

In Situ Fabrication of Dendritic Tin-Based Carbon Nanostructures for Hydrogen Evolution Reaction

Oluwafunmilola Ola^{a*}, Yu Chen^b, Kunyapat Thummavichai^{b, c} and Yanqiu Zhu^b

^aFaculty of Engineering, The University of Nottingham, University Park, Nottingham, NG7 2RD, United Kingdom

^bCollege of Engineering, Mathematics and Physical Sciences, University of Exeter, EX4 4QF, UK

^cKey Laboratory of New Processing Technology for Nonferrous Metals and Materials, Ministry of Education, School of Resources, Environment and Materials, Guangxi University, Nanning, China.

*Corresponding author. Tel: +44 1157 487264. E-mail: Oluwafunmilola.Ola@nottingham.ac.uk

Supporting Information:

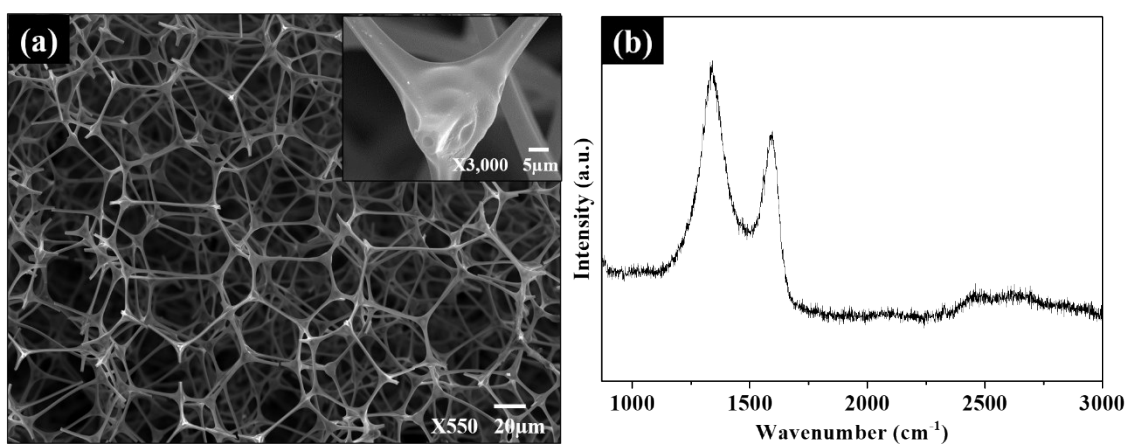


Figure S1. SEM (a) and Raman spectrum (b) of bare structure of g-C₃N₄ before CVD growth with SnCl₂-C₂H₅O precursor.

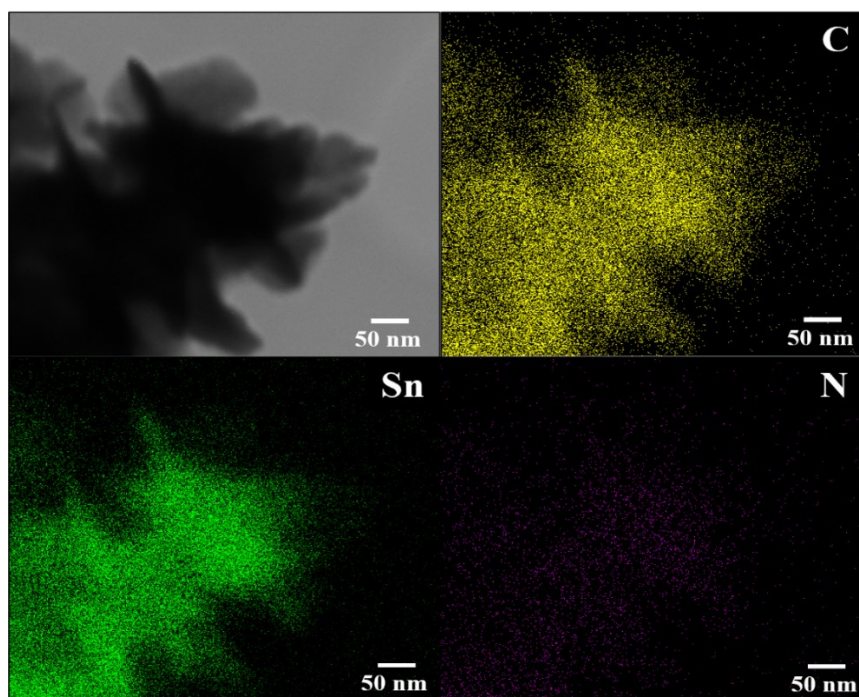


Figure S2. Elemental mapping of Sn_NCF2.

