Supplementary information for:

Enhanced cyclability using polyindole modified cathode material for lithium sulphur battery

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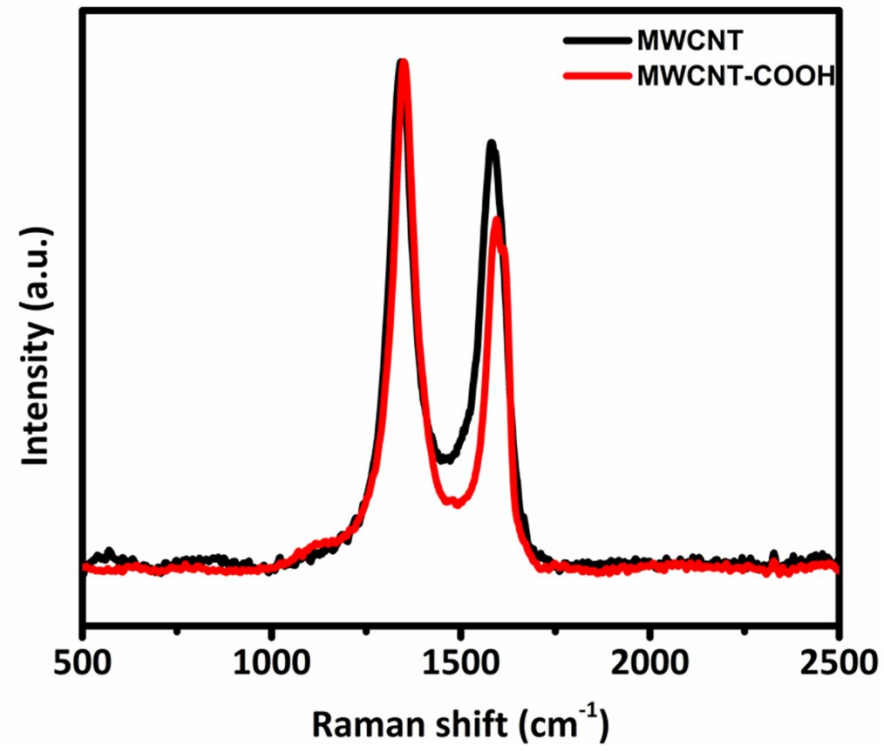

Figure S1. Raman spectrum for MWCNT and functionalised MWCNT

Figure S1. shows Raman spectrum of MWCNT and functionalised MWCNT. It contains two bands one band at 1345cm^{-1} called D band or disordered band and at 1549cm^{-1} called G band or graphitic band. It is observed that the G band intensity is reduced after chemical modifications of MWCNT. It is a clear evidence for the presence of carboxylic group on the surface of carbon nanotube.

