

Supporting Information  
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**Aqueous Supercapacitors with Wide Operative Voltage Window  
and Long Cycling Life Enabled by Electrolyte Hybridization Effect**

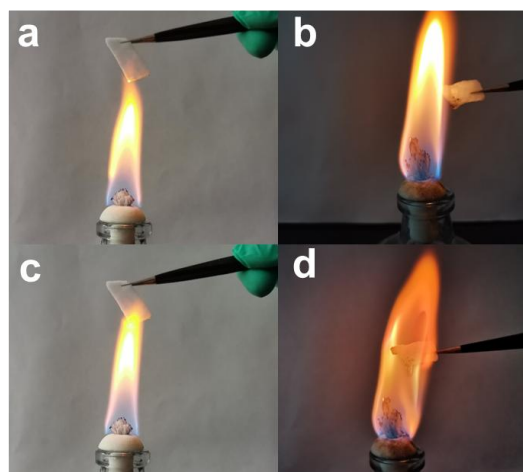
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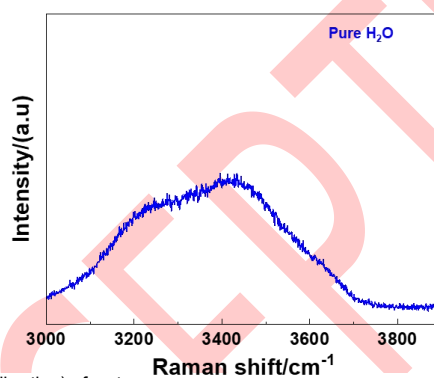
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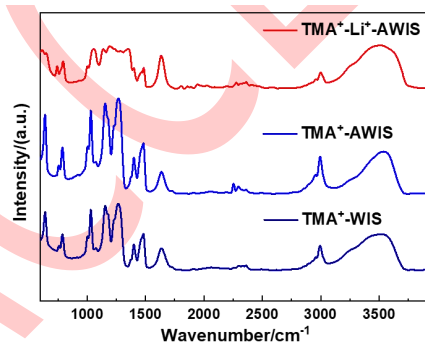
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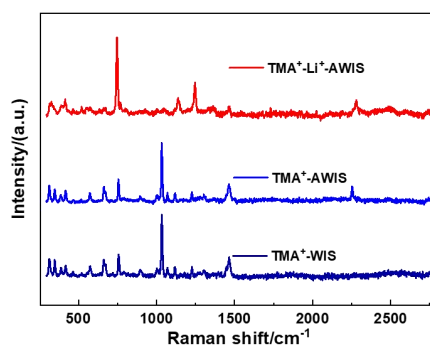
**Figure S1.** Flame resistance testing of TMA<sup>+</sup>-WIS based electrolytes. **a** and **c** The flame resistance testing TMA<sup>+</sup>-WIS electrolytes. **b** and **d** The flame resistance testing TMA<sup>+</sup>-AWIS electrolytes.



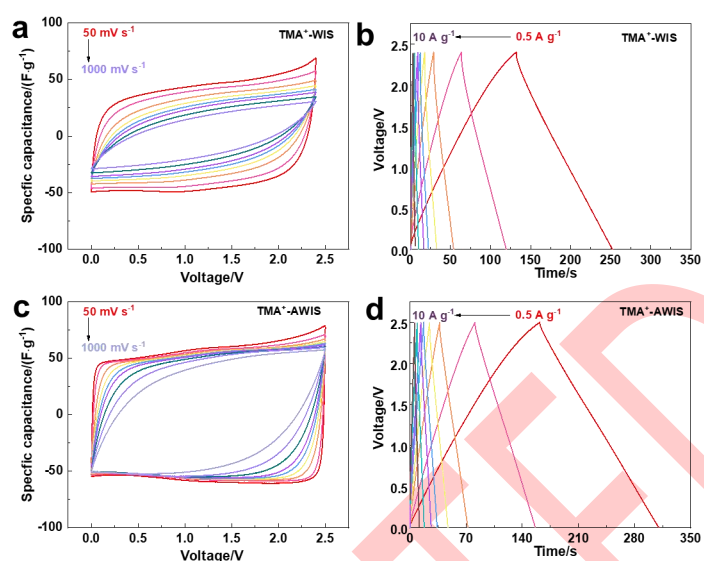
**Figure S2.** The Raman spectra (O-H stretching vibration) of water.



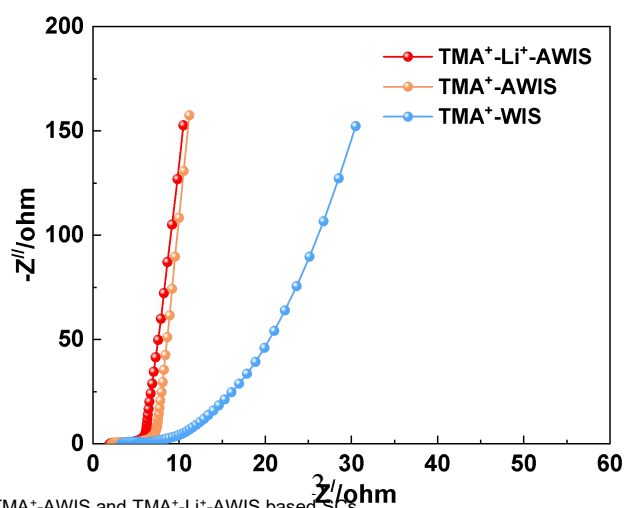
**Figure S3.** The FTIR vibration of TMA<sup>+</sup>-WIS, TMA<sup>+</sup>-AWIS and TMA<sup>+</sup>-Li<sup>+</sup>-AWIS electrolytes.



