

1 **Supplementary materials**

2 **S1. Methodology of copper coating on graphite electrodes**

3 1) The graphite electrode surfaces were cleaned with mild sodium hydroxide, 0.4 % (w/v) to  
4 remove the dust and stains.

5 2) The electrode surfaces were sensitised (Step1 electrode) by dipping in a bath solution  
6 containing stannous chloride ( $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$ ), 10 g/L and concentrated hydrochloric acid, 40  
7 mL/L.

8 3) Step 2: processed electrodes were then dipped in a solution mixture, consisting of silver  
9 nitrate (A) and formaldehyde (B) at the ratio of 5:1 (A: B). The concentrations of silver  
10 nitrate (A) and formaldehyde (B) were 120 g/L and 40 % (v/v) respectively.

11 4) Step 3: processed electrodes were initially dipped in the bath solution containing copper  
12 sulphate ( $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ), 75 g/L and concentrated sulphuric acid, 2.5 g/L. Then the electrodes  
13 were placed in the electro chemical cell (Potential, 5 V; Current, 1 A) containing copper  
14 sulphate ( $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ), 250 g/L and concentrated sulphuric acid, 40g/L.

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## 27 **S2. Preparation of mesoporous activated carbon (MAC)**

28       Mesoporous activated carbon (MAC) was prepared from rice husk by two stages  
29 process: (1) precarbonisation; (2) chemical activation. The precarbonisation of rice husk was  
30 carried out by combustion at 400 °C in a fully rice husk loaded crucible and closed with  
31 porcelain lid to avoid direct air contact, followed by chemical activation, using phosphoric  
32 acid at 800 °C in order to render mesoporous structure of activated carbon. The resulted  
33 material was sieved to 600µm size and several times washed with hot water to remove the  
34 excess phosphorus compounds. The washed MAC was dried at 110 °C for 6 h to obtain the  
35 final product, and labeled as MAC.

## 36 **S3. Characterisation of mesoporous activated carbon**

37       The C, H, N contents of the MAC were determined, using CHNS 1108 model Carlo-  
38 Erba analyzer. The pH of the point of zero charge, pHPZC i.e. the pH above which the total  
39 surface of carbon particles are negatively charged, was measured by the pH drift method. The  
40 surface area and pore size distribution were derived from the N<sub>2</sub> adsorption–desorption  
41 isotherms. The N<sub>2</sub> adsorption–desorption isotherms of MAC were measured, using Quanta  
42 chrome Corp. Nova-1000 gas sorption analyzer. Prior to measurement, MAC was degassed at  
43 150 °C overnight. The nitrogen adsorption–desorption data was recorded at liquid nitrogen  
44 temperature 77 K. The surface area was calculated using BET equation, which is the most  
45 widely used model for determining the specific surface area (m<sup>2</sup>/g).

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53 **Table S1: characteristics of MAC**

Parameters	Values
Carbon, %	45.4
Hydrogen, %	0.9
Nitrogen, %	0.1
Moisture content, %	5.2
Ash content, %	36.4
Bulk density, g/cc	0.52
Apparent density, g/cc	0.11
Average pore diameter, A°	11.43
Matter soluble in acid, %	4.35
Point of zero charge (PZC)	6.4
Decolorizing capacity, mg/g	44
Phenol number, mg/g	4.31
Ion exchange capacity, mg/g	0.062
Surface area, m <sup>2</sup> /g	220