SUPPLEMENTARY INFORMATION

# Charge Storage and Solar Rechargeable Battery Devices Based on Electrodes Electrochemically Modified with Conducting Polymer Nanowires

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Figure S1

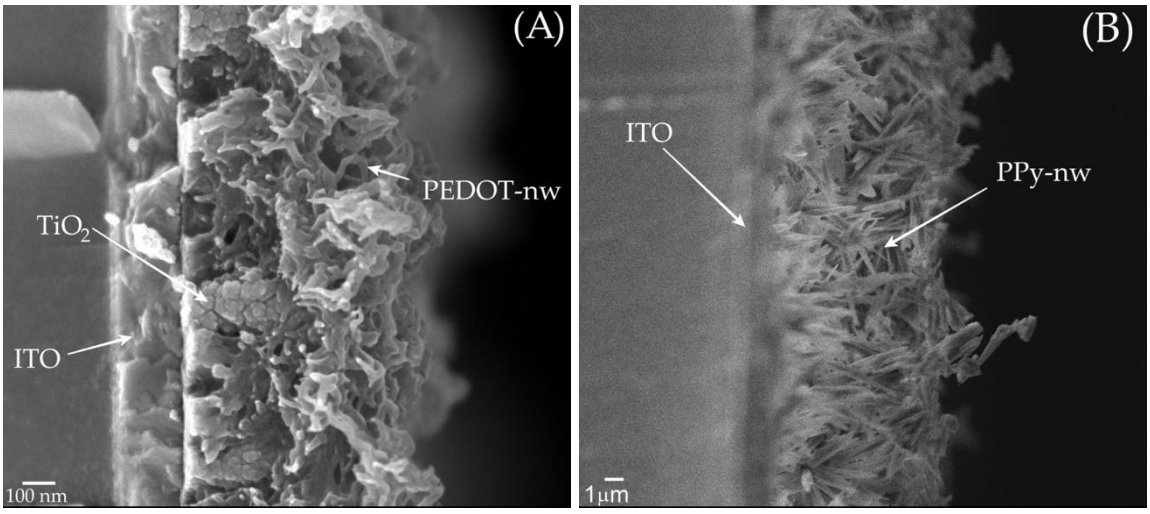


**Figure S1** SEM micrograph of (A) ITO|$TiO_2$|PEDOT-nw and (B) ITO|PPy-nw.

Figure S2

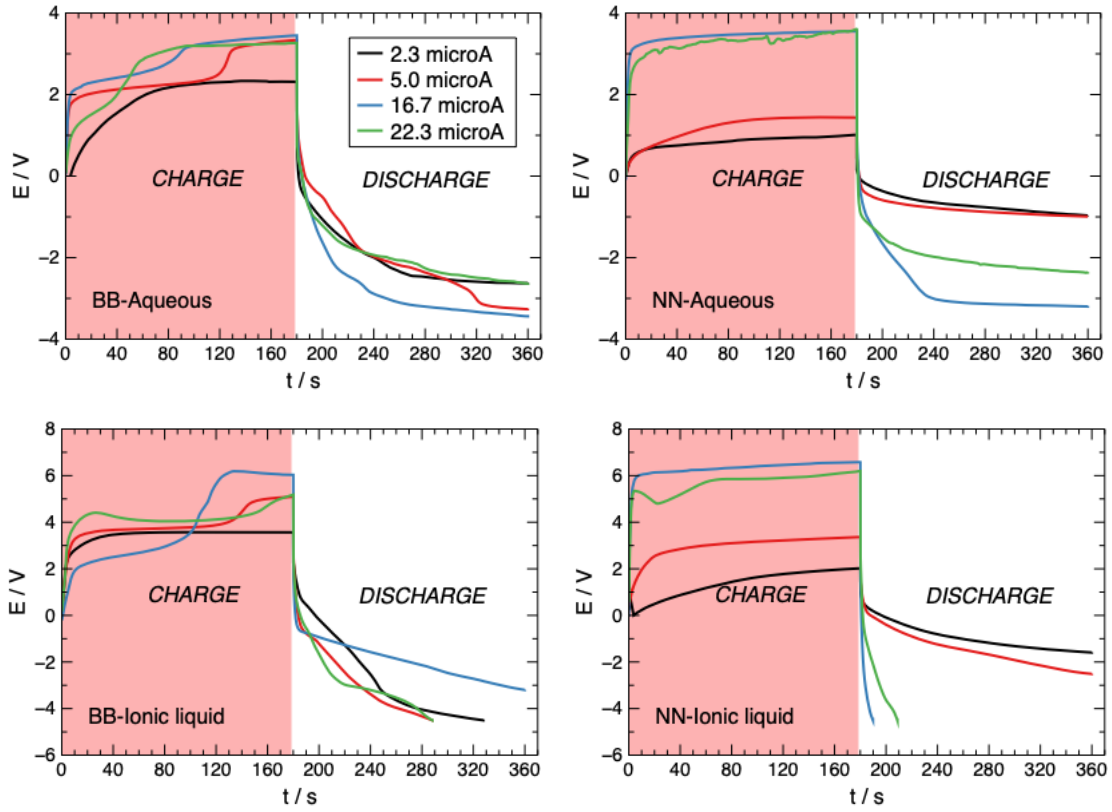


**Figure S2.** Single-step E/t charge/discharge transients registered at different charge currents in aqueous and ionic liquid media.

