Supporting Information

Porous nitrogen-enriched carbonaceous material from marine waste: chitosan-derived layered CNX catalyst for aerial oxidation of 5-hydroxymethylfurfural (HMF) to 2,5-furandicarboxylic acid

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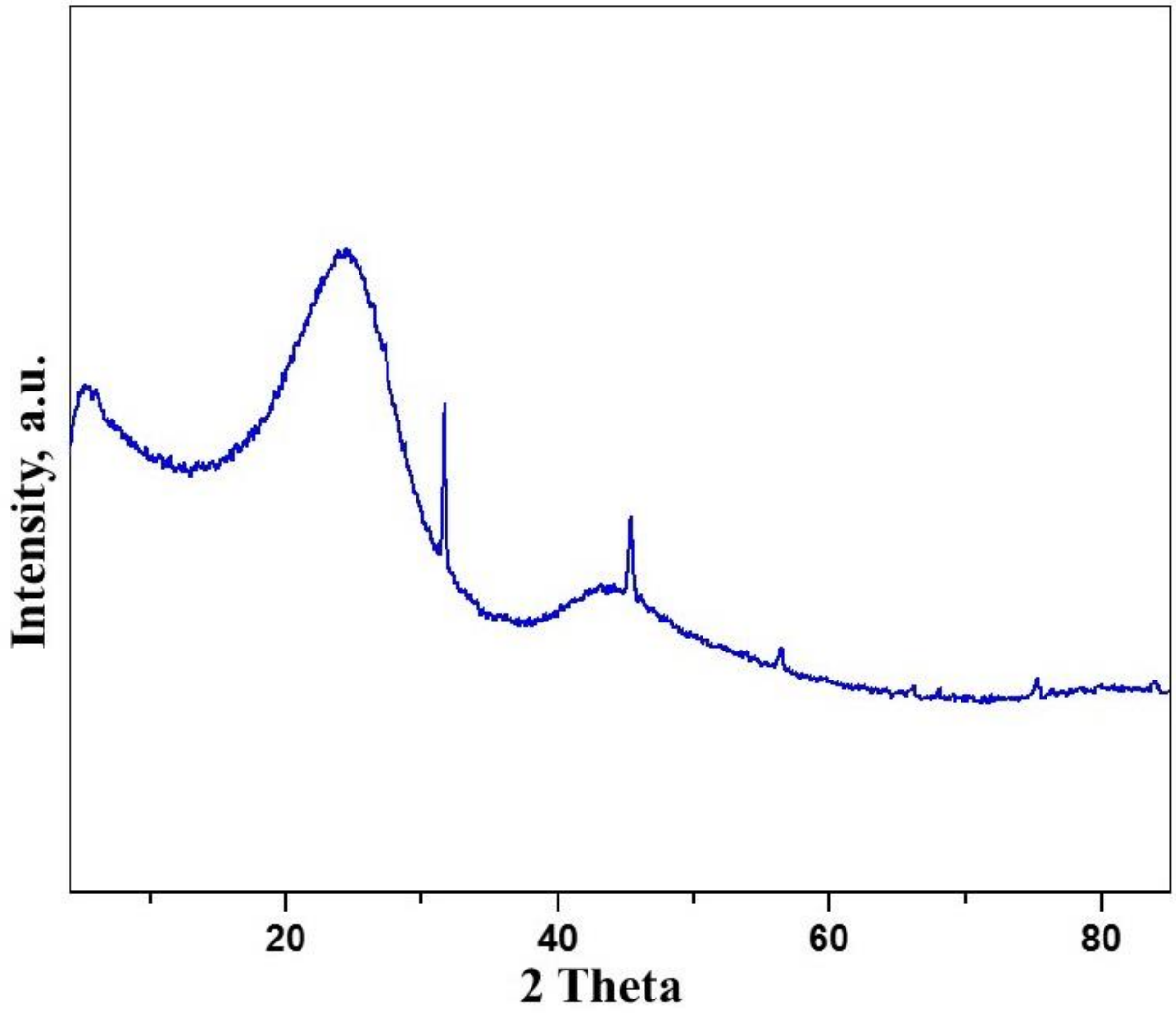
Procedure for the synthesis of chitosan-derived porous layered CN_X catalyst

Porous layered CN_X catalyst was prepared via carbonization of chitosan at 300 °C for 4 h at a heating rate of 5°C/min under a nitrogen atmosphere. After cooling down to room temperature, CN_X catalyst was obtained as a fine brown powder. The prepared porous layered CN_X catalyst was further characterized by scanning electron microscope (SEM), transmission electron microscopy (TEM), Brunauer–Emmett–Teller (BET) analysis, X-ray diffraction (XRD) analysis.

