

Boosting electrochemical performance of hematite nanorods via quenching-induced alkaline earth metal ion doping

Qin Chen ¹, Yanan Chong ², Mumin Rao ³, and Ming Su ^{2,*} Yongcai Qiu ^{2,*}

¹ Guangdong Architectural Design and Research Institute Co. Ltd., N0. 97, Liuhua Road, Liwan District, Guangzhou, 510010, China

² Guangdong Provincial Key Laboratory of Atmospheric Environment and Pollution Control, School of Environment and Energy, South China University of Technology, Guangzhou, 510006, China

³ Guangdong Energy Group Science and Technology Research Institute Co.,Ltd, Guangzhou, 511455, China

* Correspondence: 1029910558@qq.com; ycqiu@scut.edu.cn

Two pieces of 1 cm × 3 cm × 0.25 mm carbon cloth are used in the hydrothermal reaction. It can be seen in the SEM that it is composed of closely arranged carbon fibers interspersed vertically and horizontally.

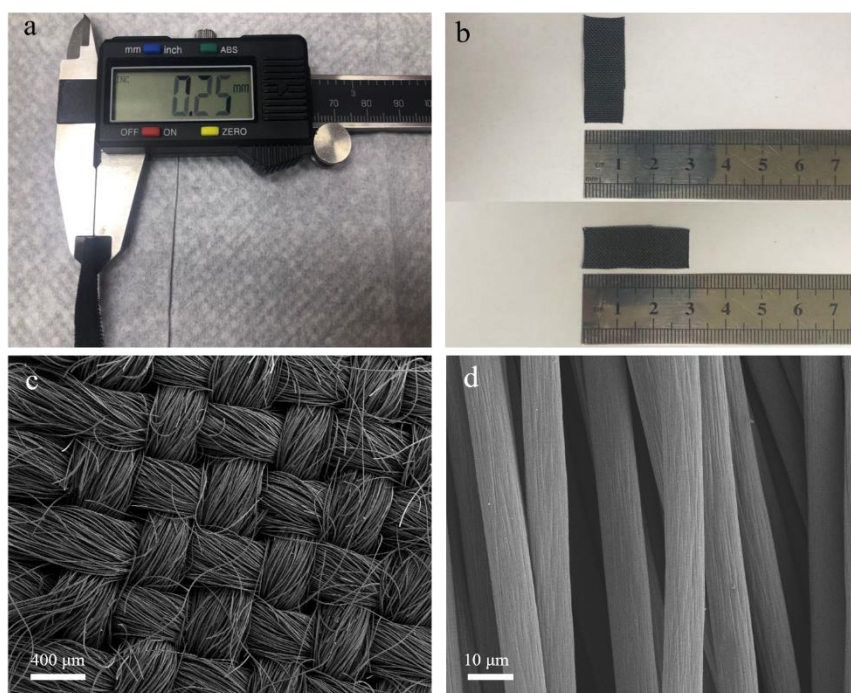


Figure S1. Digital photo of (a) the thickness (b) length and width of carbon cloth. (c, d) SEM images of carbon cloth in different magnifications.

We use heat-resistant tape to fix the carbon cloth on the PTFE rod.

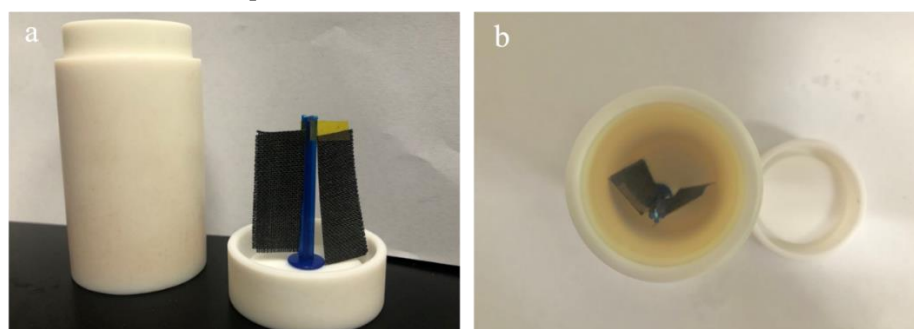


Figure S2. Schematic of hydrothermal reaction.

The electrochemical performance of the M-Fe₂O₃@CC was characterized using a Bio-logic electrochemical workstation. In half-cell tests, the electrochemical measurements were performed in a standard three-electrode cell with an aqueous 5 M LiCl solution as the electrolyte, a platinum foil as the counter electrode and a saturated calomel electrode (SCE) as the reference electrode. The working electrode consists of M-Fe₂O₃@CC (carbon cloth, 1.0 cm × 1.0 cm, Figure S3).

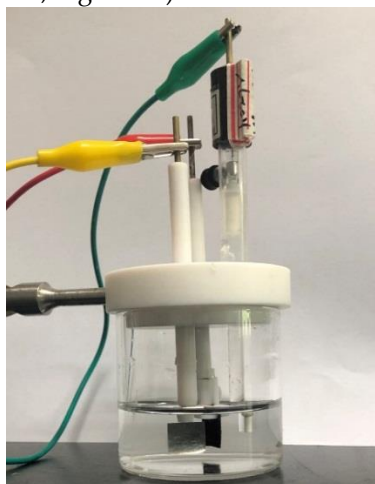
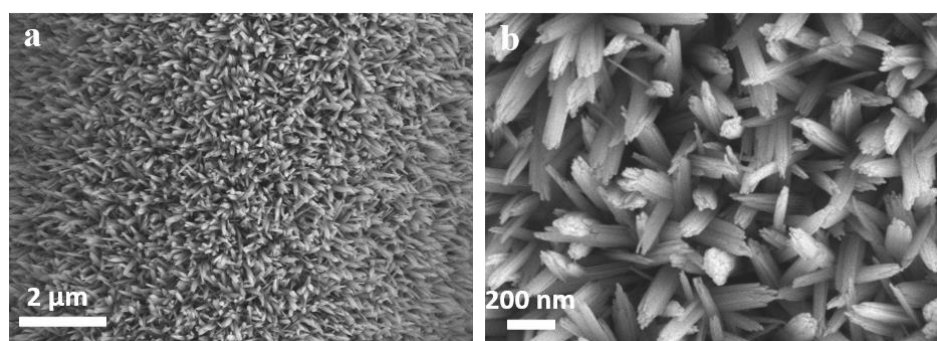
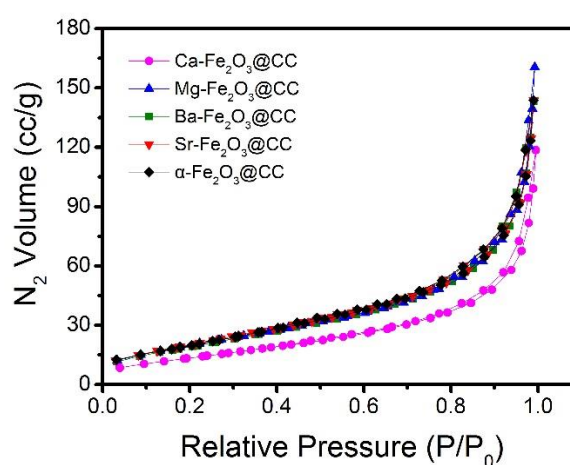
**Figure S3.** Schematic of three electrode test.**Figure S4.** SEM image of hematite supported on CC.

Figure S5. Nitrogen adsorption/desorption isotherms for α -Fe₂O₃@CC, Sr-Fe₂O₃@CC, Ba-Fe₂O₃@CC, Mg-Fe₂O₃@CC and Ca-Fe₂O₃@CC.