Supporting Information

Achieving extraordinary enhanced reversible capacitance through the synergy between octahedral structure and isovalent ionic doping

By Minghua Chen*, Zhen Zhao, Junfeng Zhao, Qian Liu, Jiawei Zhang, Yuqing Wang, Yu Li*

Key Laboratory of Engineering Dielectric and Applications (Ministry of Education), School of Electrical and Electronic Engineering, Harbin University of Science and Technology, Harbin 150080, P. R. China

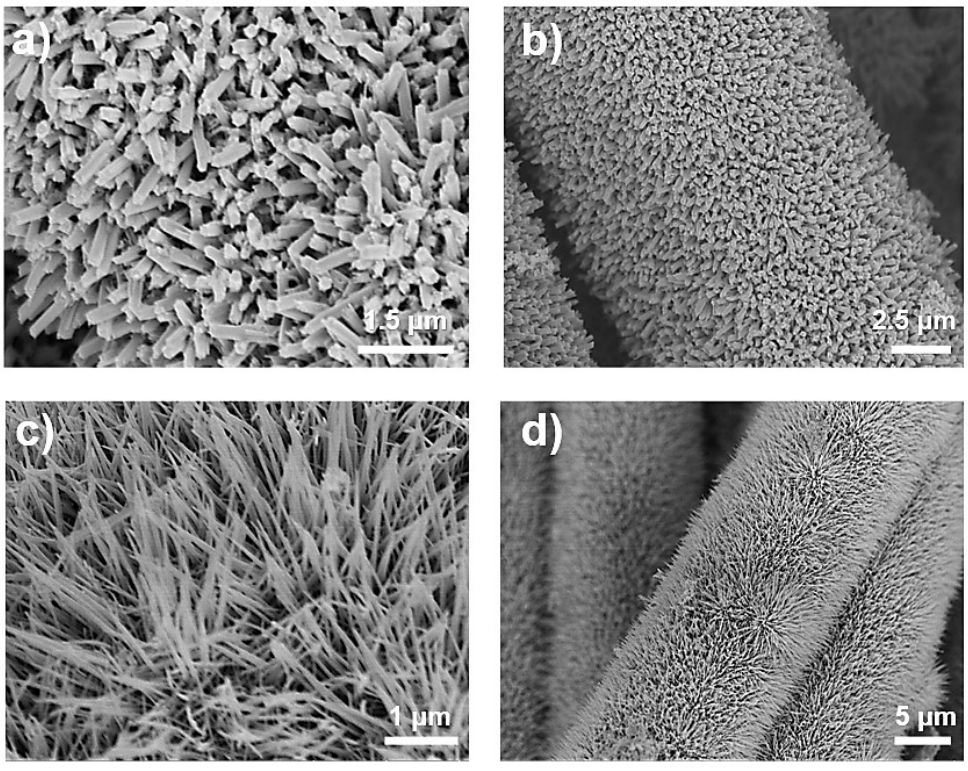

Figure S1. (a, b) SEM images of 1% Co-doped WN nanorods, (c, d) SEM images of

20% Co-doped WN nanowires.

