**Supplementary Information**

# High Capacity Prismatic Type Layered Electrode with Anionic Redox Activity as an Efficient Cathode Material and PVdF/$SiO_2$ Composite Membrane for a Sodium Ion Battery

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## 1. Fig.S1- EDX spectra and Element Overlay-Mapping of the sample prepared via solid state reaction

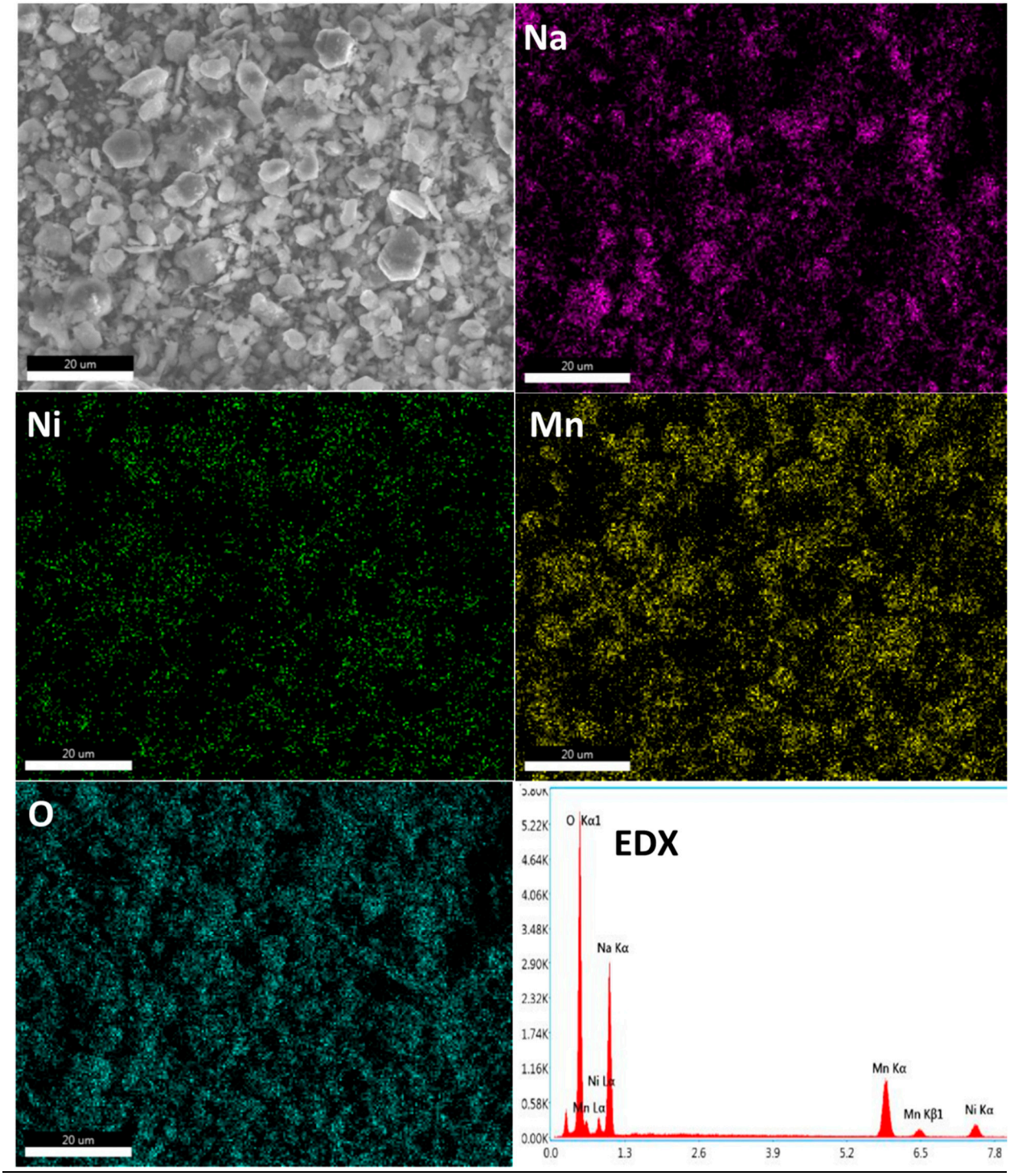


Fig.S1-shows the occurrence of elements of sample SSR sodium (Na), nickel (Ni), manganese (Mn), oxygen (O) respectively, and the EDX shows the presence of respective elements.

