Supporting Information

Triphenylamine-contained multiporous polyimide: Its preparation and application as anode for lithium ion storage

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1. FTIR of $TCPA_2$ monomer

Figure S1 is the infrared absorption spectra of tri (4-aminophenyl) amine (TATA). The absorption peak at 829 cm^{-1} represents the para-substitution of benzene ring. The stretching vibration peak of C-N bond is at 1331 cm^{-1}. The absorption peaks at 1502 cm^{-1} and 1618 cm^{-1} are assigned to the stretching vibration peak of aromatic ring skeleton C=C. The C-H stretching vibration peak of benzene ring is occurred at 3031 cm^{-1}. And the absorption at 3336 cm^{-1} belongs to the N-H symmetrical stretching vibration peak of primary amine. While the peak of N-H asymmetric stretching vibration of aromatic primary amine locates at 3406 cm^{-1}. In general, the monomer tri (4-aminophenyl) amine (TATA) has been successfully synthesized.

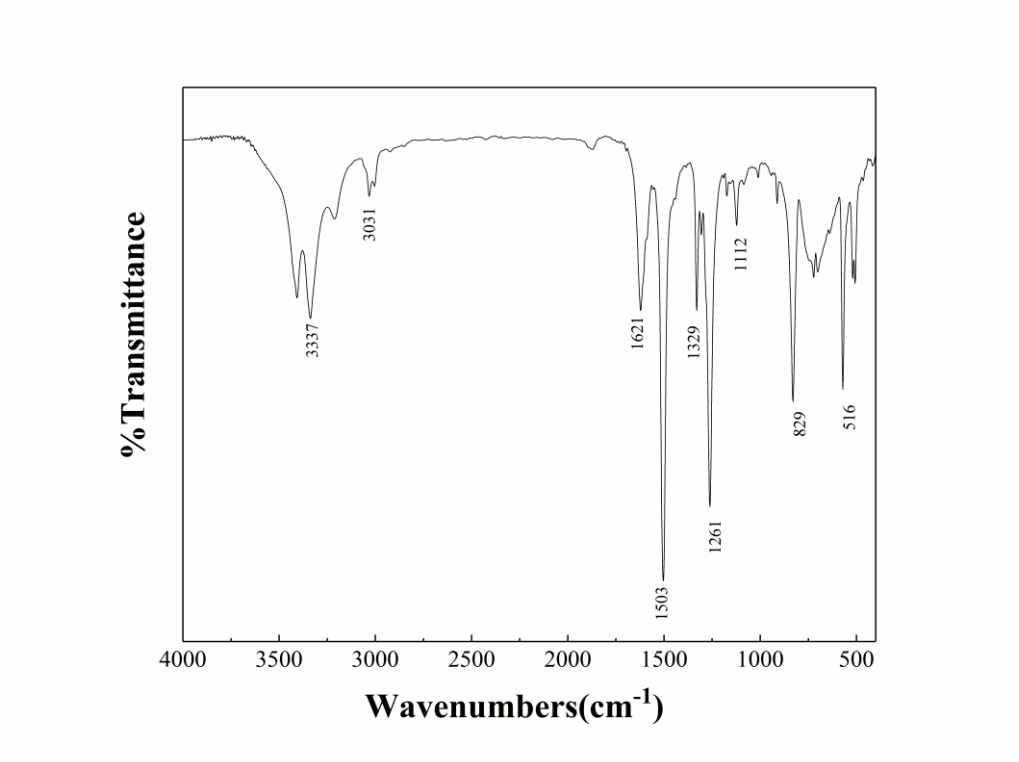

Figure S1. The FTIR figure of $TCPA_2$

2. ^1H NMR of $TCPA_2$ monomer

