Supporting Information

to

Structure-Related Electrochemistry of Sulfur-Poly(acrylonitrile) Composite

Cathode Materials for Rechargeable Lithium Batteries

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Figure S1. RAMAN spectrum of SPAN, cPAN and ScPAN. The intense signals around 1330 and 1560 cm^{-1} are assigned to the graphite D and G mode, those at 307 cm^{-1} , 379 cm^{-1} , 472 cm^{-1} and 929 cm^{-1} are attributable to S-S deformation and stretch vibrations.

Figure S2. XRD spectrum of SPAN, lacking any signals for elemental sulfur.

Figure S3. Voltage profile of the 1st discharge for a cell having a sulfur content of a) 48 wt.-% and b) 42 wt.-%, respectively. Composite content in the cathode was 70 wt.-%, cycling was carried out against lithium metal at C/10.

Figure S4. SEM pictures of a fresh (left) and a recharged (right) cathode (in ethers). No larger S_8 aggregates are visible, suggesting a fine dispersion of S_8 throughout the entire electrode.

Figure S5. XRD of a discharged cathode in a mixture of carbonates. The signals at $2\theta=37$, 44.5, 65 and 78 and 82 marked in red correspond to aluminum.