# Electronic supplementary information

## Mesoporous $Mn_2O_3$/reduced graphene oxide (rGO) composite with enhanced electrochemical performance for Li-ion battery

Harsharaj S. Jadhav,[a] Gaurav M. Thorat,[a] Bharat B. Kale[b] and Jeong Gil Seo[a*]

[a]*Department of Energy Science and Technology, Energy and Environment Fusion Technology Center, Myongji University, Nam-dong, Cheoin-gu, Yongin-si, Republic of Korea.*

[b]*Centre for Materials for Electronic Technology(C-MET), under DeitY, Panchawati, Off Pashan Road, Pune 411008*, India

Corresponding author
**E-mail:** jgseo@mju.ac.kr
**Tel:** +82-31-324-1338

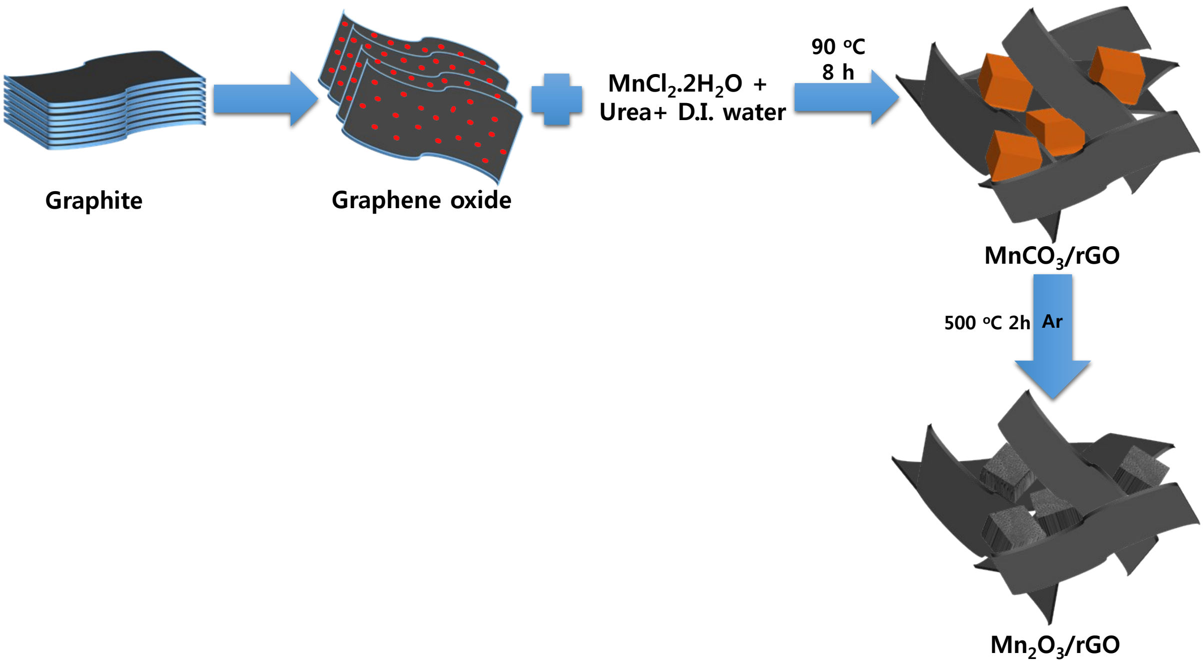


**Figure S1.** Schematic representation of synthesis of porous $Mn_2O_3$/rGO by chemical co-precipitation technique.

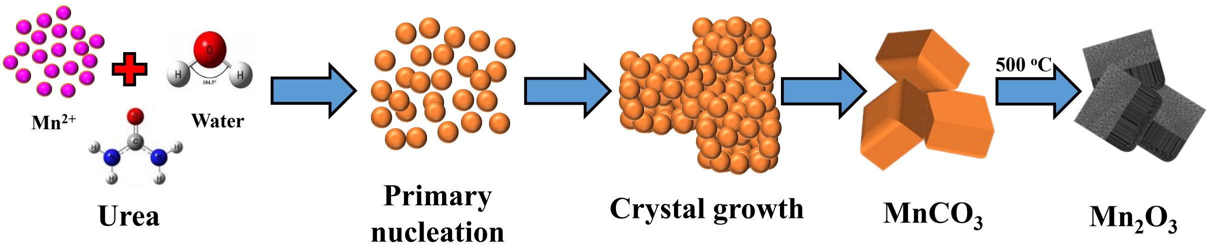


