Electronic Supplementary Material

A typical synthetic process of PIL-Cl

Phthalic anhydride, glycol and ECH were dissolved mixed in DMF, and then stirred at 100 ℃ for 10 h under nitrogen atmosphere. The mixture was cooled to room temperature and poured into distilled water. The precipitate was washed by distilled three times and dried in vacuum at 70 ℃ for 24 h, obtaining light brown product PEP. PEP was dissolved in DMF and N-methylimidazole was added slowly, string at 90 ℃ for 4 days under nitrogen atmosphere. The mixture was poured into excess acetone and precipitate was wash with acetone, dried in vacuum and named PIL-Cl.

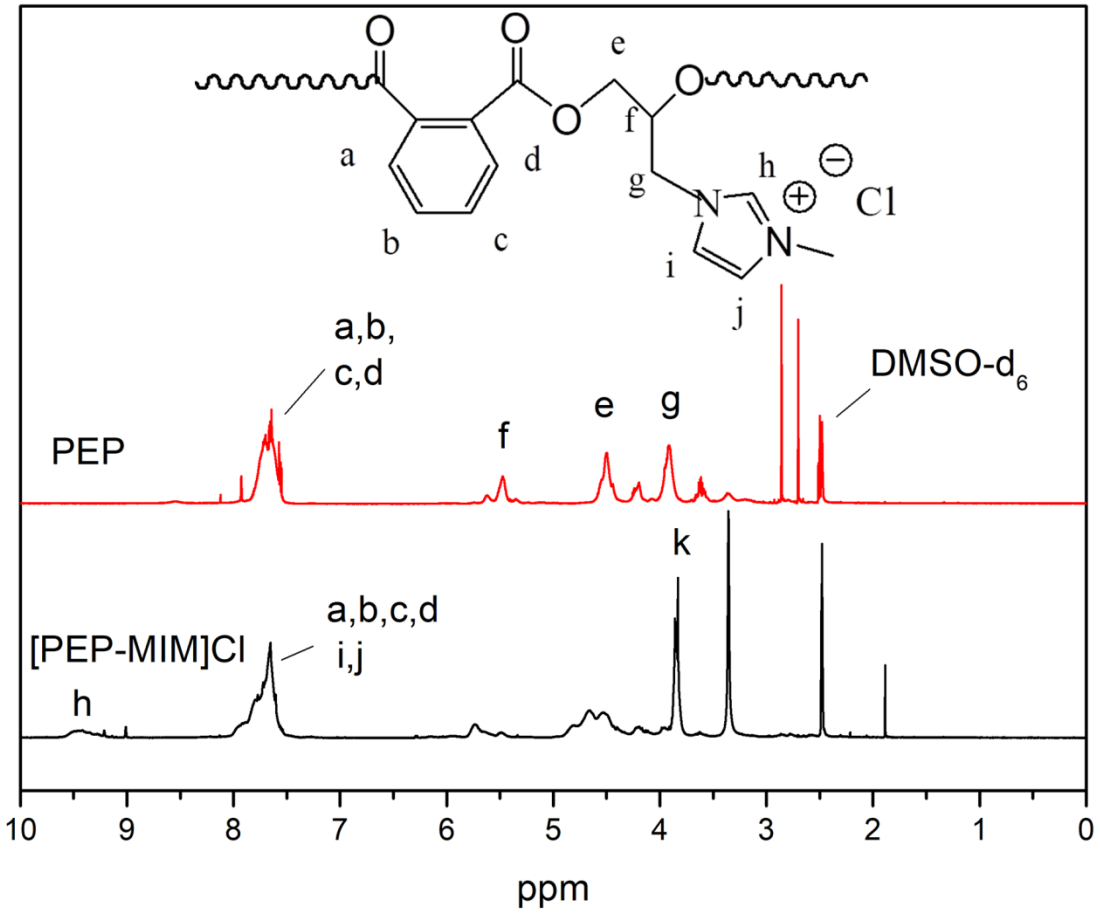

Fig. S1. ^{1}H NMR spectra of PEP and PIL-Cl.