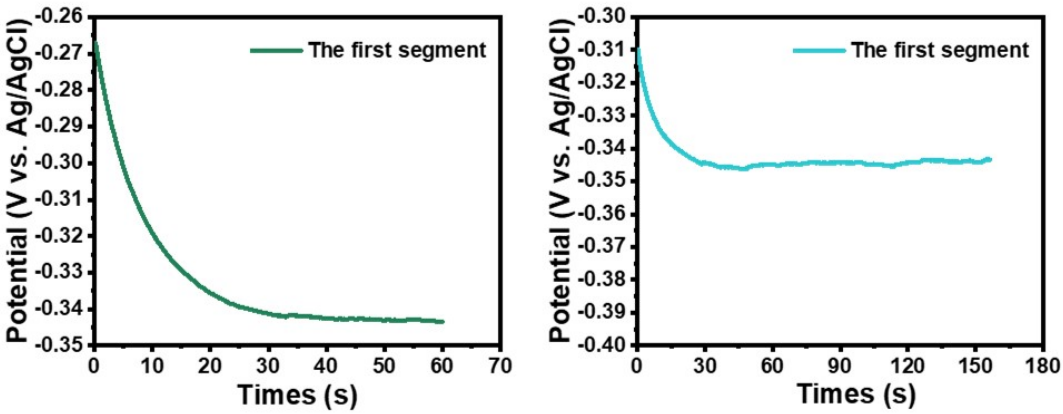

Figure S2. More negative potentials at -0.35V and -0.4V

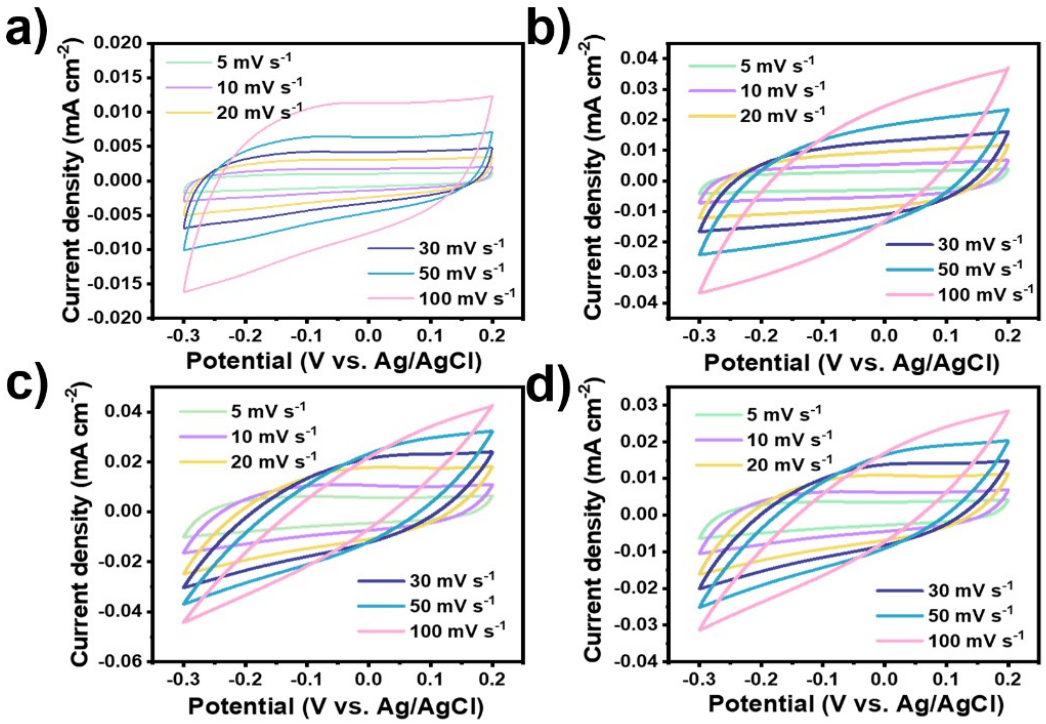

Figure S3. (a-d) CV curves of pure WN, 1% Co-doped WN, 5% Co-doped WN and 20% Co-doped WN samples at different scanning rates from 5 to 100 mV s^{-1}.