**Figure S2**. Illustration of growth mechanism of bare $Mn_2O_3$.

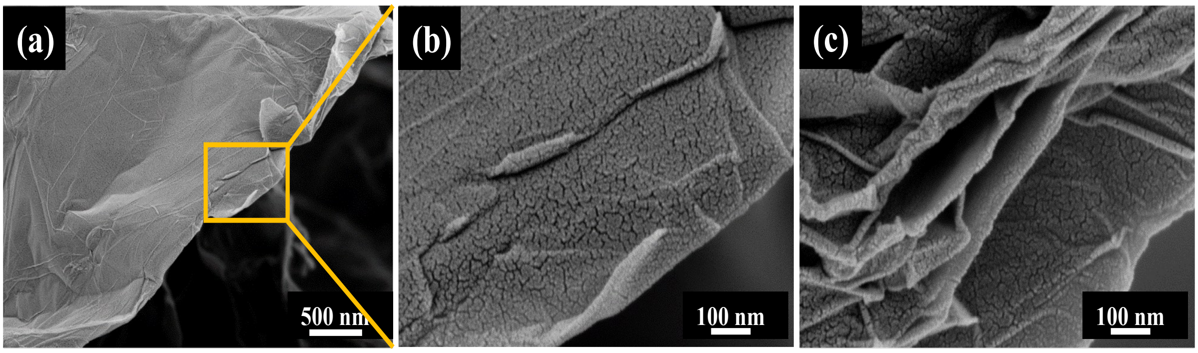


**Figure S3**. FE-SEM images of rGO at different magnifications.

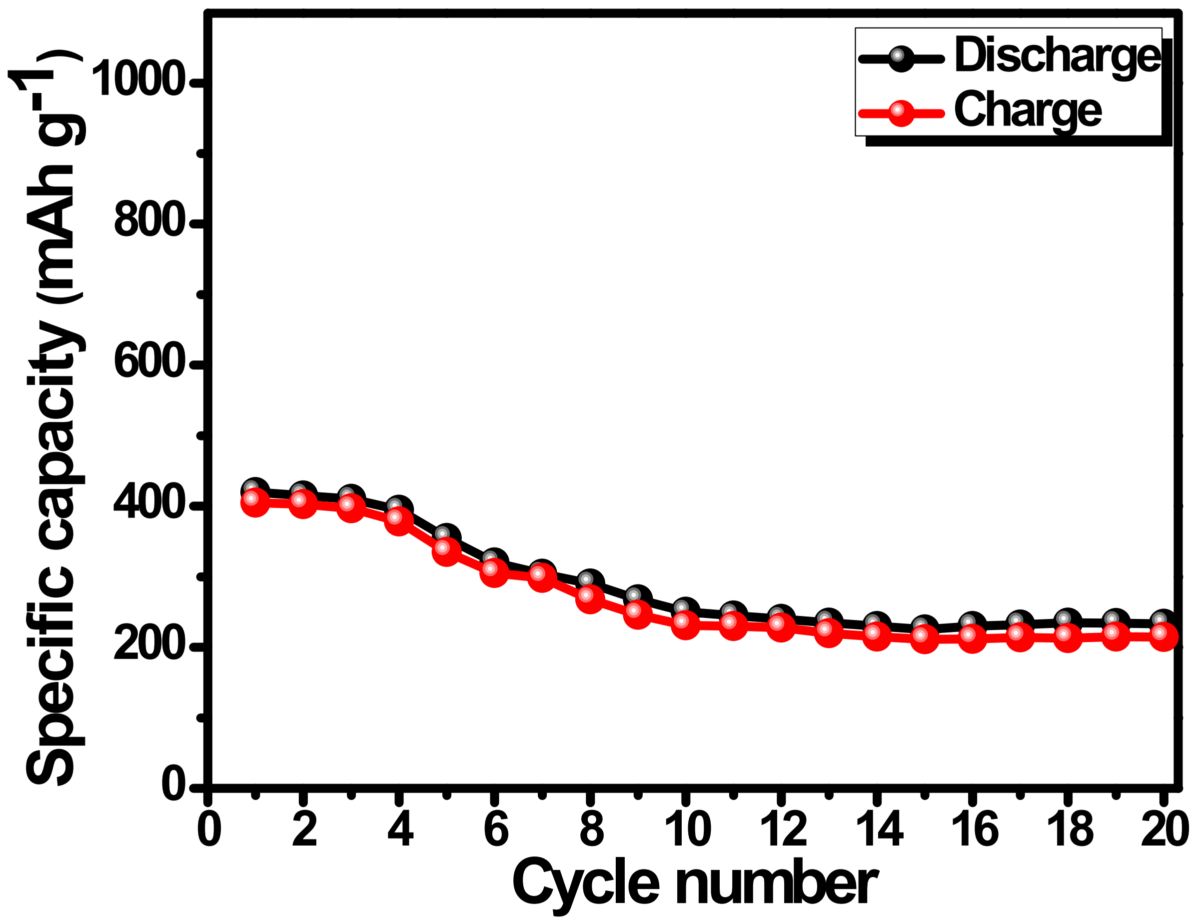


**Figure S4.** Electrochemical performance of rGO based electrode.

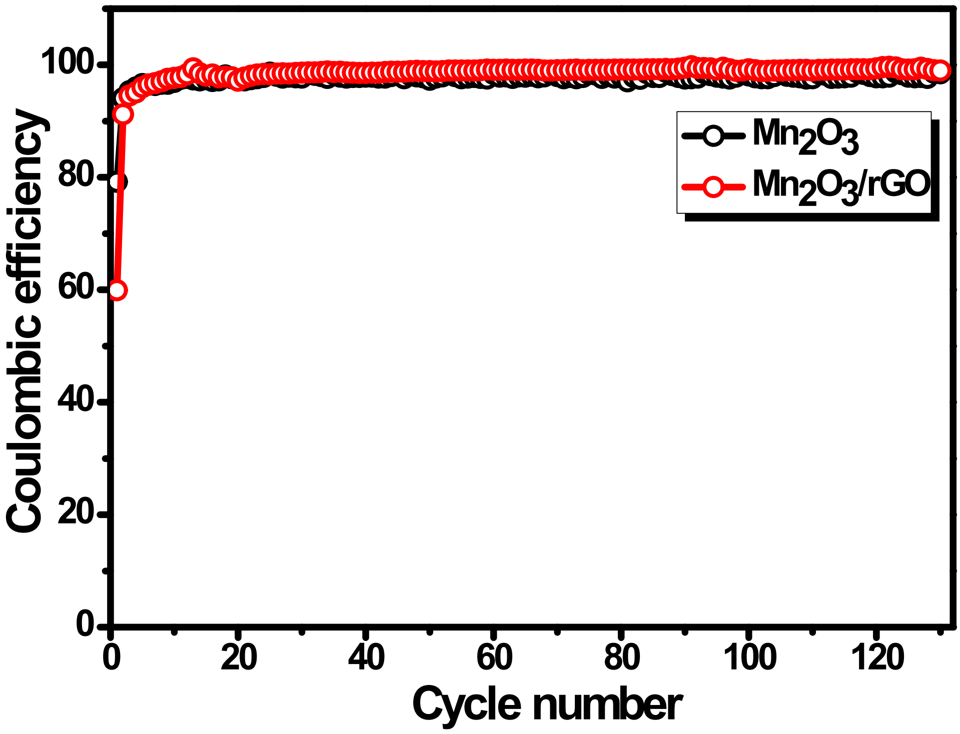


**Figure S5.** Coulombic efficiency of $Mn_2O_3$ and $Mn_2O_3$/rGO as a function of cycle number.

**Table S1**. Comparison of specific capacity of reported Mn-based and present work anodes

| **Material** | **Synthesis method** | **Specific capacity ($mA\ h\ g^{-1}$)** | **Cycles** | **Reference** |
|---|---|---|---|---|
| $Mn_3O_4$/graphene | Impregnation | 500 (60 mA $g^{-1}$) | 40 | 13 |
| $Mn_3O_4$ | Precipitation | 800 (0.25 C) | 40 | 19 |
| Cu doped $Mn_2O_3$ | Hydrothermal | 642 (100 mA $g^{-1}$) | 100 | 20 |
| $Mn_2O_3$/HHC composite | Co-precipitation | 806 (100 mA g-1) | 200 | 21 |
| $Mn_2O_3$ sheet-like structure | Hydrothermal | 521(300 mA $g^{-1}$) | 100 | 28 |
| $Mn_2O_3$ | Hydrothermal | 265( 200 mA $g^{-1}$) | 15 | 29 |
| $Mn_2O_3$ microspheres | Hydrothermal | 524( 200 mA $g^{-1}$) | 200 | 30 |
| $MnO_x$-C nanocomposite | Spray pyrolysis | 650(200 mA $g^{-1}$) | 130 | 31 |
| GS-$Mn_3O_4$ | Microwave assisted | 900(40 mA $g^{-1}$) | 50 | 32 |
| $Mn_3O_4$ hollow spheres | Aerosol spray pyrolysis | 980 (200 mA $g^{-1}$ ) | 140 | 33 |
| $Mn_2O_3$/rGO | Co-precipitation | 1015(230 mA $g^{-1}$) | 130 | Present work |