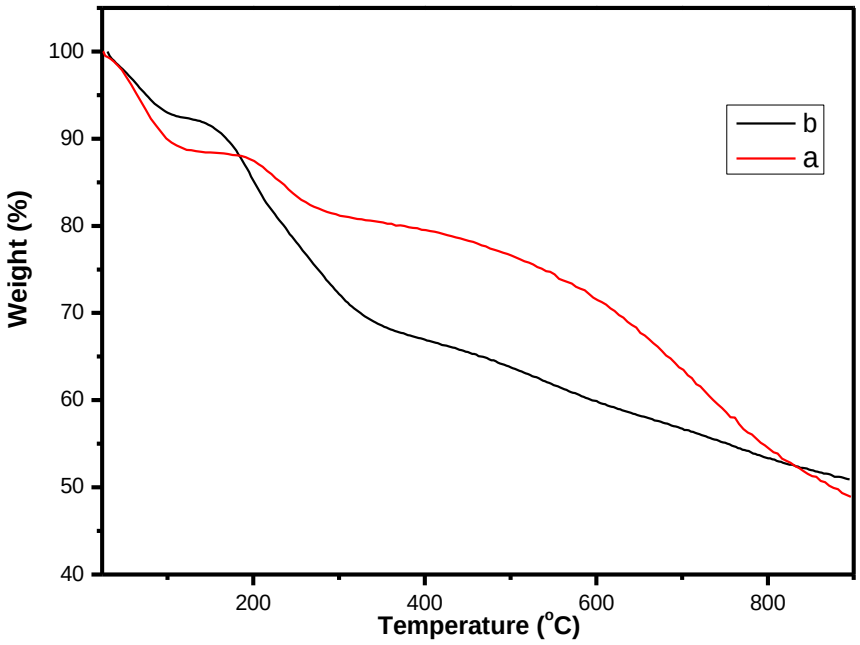

Fig. S2. TG curves of (a) the pure PANI, (b) PANIPIL-G

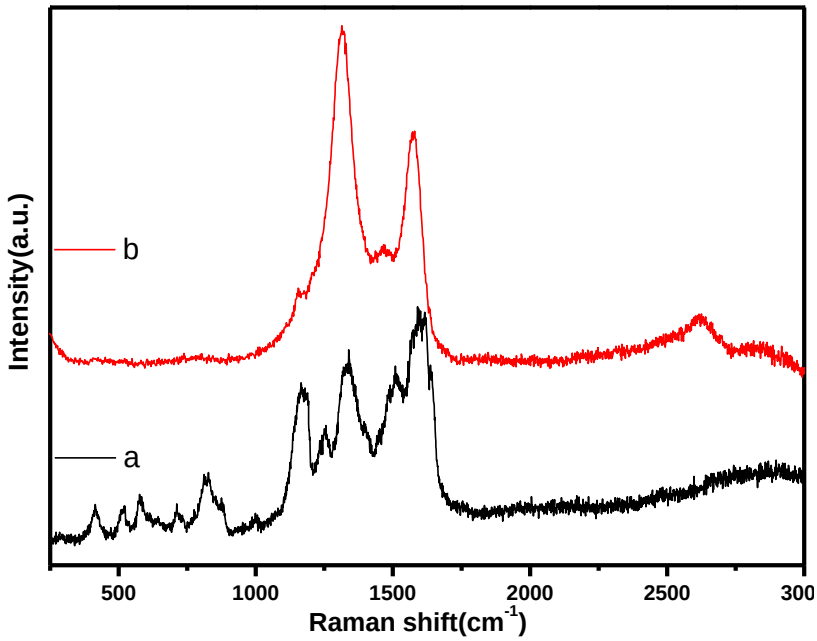

Fig. S3. Raman spectroscopy of (a) the pure PANI, (b) PANIPIL-G

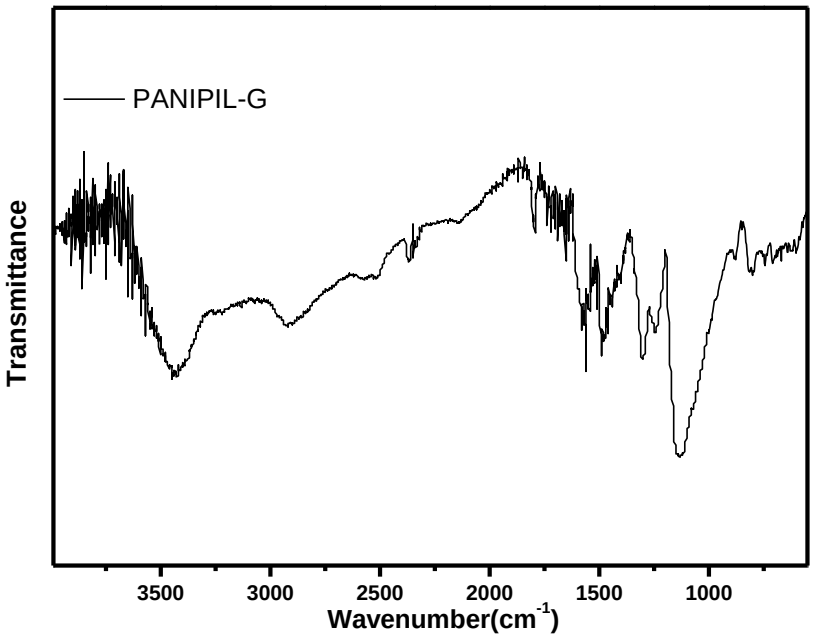

Fig. S4. FTIR spectroscopy of PANIPIL-G