**2. Fig.S2- EDX spectra and Element Overlay-Mapping of the sample prepared via solid state reaction**

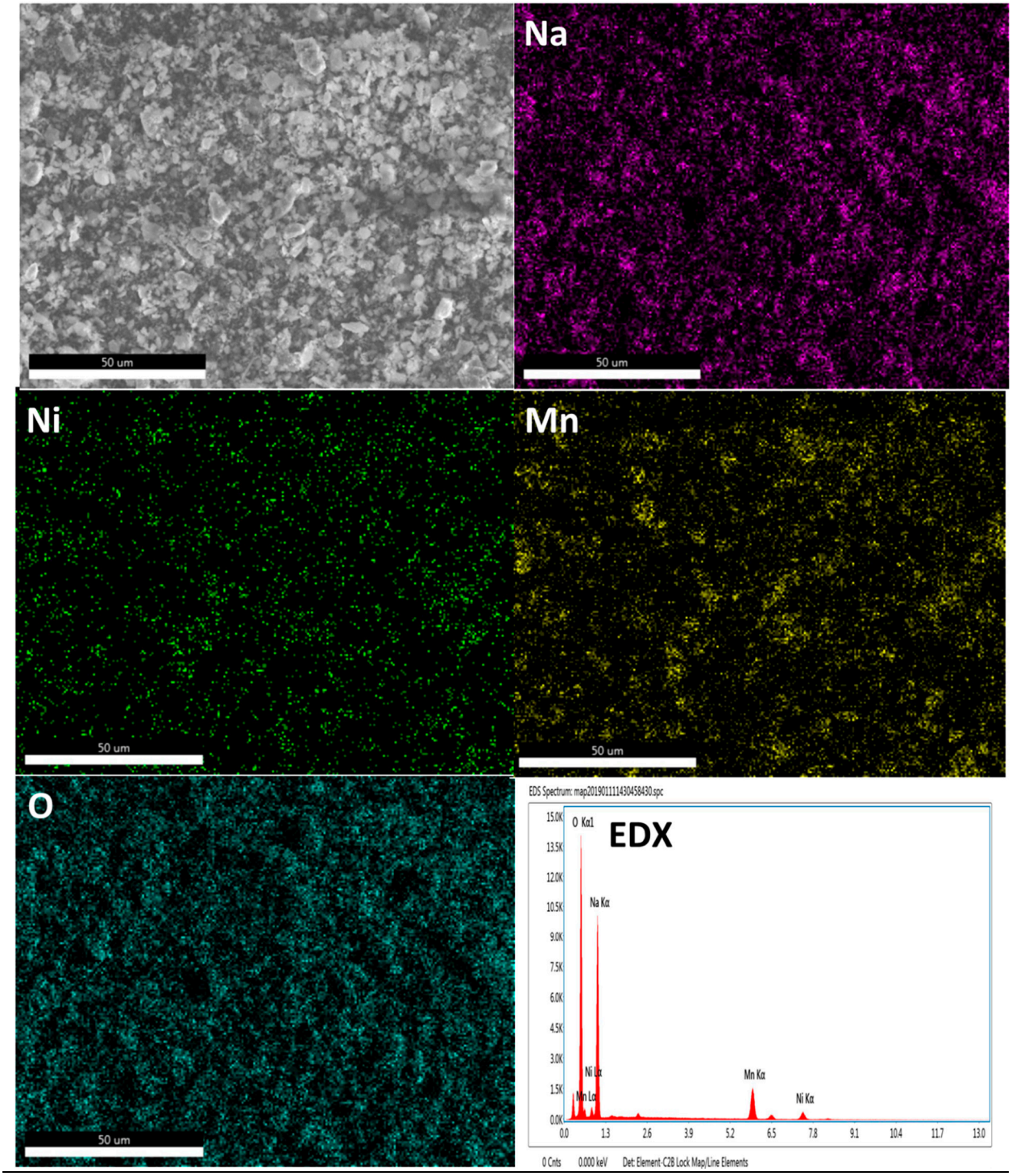


Fig.S2-shows the occurrence of elements of sample SGR sodium (Na), nickel (Ni), manganese (Mn), oxygen (O) respectively, and the EDX shows the presence of respective elements.

