

Supplementary

Article

Cation-Selective Actuator–Sensor Response of Microcrystalline Cellulose Multi-Walled Carbon Nanotubes of Different Electrolytes Using Propylene Carbonate Solvent

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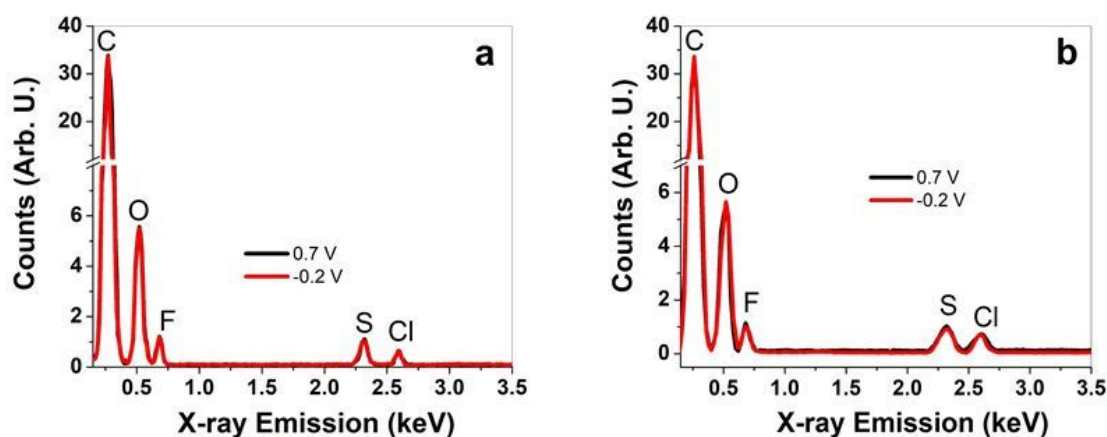


Figure S1. EDX spectroscopy of MC-MCNT fiber at potential 0.7 V (black line) and -0.2 V (red line) presenting the electrolyte LiTF in a) and TBATF in b) with PC solvent.

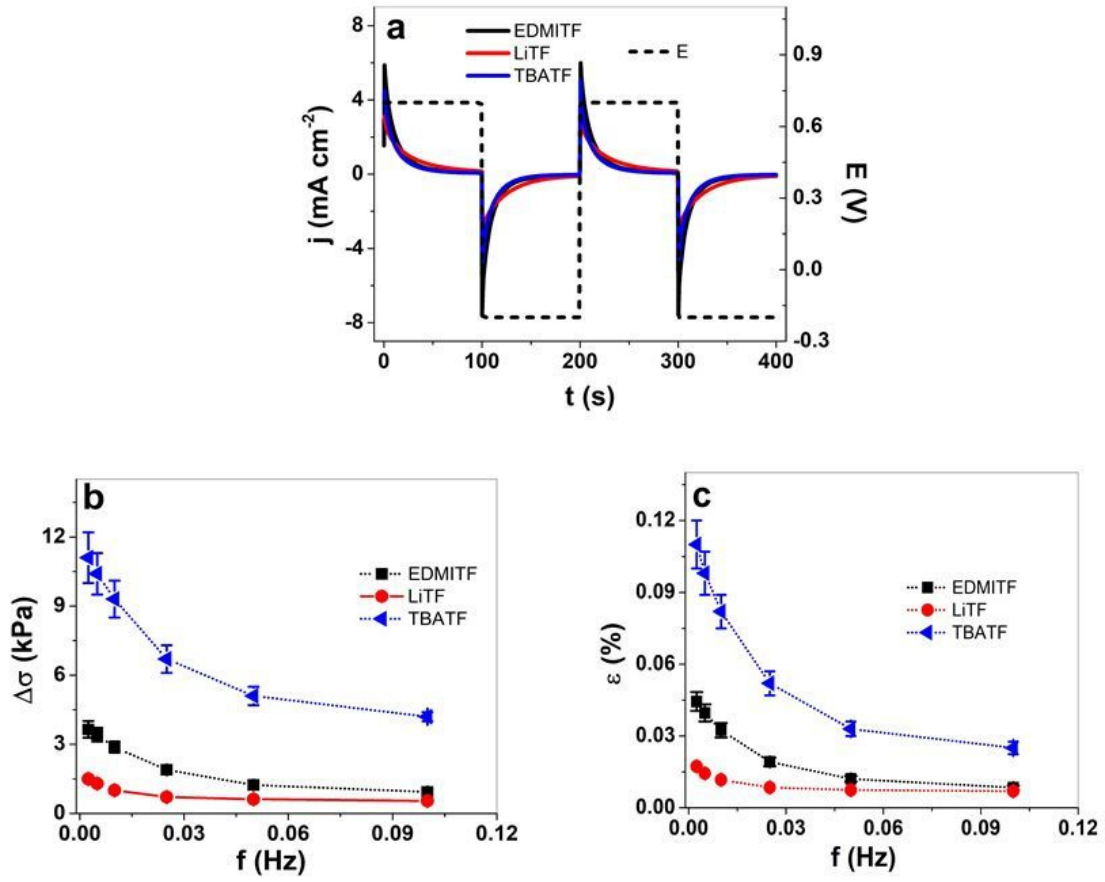


Figure S2. Square wave potential steps of MC-MCNT fiber in three different electrolytes using PC solvent such as EDMITF (black line, ■), LiTF (red line, ●) and TBATF (blue line, ▲) showing at 5 mHz frequency two subsequent cycles (3rd - 4th) of current density j against time t with potential E (0.7 V to -0.2 V) in a). The stress difference $\Delta\sigma$ is shown in b) and the strain ε in c) against the applied frequencies f (0.0025 Hz to 0.1 Hz).

