

# Agar Acts as Cathode Microskin to Extend the Cycling Life of Zn// $\alpha$ -MnO<sub>2</sub> Batteries

Linqing Zuo <sup>1</sup>, Haodong Sun <sup>1</sup>, Xinhai Yuan <sup>1</sup>, Juan Wen <sup>1</sup>, Xi Chen <sup>1</sup>, Shiyu Zhou <sup>1</sup>, Yuping Wu <sup>1,\*</sup> and Teunis van Ree <sup>2</sup>

<sup>1</sup> China State Key Laboratory of Materials-Oriented Chemical Engineering, Institute of Advanced Materials (IAM) & School of Energy Science and Engineering, Nanjing Tech University, Nanjing 210009, China; 201861122095@njtech.edu.cn (L.Z.); Sun-Haodong@njtech.edu.cn (H.S.); 15026765265@163.com (X.Y.); wenjuan@njtech.edu.cn (J.W.); chenxi@njtech.edu.cn (X.C.); 201961108012@njtech.edu.cn (S.Z.)

<sup>2</sup> Department of Chemistry, University of Venda, Thohoyandou 0950, South Africa; Teuns.VanRee@univen.ac.za

\* Correspondence: wuyup@fudan.edu.cn

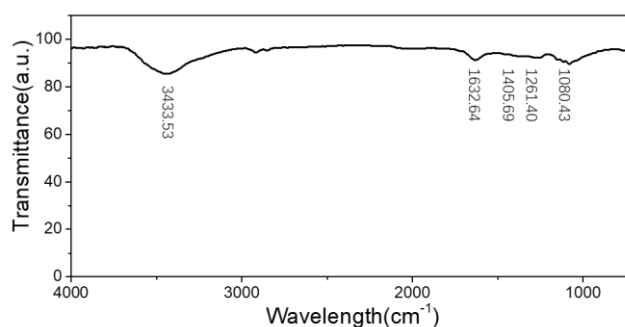


Figure S1. FTIR spectrum of agar/MnO<sub>2</sub>.

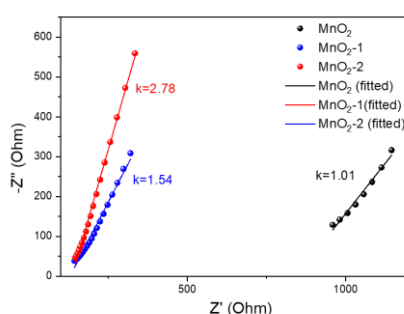
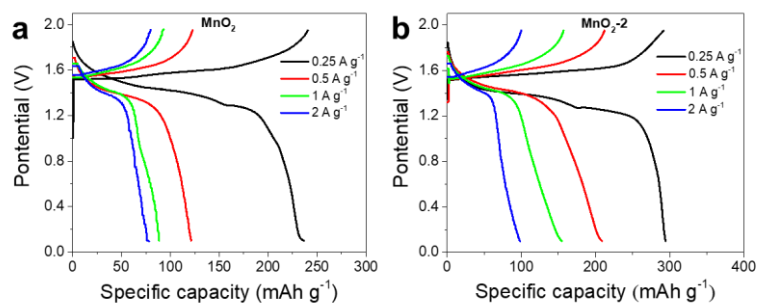
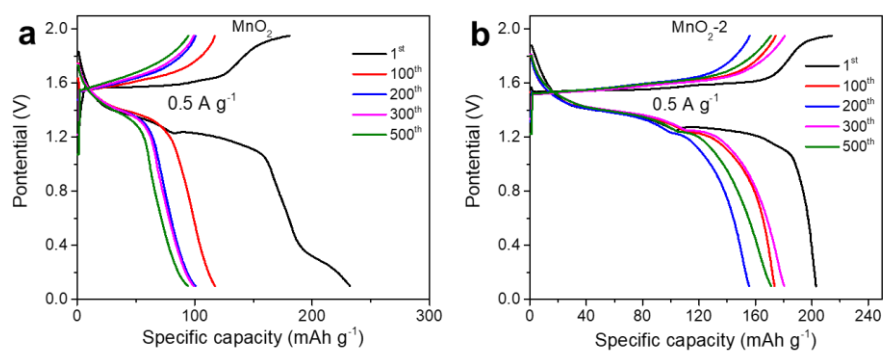


Figure S2. Fitting and calculation of slope in the EIS low frequency region of three batteries.



**Figure S3.** Electrochemical charge–discharge curves at different current densities over the potential range 0.1–1.95 V: (a) MnO<sub>2</sub>, (b) MnO<sub>2</sub>-2.



**Figure S4.** Electrochemical charge–discharge curves at a current density of 0.5 A g<sup>-1</sup> over the potential range 0.1–1.95 V: (a) MnO<sub>2</sub>, (b) MnO<sub>2</sub>-2.