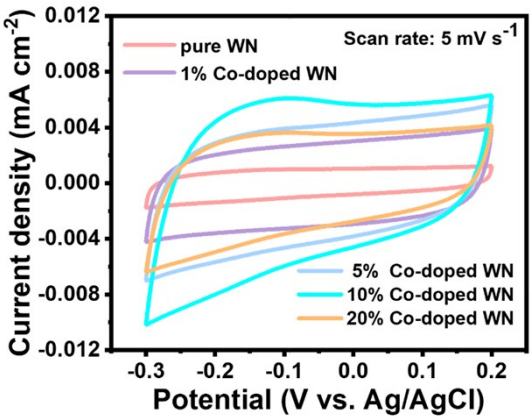

Figure S4. The CV curves of different samples at the scan rate of 5 mV s^{-1}

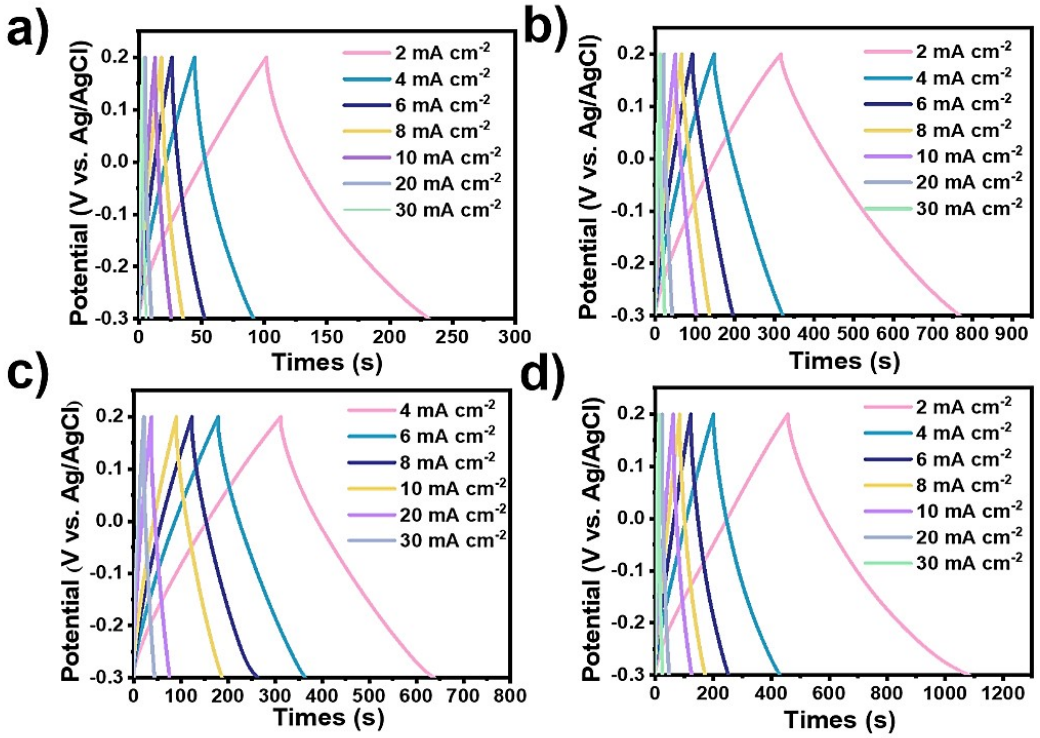

Figure S5. (a-d) GCD curves of pure WN, 1% Co-doped WN, 5% Co-doped WN and 20% Co-doped WN samples at various current density.