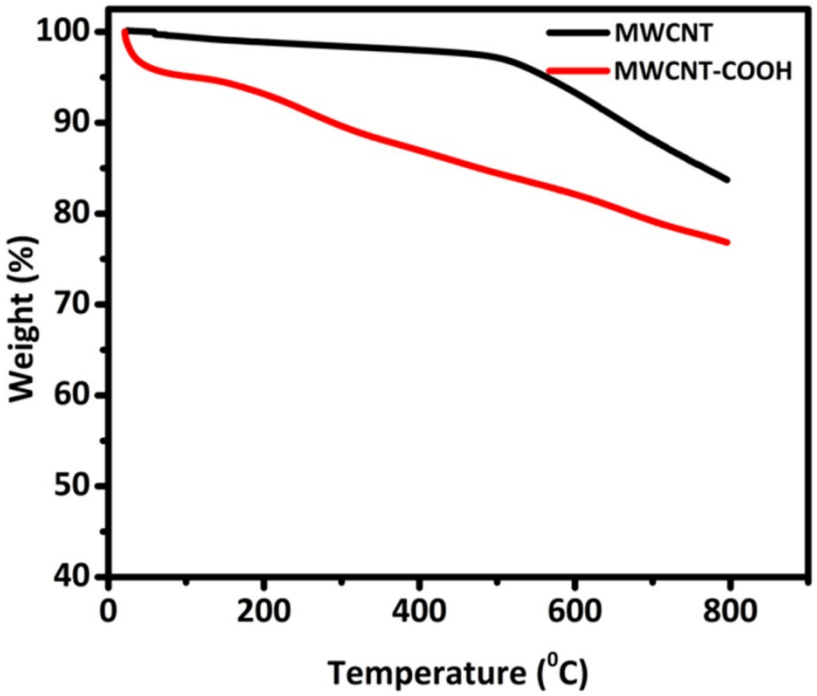

Figure S2. TGA for MWCNT and functionalised MWCNT

Figure S2. shows TGA profile for MWCNT and carboxylated MWCNT. Both display identical profile. Carboxylated carbon nanotube has less thermal stability than pristine MWCNT. A decomposition is observed below 100 ^{o}C is due to the elimination of water in the sample. A sharp decomposition is observed in the case of carboxylated carbon nanotube in the temperature range 130 ^{o}C to 350 ^{o}C is an evidence for the presence of carboxylic acid on the surface of MWCNT.

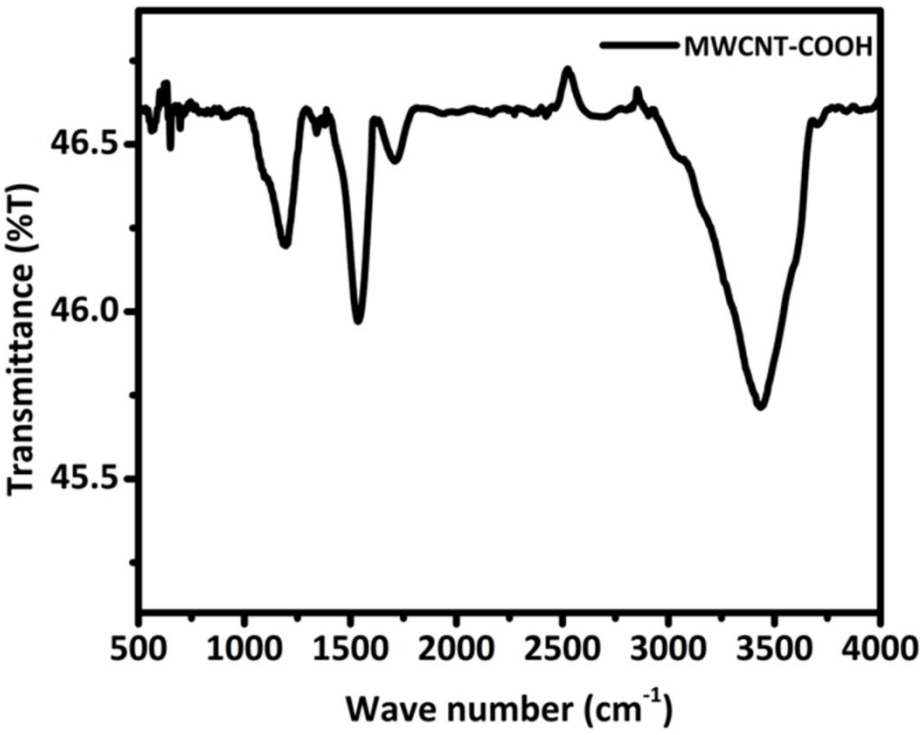

Figure S3. IR spectrum of functionalised MWCNT

Figure S3. shows the IR spectrum for the carboxylated MWCNT. The peak at 1722cm^{-1} is due to the carbonyl stretching in the carboxylic acid. It confirms the presence of carboxylic acid over the surface of MWCNT.