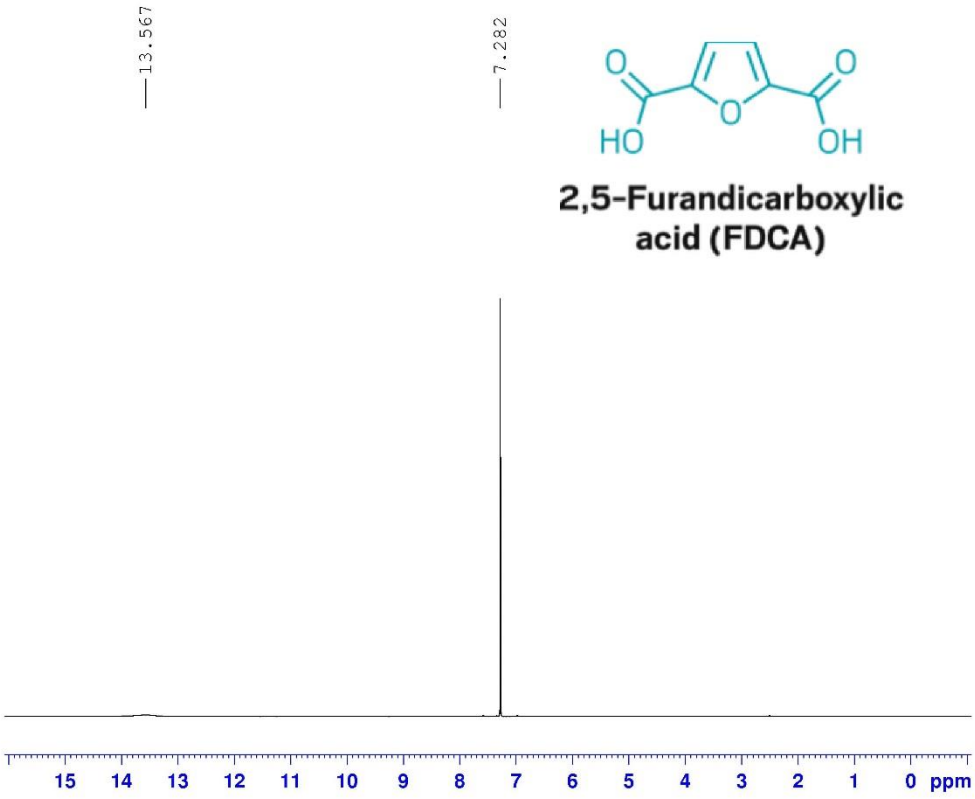
Procedure for the aerial oxidation of HMF to FDCA

A 25 mL three-neck round bottomed flask equipped with a magnetic stirring bar and a balloon filled with air was charged with 5-hydroxymethylfurfural (1.0 mmol), CN_X catalyst (25 mg), K_2CO_3 (1.0 mmol) and water (10 mL). The reaction mixture was heated at 70 ^oC for 36 hours. After 36 hours, the product was cooled to room temperature and the solution was filtered using vacuum filtration assembly fitted with membrane (0.47 μm pore size). The ensuing product was analyzed using NMR.

XRD analysis of recycled chitosan-derived porous layered CN_X catalyst



S1. XRD analysis of recycled chitosan derived porous layered CN_X catalyst



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SOLVENT	DMSO
NS	16
DS	2
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FIDRES	0.188846 Hz
AQ	2.6477852 sec
RG	181
DW	80.800 usec
DE	6.50 usec
TE	303.0 K
D1	1.00000000 sec
TD0	1
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PL1	3.20 dB
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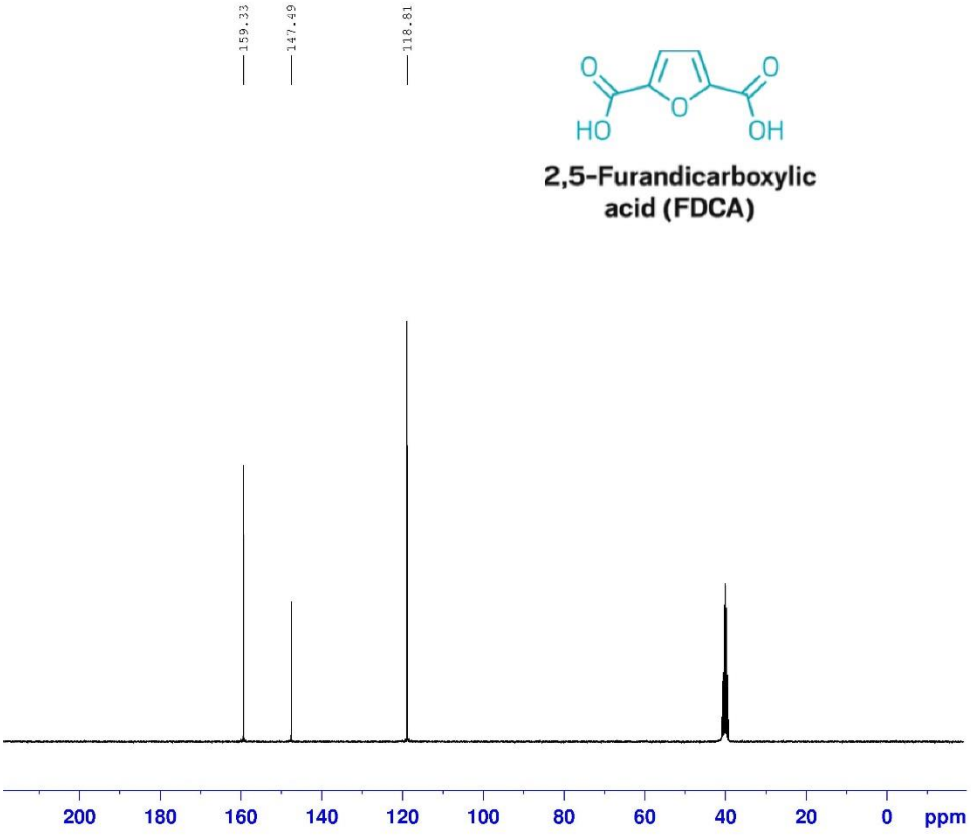
GB	0
PC	1.00



2,5-Furandicarboxylic acid (FDCA)

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TD	32768
SOLVENT	DMSO
NS	5000
DS	4
SWH	17985.611 Hz
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TE	303.0 K
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D11	0.03000000 sec
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PL1	1.80 dB
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PCPD2	80.00 usec
PL2	3.20 dB
PL12	18.98 dB
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PL12W	0.31768745 W
SFO2	300.1312005 MHz
SI	32768
SF	75.4677490 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40