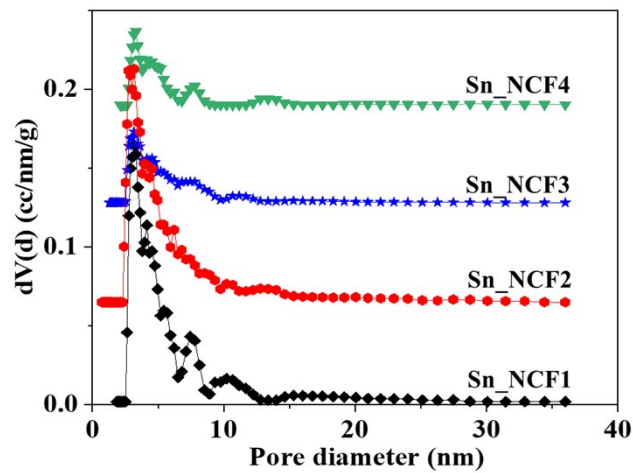


Figure S3. Pore size distribution of dendritic Sn/C nanostructured samples

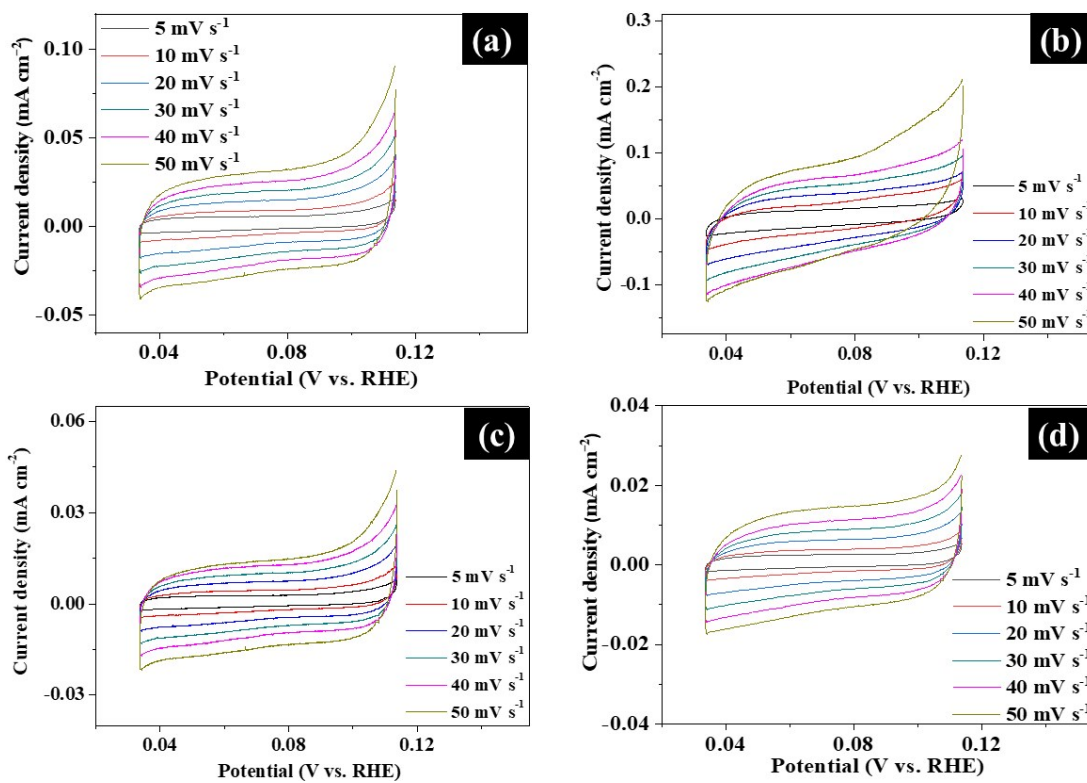


Figure S4. Cyclic voltammograms of Sn_NCF1 (a), Sn_NCF2 (b), Sn_NCF3 (c) and Sn_NCF4 (d), at scan rates within the range of 5 – 50 mV s^{-1}