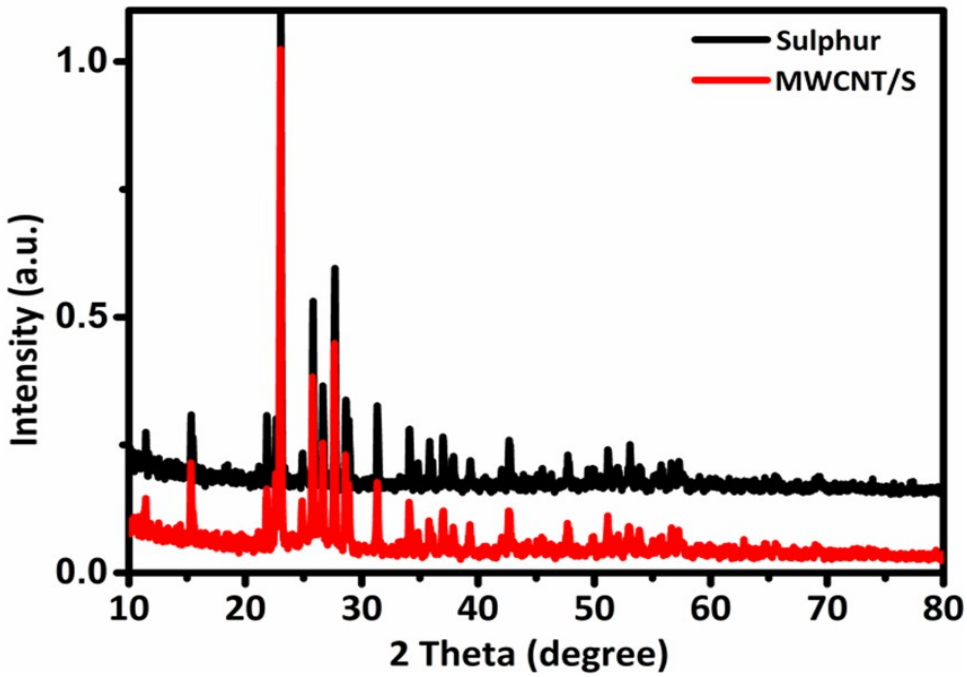

Figure S4. XRD pattern for sulphur and MWCNT/S

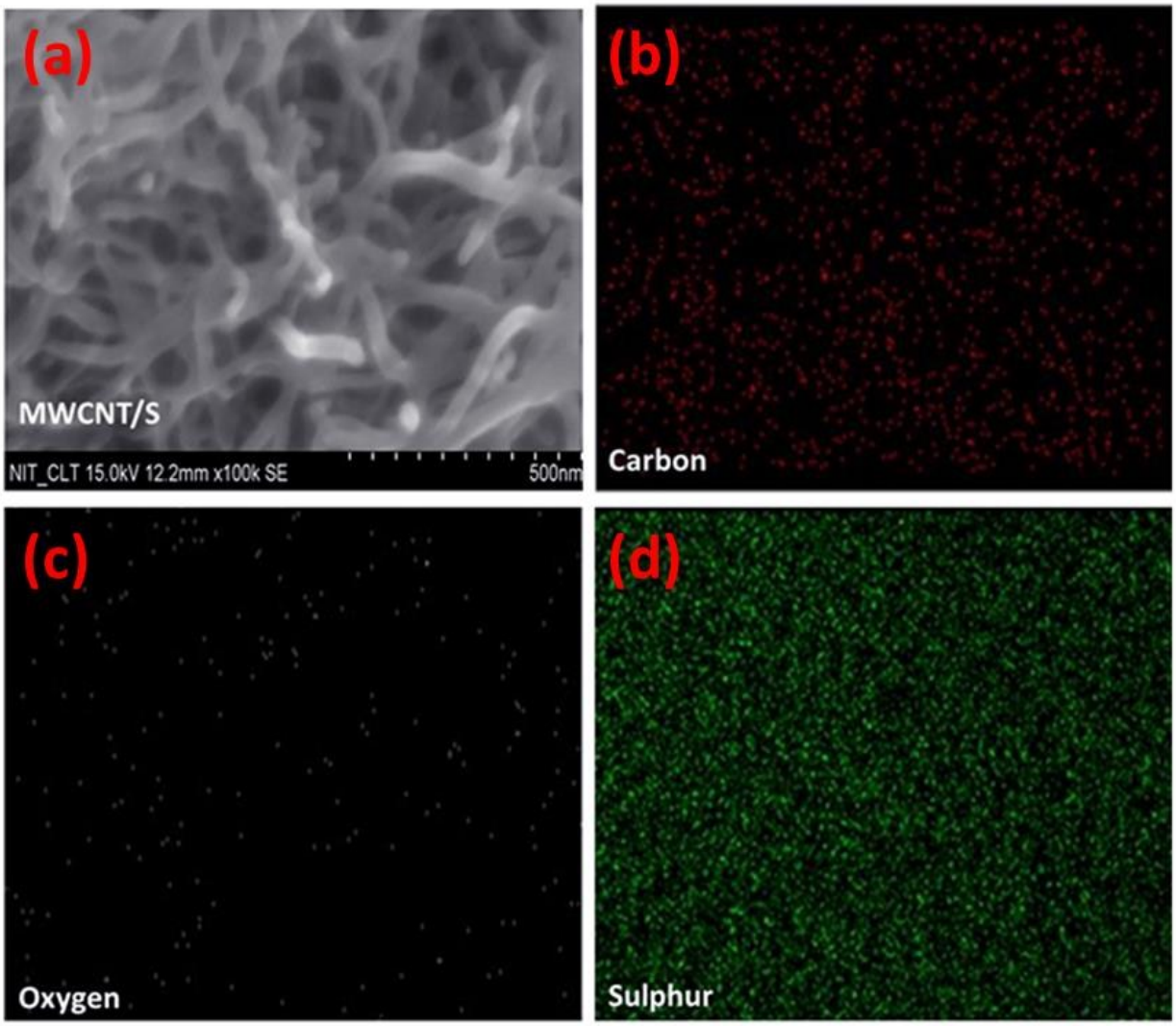

Figure S5. SEM images of (a) MWCNT/S and (b-d) its elemental mapping

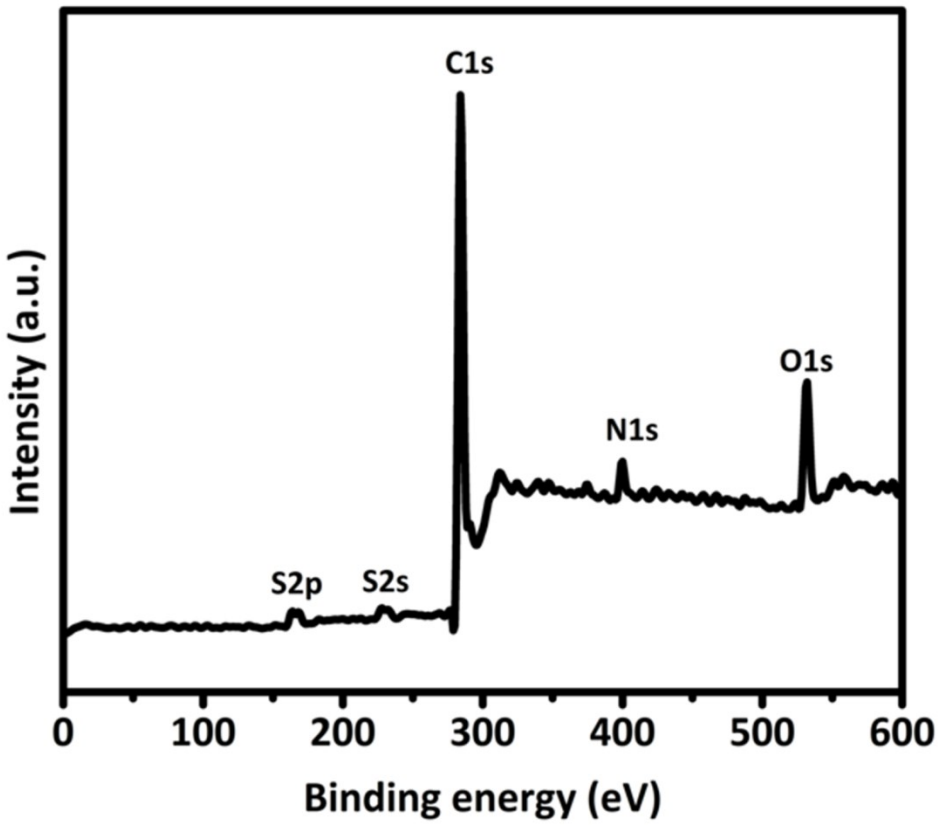

Figure S6. Survey scan of MWCNT/S/PIN

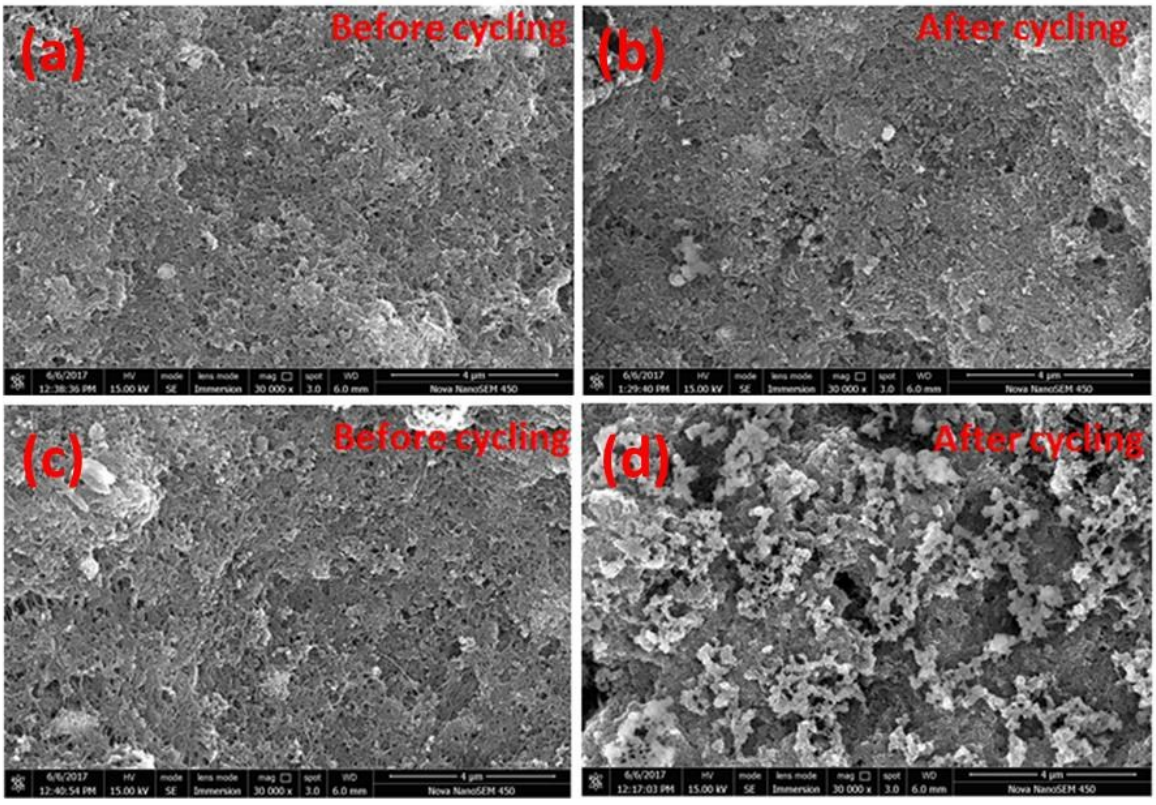

Figure S7. SEM images of (a) MWCNT/S/PIN before cycling (b) MWCNT/S/PIN after cycling (c) MWCNT/S before cycling and (d) MWCNT/S after cycling