Figure S3

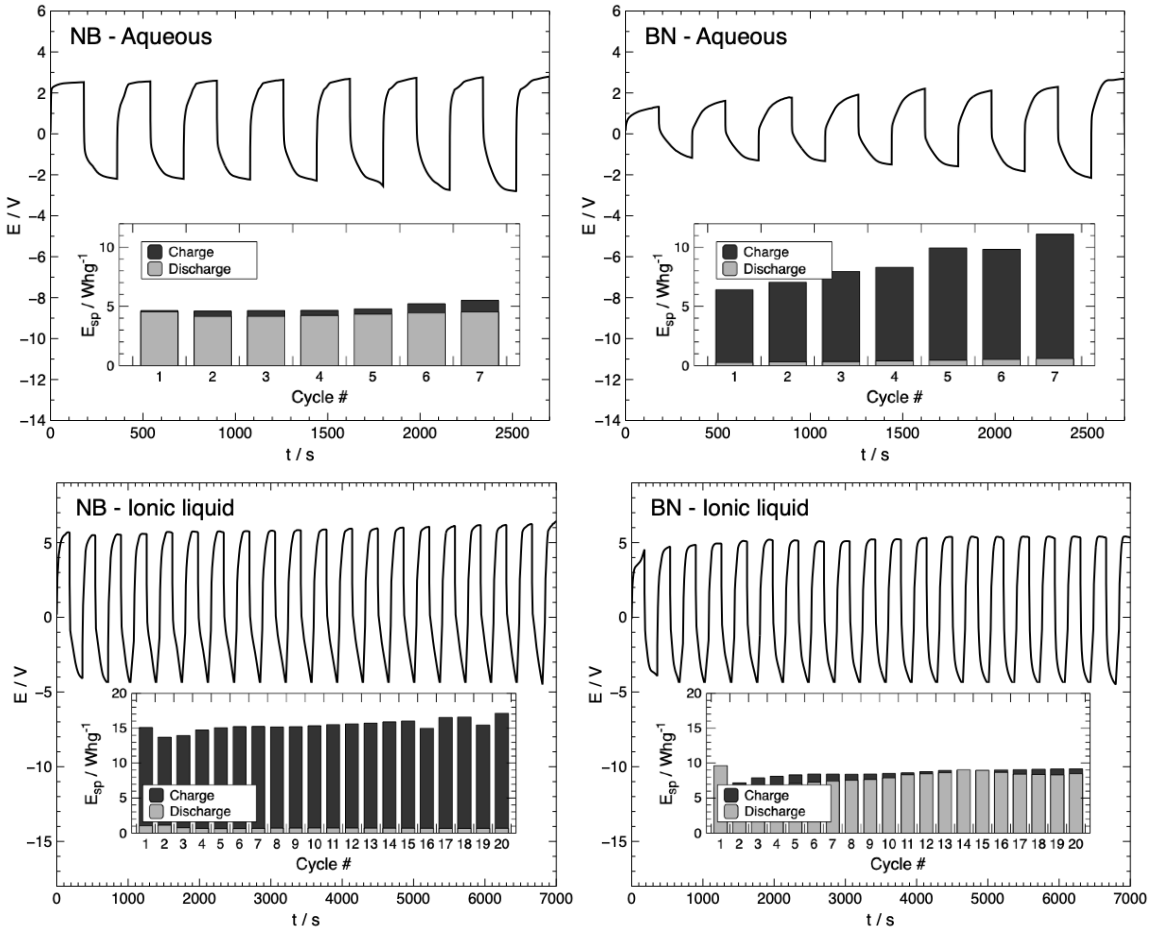


**Figure S3.** Multiple-steps E/t charge/discharge transients registered at ±5μA for nano-nulk (NB) and bulk-nano (BN) electrode configuration in different media. Insert: Energy density calculated for each charge/discharge cycle.

Figure S4

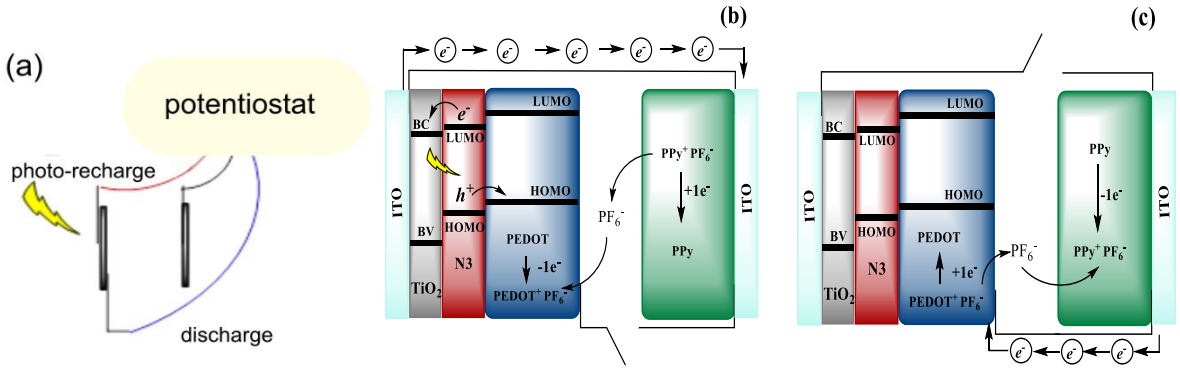


**Figure S4.** Configuration (a) and operating mechanisms of ITO|$TiO_2$|N3|PEDOTnw|Ppynw|ITO solar-energy-rechargeable battery during photocharge (b) and discharge (c) processes.