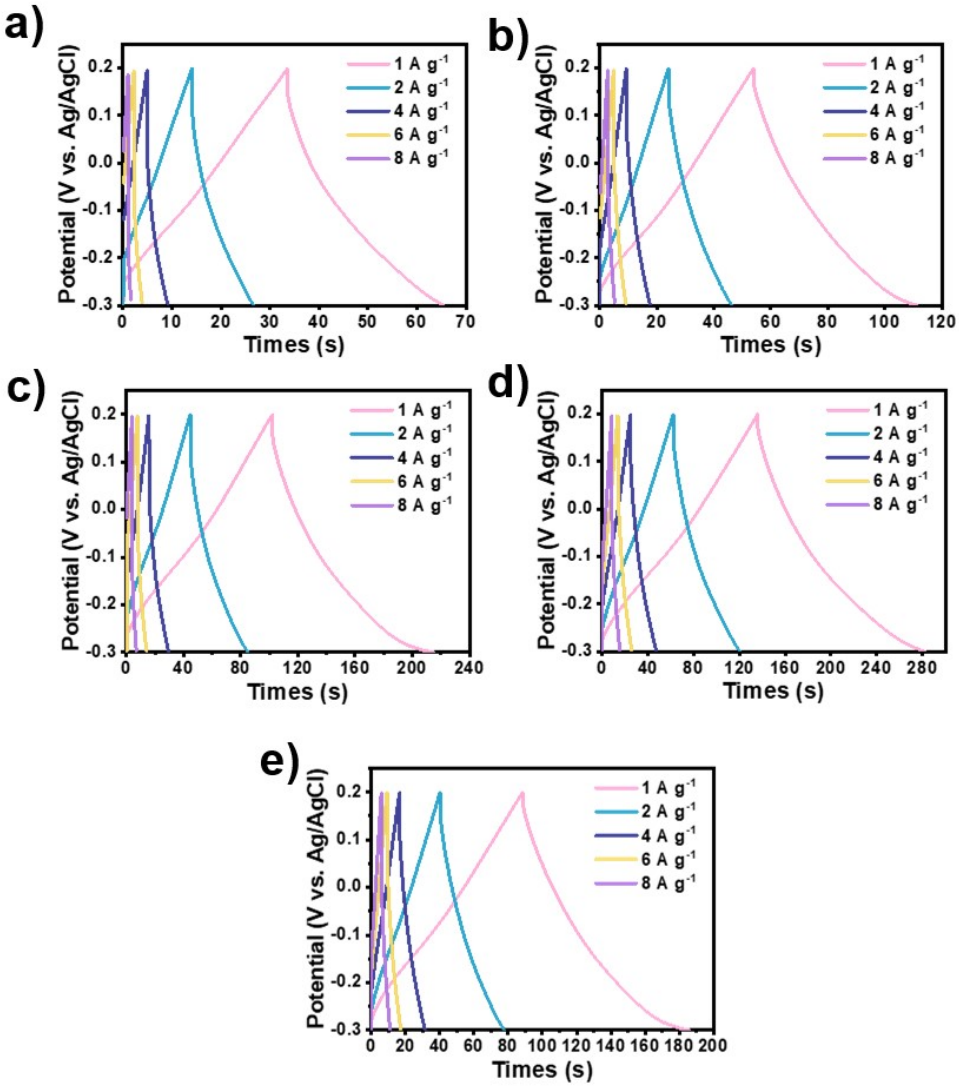

Figure S6. The mass-specific capacitance of a) WN, b) 1% Co-doped WN, c) 5% Co-doped WN, d) 10% Co-doped WN and e) 20% Co-doped WN samples.

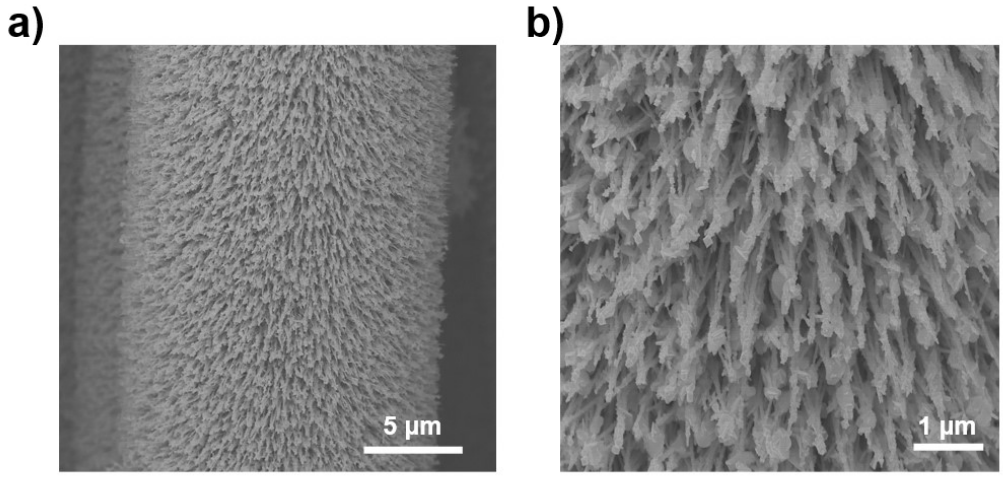

Figure S7. SEM images of the 10% Co-doped WN@CC sample after 10,000 cycles: a) a low-magnification image, b) a high-magnification image.

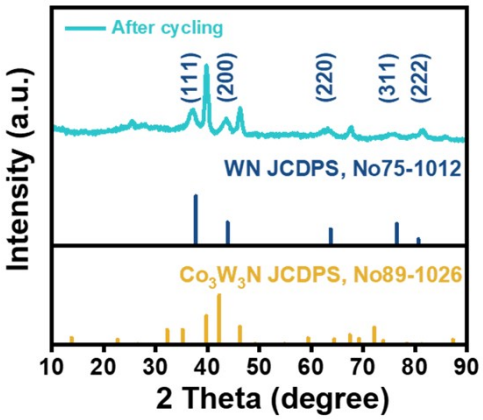

Figure S8. XRD pattern of the 10% Co-doped WN@CC sample after 10,000 cycles

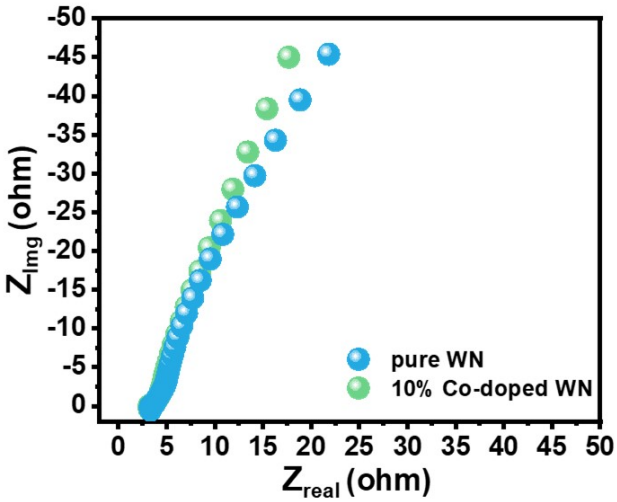

Figure S9. EIS of pure WN and 10% Co-doped WN.

