are and porosity information of pecan shell-derived hierarchical porous carbons.

Sample	Specific surface area (m ² g ⁻¹)	Total pore volume (cm ³ g ⁻¹)	Mean pore diameter [nm]	Mesopore surface area [m ² g ⁻¹]	Micropore volume [cm ³ g ⁻¹]	Micropore surface area [m ² g ⁻¹]
N-PSAPC-600	527	0.233	1.78	10.42	0.20	517
N-PSAPC-650	628	0.30	1.97	23.3	0.25	604.7
N-PSAPC-700	879	0.48	2.22	38.5	0.40	841

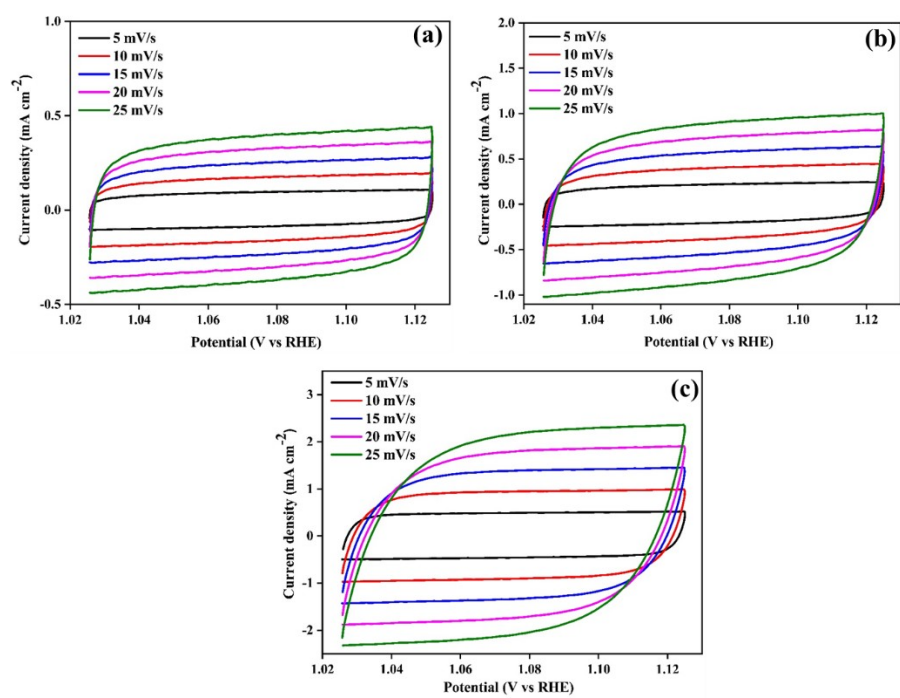


Figure S1. CV curves of (a) N-PSAPC-600, (b) N-PSAPC-650, and (c) N-PSAPC-700 at different scan rates

Table S2. Comparative catalytic (HER) performance of previously reported electrocatalysts and the present work.

Catalyst	Precursor	Electrolyte	Overpotential (mV) at 10 mA/cm ²	Ref.
PSAC	Peanut Shells	H ₂ SO ₄	390	[1]
CCW	Coffee Waste	H ₂ SO ₄	210	[2]
HPNS	Palm Waste	H ₂ SO ₄	330	[3]
KCl-900	Waste Silk Fabrics	H ₂ SO ₄	336	[4]
NACS	Ooty Varkey	H ₂ SO ₄	380	[5]
NPCSS	Corn Stalks	KOH	195	[6]
HPBWPCNSs	Honeycomb Polypore Biomass Waste	H ₂ SO ₄	447	[7]
NA9	Broccoli Stem	H ₂ SO ₄	184	[8]
CCC-PAN	Cotton cloth	NaOH	233	[9]
N-PC	Golden Shower Pod	KOH	179	[10]
C-750	Acorus Calamus	KOH	330	[11]
N-PSAPC	Pecan shells	KOH	141	Present work

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