**3. Fig.S3. Scanning electron microscopic (SEM) images of prepared electrode**

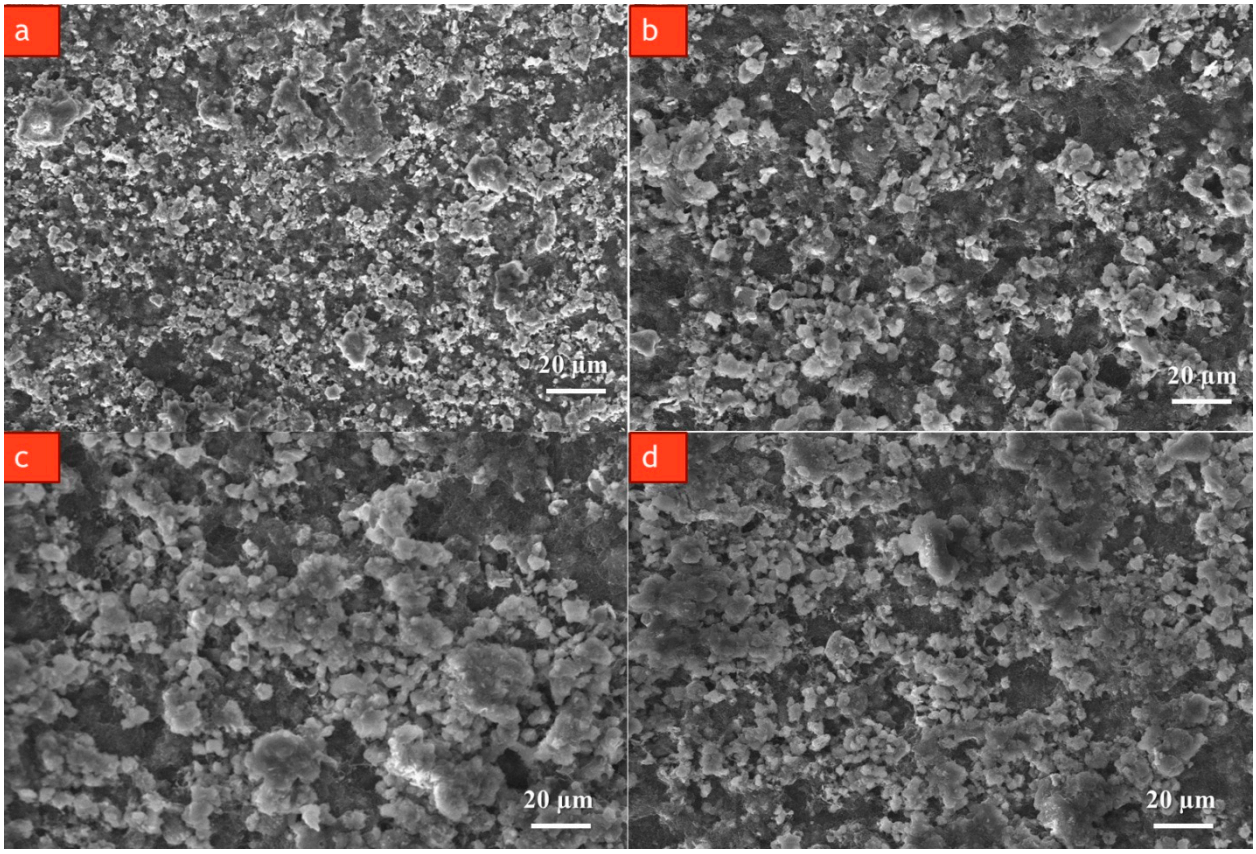


Fig.S3. (a-b) SEM images of electrode before charge discharge, (c-d) after charge discharge at scale of 20 µm