In order to confirm the successful synthesis of tri (4-aminophenyl) amine (TATA), ^{1}H NMR of TATA monomer was measured using DMSO as a solvent, and the results are shown in the following Figure S2. As shown, the chemical shift at 2.49 ppm belongs to the deuterium atom of DMSO (solvent) and the chemical shift is 3.33 ppm is due to the hydrogen atom of slightly water in the sample. The remaining two groups of peaks belong to the hydrogen atom peaks of TATA itself. The multiple peaks at 6.58 and 6.56 ppm belongs to the hydrogen of the ortho-position and para-position of the benzene, which contains six hydrogen atoms, respectively. The multiple peaks at 4.70 ppm belongs to hydrogen of the amino-groups, which contains six hydrogen atoms. After the integration of the three groups of peaks between 4 and 7 ppm, the ratio of the peak areas was found to be 1:1:1, corresponding to hydrogen atoms on the amino-groups, hydrogen atoms in the ortho-position of the benzene ring, and hydrogen atoms in the meta-position of the benzene ring, respectively. This is completely consistent with the ratio of three different structural hydrogen atoms of TATA itself. These results indicate that the TATA monomer has been successfully synthesized. ^{1}H NMR (400MHz, DMSO, ppm): 6.84 (m, 6H, Ar-H), 6.57 (m, 6H, Ar-H), 4.72 (m, 6H, -NH_2).

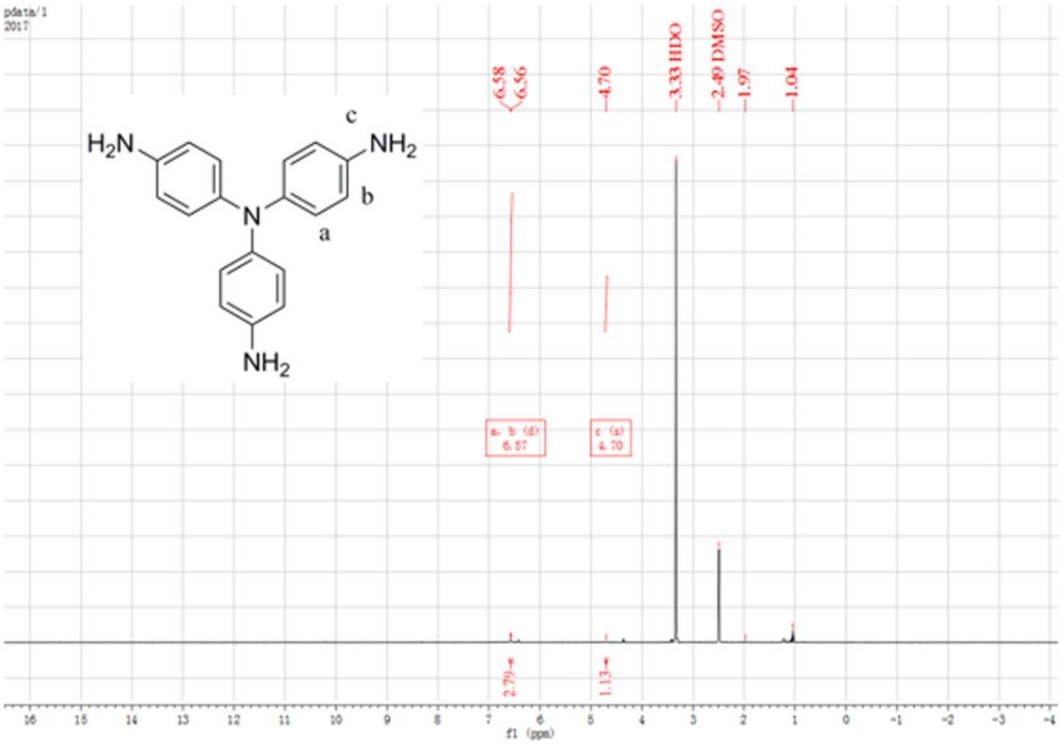

Figure S2. The ^{1}H NMR figure of $TCPA_2$