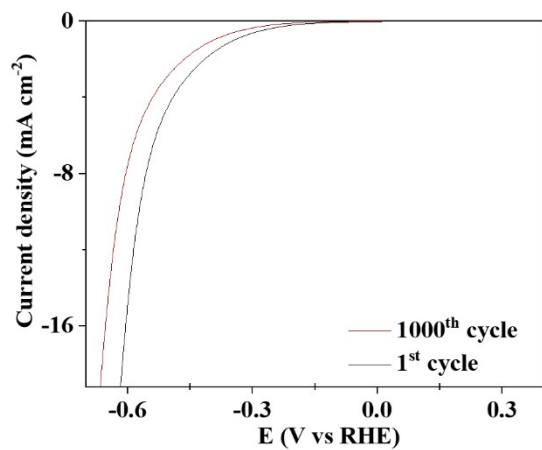


Figure S5. Polarization curve of g-C₃N₄ before and after 1000 cycles

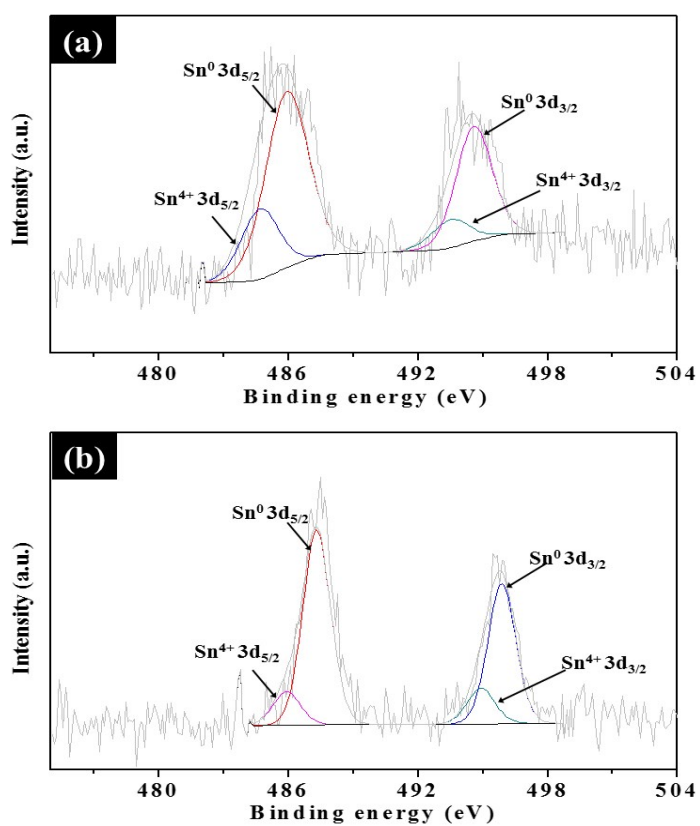


Figure S6. XPS spectrum of Sn 3d for Sn_NCF2 (a) before and (b) after cyclic HER testing for 8 hours

Table S1. Specific surface area and total pore volume of g-C₃N₄ and dendritic Sn/C nanostructured samples

Samples	BET specific surface area (m ² g ⁻¹)	Total pore volume (cm ³ g ⁻¹)
g-C ₃ N ₄	76.52	0.21
Sn_NCF1	107.33	0.34
Sn_NCF2	99.89	0.31
Sn_NCF3	86.91	0.27
Sn_NCF4	73.24	0.19

Table S2: Comparison of the HER performance for different carbon-based nanocomposites.

Catalysts	Electrolyte concentration (mol L ⁻¹)	Potential at -10 mA cm ⁻² (V vs. RHE)	Tafel slope (mV dec ⁻¹)	Reference
Sn_NCF2	0.5 M H ₂ SO ₄	0.260	53	This work
g-C ₃ N ₄ @S-Se-pGr	0.5 M H ₂ SO ₄	0.300	86	[9]
CoPt/mpg-C ₃ N ₄	0.5 M H ₂ SO ₄	-	109	[11]
NG_Mo	0.1 M H ₂ SO ₄	0.141	105	[21]
C ₃ N ₄ @NG	0.5 M H ₂ SO ₄	0.240	51.1	[22]
N,S-G	0.5 M H ₂ SO ₄	0.276	81	[18]
N,P-G	0.5 M H ₂ SO ₄	0.420	91	[19]

References:

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