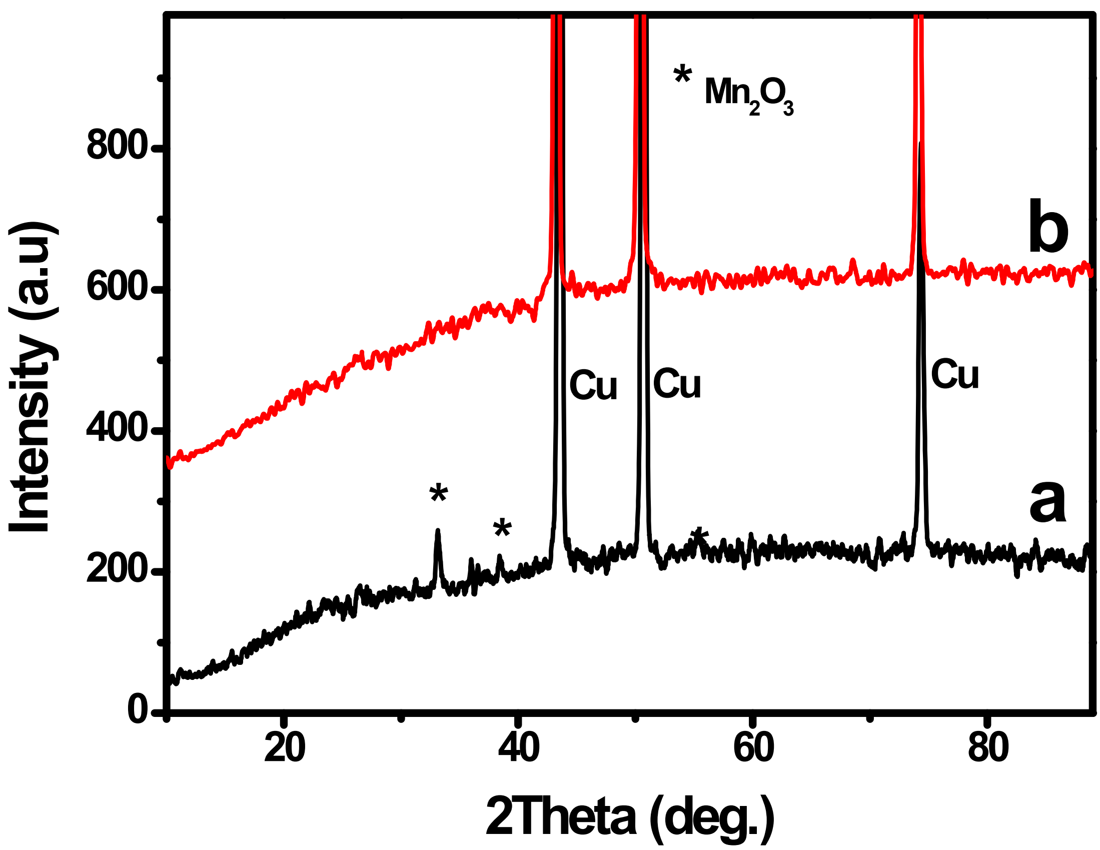


**Figure S6.** XRD pattern of $Mn_2O_3$/rGO electrode (a) before and after (b) 130 discharge/charge cycling test.

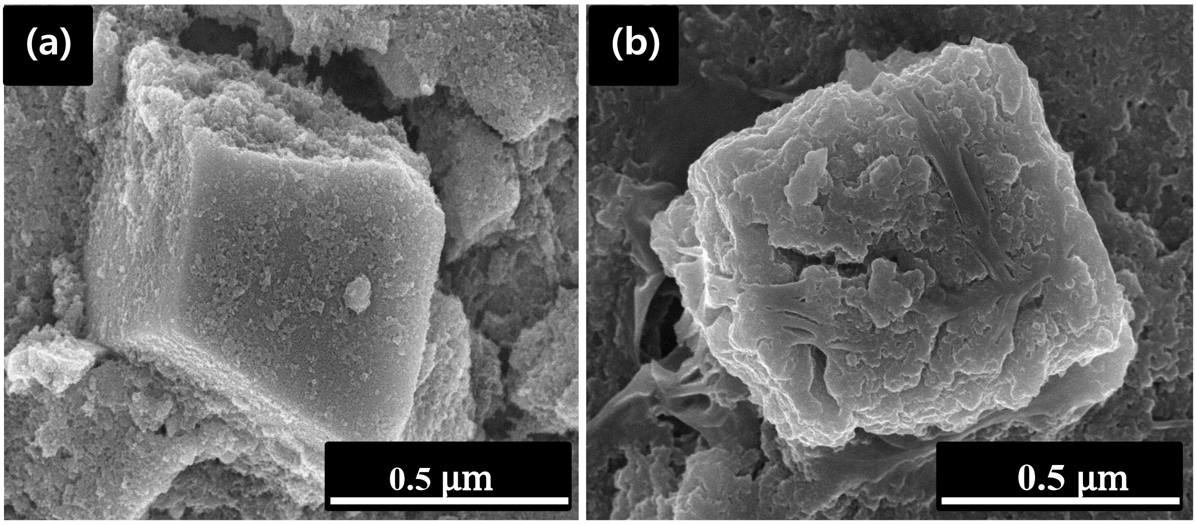


**Figure S7**. $Mn_2O_3$/rGO electrode analysis before and after cycling using FE-SEM.