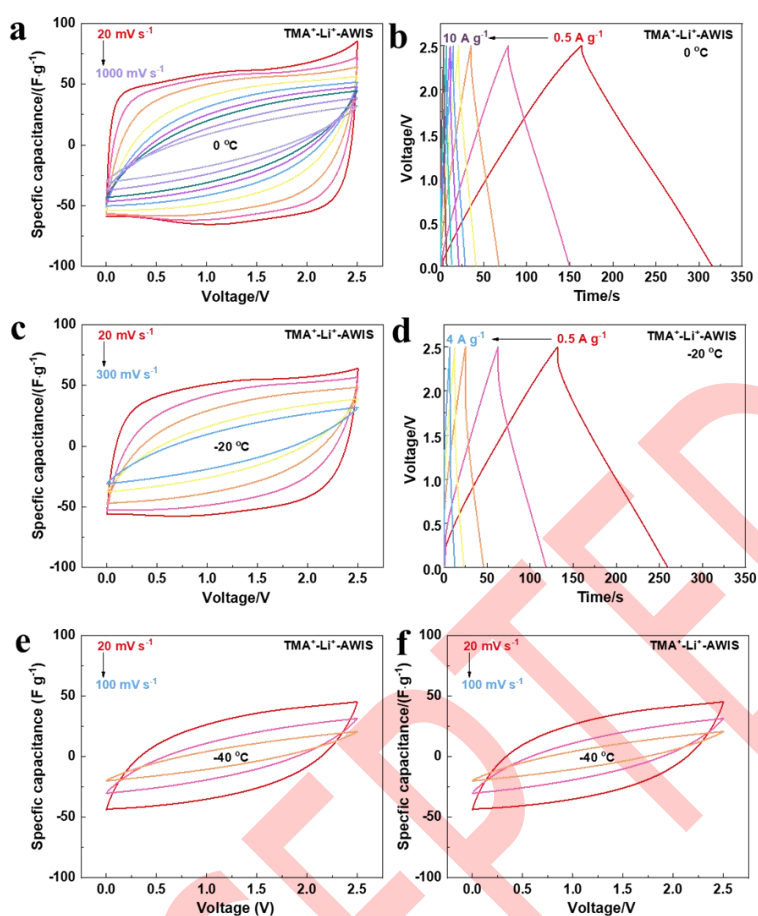
**Figure S4.** The Raman spectra of TMA<sup>+</sup>-WIS, TMA<sup>+</sup>-AWIS and TMA<sup>+</sup>-Li<sup>+</sup>-AWIS electrolytes.



**Figure S5.** **a** The CV curves of TMA<sup>+</sup>-WIS based SCs at the scan rates of 50-1000 mV s<sup>-1</sup>. **b** The GCD curves of TMA<sup>+</sup>-WIS based SCs at 0.5-10 A g<sup>-1</sup>. **c** The CV curves of TMA<sup>+</sup>-AWIS based SCs at the scan rates of 50-1000 mV s<sup>-1</sup>. **d** The GCD curves of TMA<sup>+</sup>-AWIS based SCs at 0.5-10 A g<sup>-1</sup>.



**Figure S6.** The EIS plots of TMA<sup>+</sup>-WIS, TMA<sup>+</sup>-AWIS and TMA<sup>+</sup>-Li<sup>+</sup>-AWIS based SCs.



**Figure S7.** **a** The CV curves of TMA<sup>+</sup>-Li<sup>+</sup>-AWIS based SCs at 0 °C with the scan rates of 20-100 mV s<sup>-1</sup>. **b** The GCD curves of TMA<sup>+</sup>-Li<sup>+</sup>-AWIS based SCs at 0 °C with the current density of 0.5-10 A g<sup>-1</sup>. **c** The CV curves of TMA<sup>+</sup>-Li<sup>+</sup>-AWIS based SCs at -20 °C with the scan rates of 20-300 mV s<sup>-1</sup>. **d** The GCD curves of TMA<sup>+</sup>-Li<sup>+</sup>-AWIS based SCs at -20 °C with the current density of 0.5-10 A g<sup>-1</sup>. **e** The CV curves of TMA<sup>+</sup>-Li<sup>+</sup>-AWIS based SCs at -40 °C with the scan rates of 20-100 mV s<sup>-1</sup>. **f** The GCD curves of TMA<sup>+</sup>-Li<sup>+</sup>-AWIS based SCs at -40 °C with the current density of 0.5-1 A g<sup>-1</sup>.