**4. Fig.S4. X-ray energy dispersive micro elemental analysis of electrode after charge discharge.**

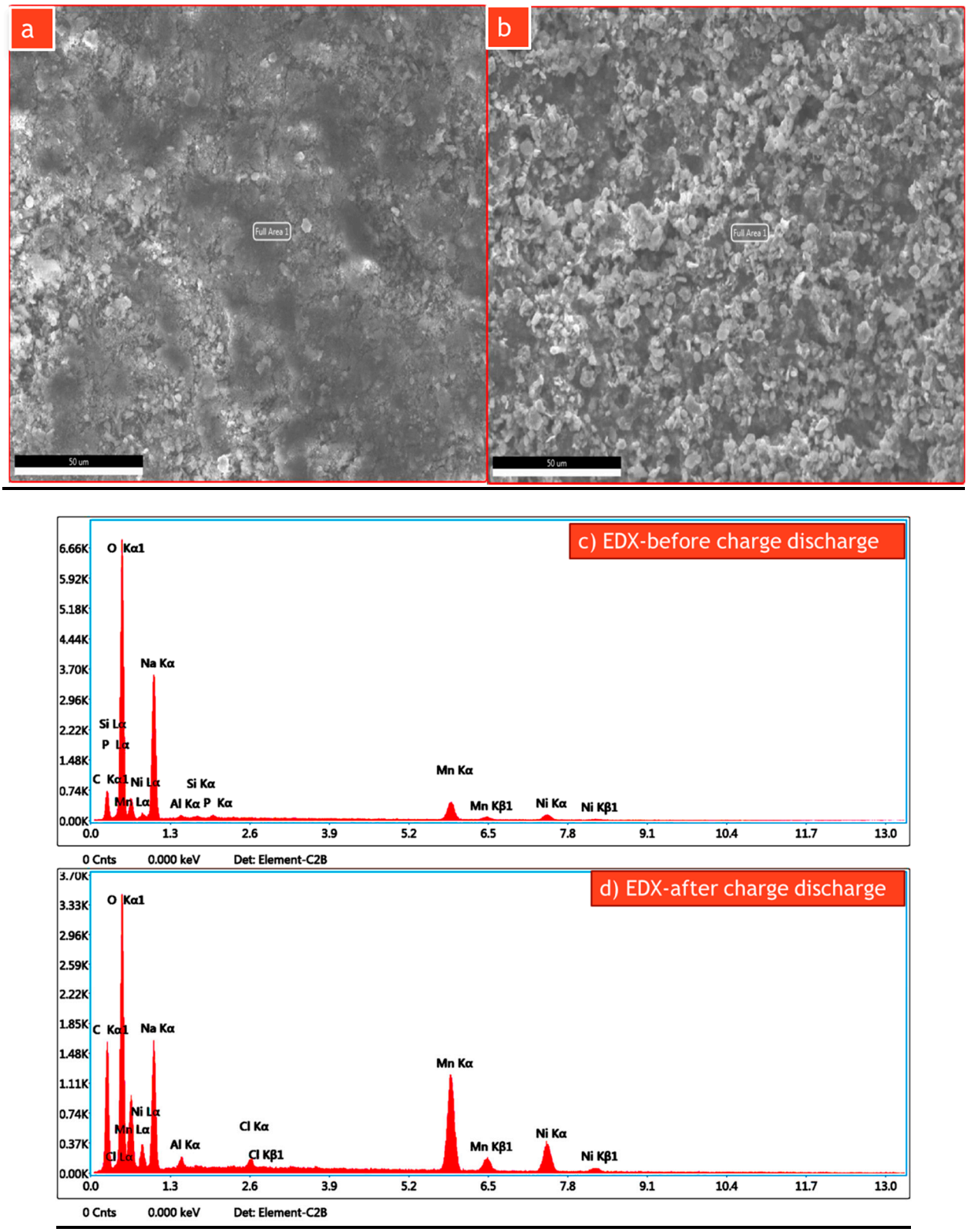


Fig.S4. (a, b) EDX- image of pristine and cycled electrode and (c, d) EDX spectra with presence of elements after charge discharge

**5. Table.T1. Summary of electrode elements before and after cycling and atomic loss of sodium (Na), oxygen (O) in electrode through EDAX.**

| Atomic %( Scanned Area of Electrode)-EDX Data | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Element** | **Pristine Electrode** | | | | | | **Cycled Electrode** | | | | | | **Atomic Loss In %** |
| | **Area 1** | **Area 1a** | **Area 2** | **Area 2a** | **Total** | **Average** | **Area 1** | **Area 1a** | **Area 2** | **Area 2a** | **Total** | **Average** | |
| **Oxygen** | 49.6 | 53.1 | 46.6 | 52.3 | 201.6 | 50.4 | 31.2 | 39.8 | 33.2 | 39.2 | 143.4 | 35.85 | 14.55 |
| **Sodium** | 26.0 | 41.0 | 25.7 | 39.7 | 132.4 | 33.1 | 14.5 | 39.5 | 14.6 | 38.2 | 106.8 | 26.7 | 6.4 |