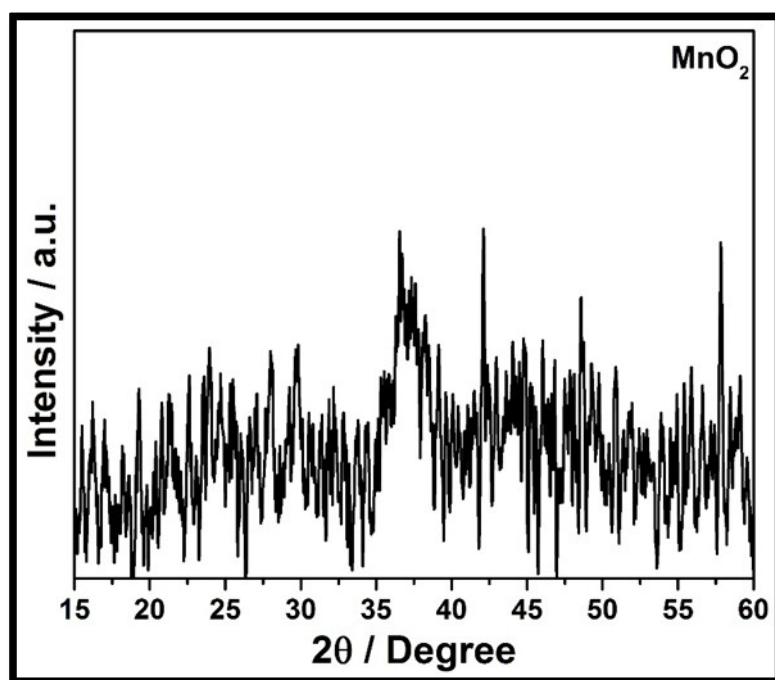


## Supplementary Information

### Low Cost Bio Derived Carbon Sprinkled Manganese Dioxide as an Efficient Sulfur Host for Lithium-Sulfur Battery

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*Fig. S1: XRD pattern of MnO<sub>2</sub>*

*Table S1: Carbon-MnO<sub>2</sub> composite synthesized via various methods have been used as cathode in Li-S system*

| Sl. No. | Material   | Specific capacity (mAh g <sup>-1</sup> ) | Cycle performance  | Coulombic efficiency (%) | Reference |
|---------|--|--|--|--------------------------|-----------|
| 1       | CNF-MnO <sub>2</sub> -Sulfur                     | 995 at 0.2C                              | 600 mAh g <sup>-1</sup> after 400 cycles at 1C                 | 99.66                    | 1         |
| 2       | Carbon-MnO <sub>2</sub> hollow nanofibers-Sulfur | 1248 at 0.1C                             | 0.050% capacity decay rate per cycle over 1000 cycles at 2.0 C | 98                       | 2         |

|    |  |                             |  |     |               |
|----|--|-----------------------------|--|-----|---------------|
| 3  | Core-shell $\gamma$ -MnO <sub>2</sub> -Sulfur  | 1350 at 0.1C                | Fade rate of 0.07% per cycle over 600 cycles at 1 C                | 95  | 3             |
| 4  | Dual Core-Shell-Structured S@C@MnO <sub>2</sub>  | 1345 at 0.1C                | Capacity decay rate of 0.052% per cycle after 1000 cycles at 3.0 C | 98  | 4             |
| 5  | 3D porous reduced graphene oxide/ultrathin MnO <sub>2</sub> nanosheets-S aerogel composite | 1360 at 0.1C                | Capacity decay of 0.092% over 200 cycles at 0.2C                   | 99  | 5             |
| 6  | Sulfur-MnO <sub>2</sub> @graphene  | 1416 at 0.1C                | 74% retention after 100 cycles at 0.2C                             |     | 6             |
| 7  | MnO <sub>2</sub> @hollow carbon boxes-   | 1042 at 1 A g <sup>-1</sup> | Stable over 500 cycles   | 100 | 7             |
| 8  | GF/MWMCNT/MnO <sub>2</sub>   | 1270 at 0.1C                | 824 mAh g <sup>-1</sup> was retained after 160 cycles              | 99  | 8             |
| 9  | Sulfur/manganese dioxide nanosheet   |                             | Capacity decay of 0.036%/cycle over 2,000 cycles                   | 98  | 9             |
| 10 | C-hemp/MnO <sub>2</sub> -Sulfur  | 926 at 0.1C                 | 74% retention over 100 cycles at 0.1 C                             | 91  | Present study |

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