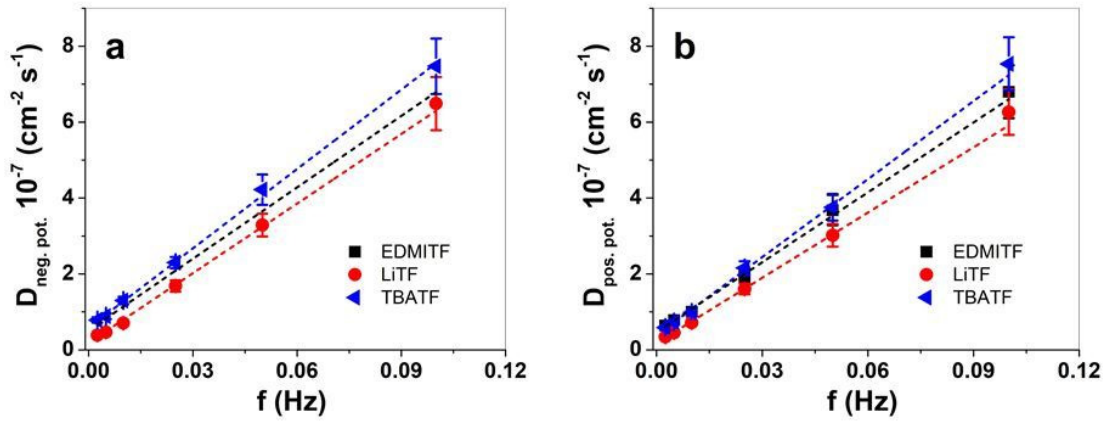


Figure S3. Diffusion coefficient at negative potential $D_{\text{neg. pot.}}$ against applied frequencies f (0.0025 Hz to 0.1 Hz) of MC-MCNT fiber in three different electrolytes such as EDMITF (■), LiTF (●) and TBATF (◄) are shown in a) and the diffusion coefficient at positive potential ($D_{\text{pos. pot.}}$) is presented in b). The dashed lines represent the linear fit.

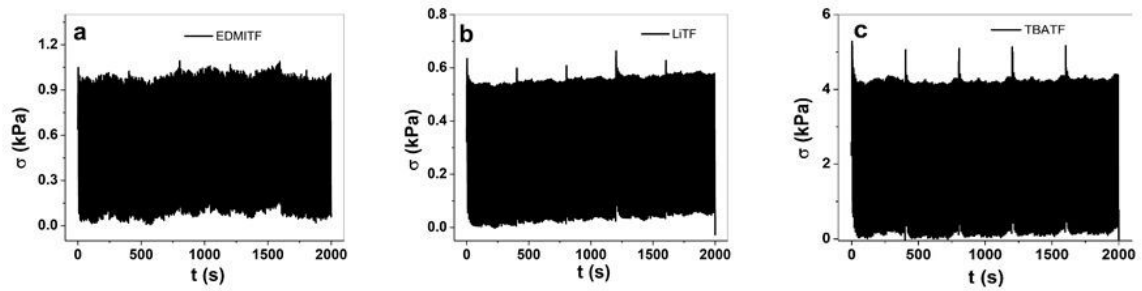


Figure S4. Stress time curves (200 cycles) at 0.1 Hz at a potential range of 0.7 V to -0.2 V of MC-MCNT fibers showing the electrolyte EDMITF in a), LiTF in b) and TBATF in c) using PC as the solvent.

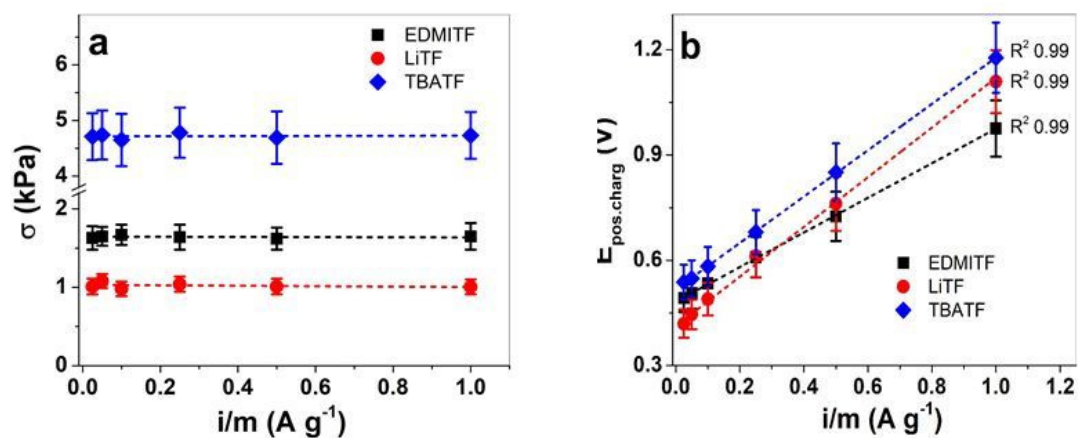


Figure S5. Chronopotentiometric measurements of MC-MCNT fiber in EDMITF (■), LiTF (●), and TBATF (◄) electrolyte in PC solvent showing stress σ in a) and positive charging potential $E_{\text{pos,charg}}$ in b) against current density i/m (± 0.025 A g⁻¹ - ± 1 A g⁻¹). The dashed lines represent the linear fit with a correlation coefficient R^2 at 0.99.