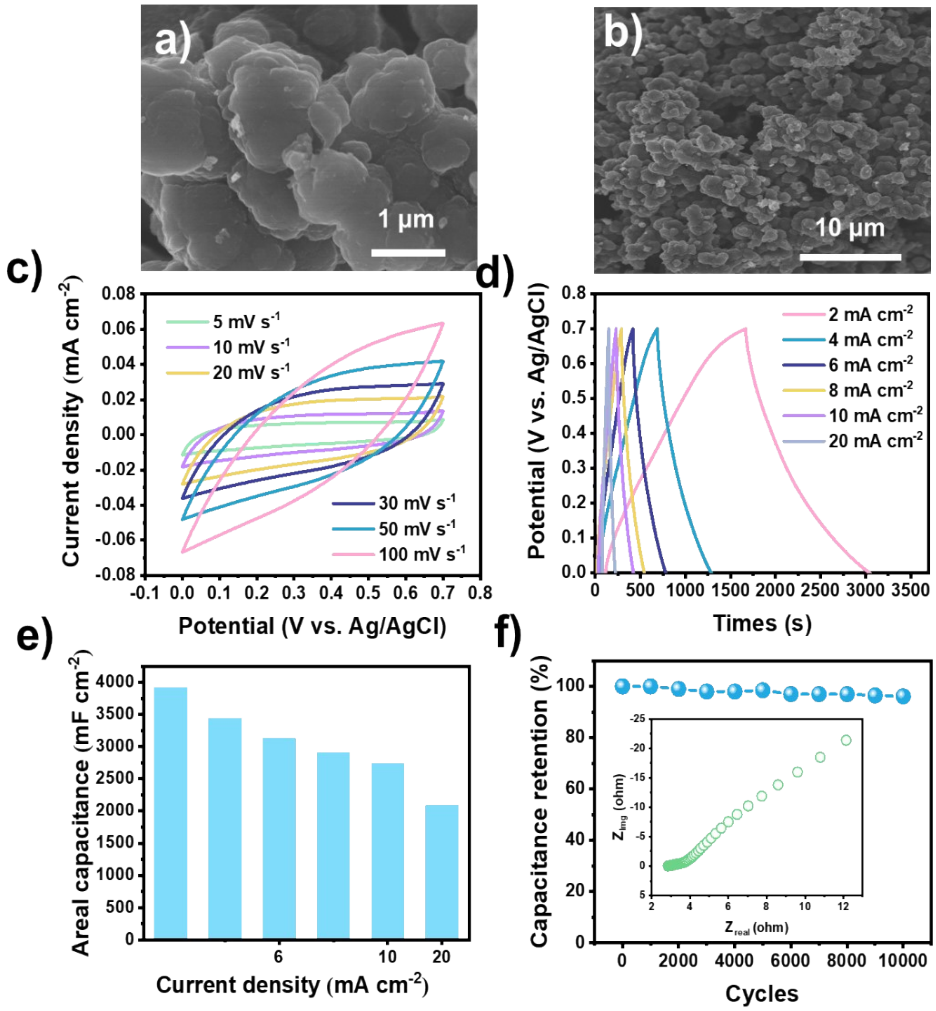

Figure S10. Electrochemical characterizations of PPy@CC electrode: a,b) SEM images of PPy@CC. c,d) CV and GCD curves at different scan rates and current densities, respectively. e) The areal capacitance of PPy@CC electrode. f) Cycling stability over 10,000 cycles at a current density of 60 mA/cm^2 of PPy@CC electrode; inset shows the typical Nyquist plot.

Table S1. Comparison of Co/W atomic percent for 10% Co-doped WN sample, after 500 cycles and after 10,000 cycles

10% Co-doped WN sample	**Co/W atomic percent**
Before cycling	3.5%
After 500 cycles	3.32%
After 10,000 cycles	3.73%