Electronic Supplementary Material (ESI) for Nanoscale Advances.

Improved Conductivity and Ionic Mobility in Nanostructured Thin Films via Aliovalent Doping for Ultra-High Rate Energy Storage

Nanoscale Advances

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Supplemental Table S1 *Literature review of doped-TiO_2 materials of various morphologies and dopants.*

Morphology	Dopant	Cycling Rates	Performance	Reference
Solid sphere	Nb	0.1 – 50 C	120 mAh g^{-1} at 50 C	[1][1]
Solid sphere	Ta	0.15 – 20 C	130 mAh g^{-1} at 10 C	[2][2]
Mesoporous spheres	Zn	0.2 – 30 C	~45 mAh g^{-1} at 20 C	[3][3]
Mesoporous spheres	Cr, N	0.1 – 10 C	127 mAh g^{-1} at 10 C	[4][4]
Nanorod	N	0.5 – 20 C	131 mAh g^{-1} at 20 C	[5][5]
Nanotube	S	0.1 – 10 C	167 mAh g^{-1} at 10 C	[6][6]
Solid sphere	Zr/F	1 – 10 C	~140 mAh g^{-1} at 10 C	[7][7]
Nanotube	C	70 mA g^{-1}	~100 mAh g^{-1}	[8][8]
Solid sphere	Sn	0.1 – 10 A g^{-1}	~75 mAh g^{-1} at 10 A g^{-1}	[9][9]
Nanosheet	Mn	30 – 500 mA g^{-1}	~150 mAh g^{-1} at 500 mA g^{-1}	[10][10]
Nanowire	C	0.5 – 10 C	172 mAh g^{-1} at 10 C	[11][11]
Core-shell sphere	N	0.2 – 2 A g^{-1}	~240 mAh g^{-1} at 2 A g^{-1}	[12][12]
Nanofiber	Nb	0.05 – 5 C	23 mAh g^{-1} at 5 C	[13][13]
Solid particles	Mo/Nb	0.1 – 15 A g^{-1}	42 mAh g^{-1} at 15 A g^{-1}	[14][14]

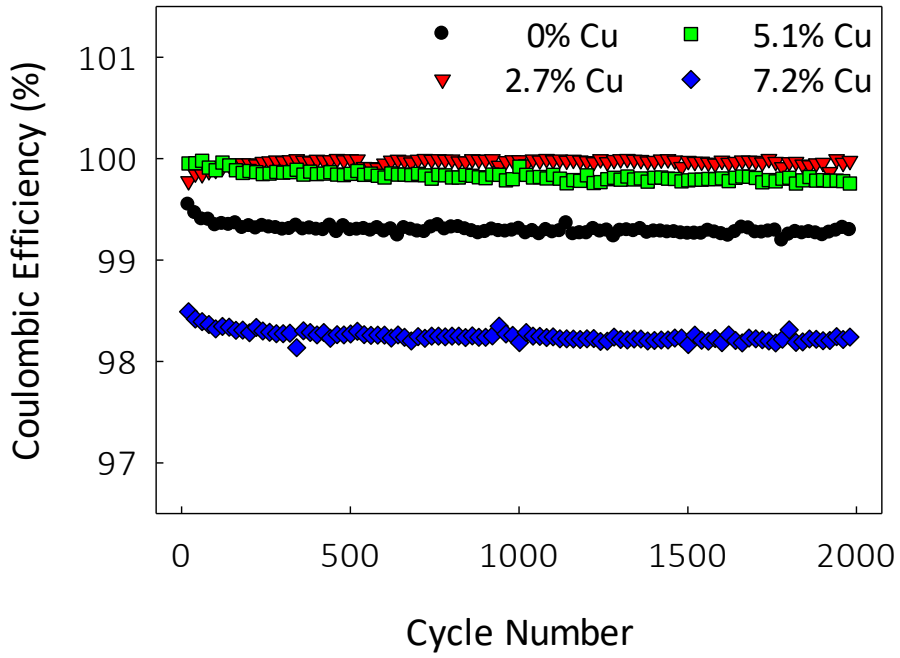

Figure S1 Coulombic efficiencies of batteries over 2000 cycles at a charge rate of 10 C.

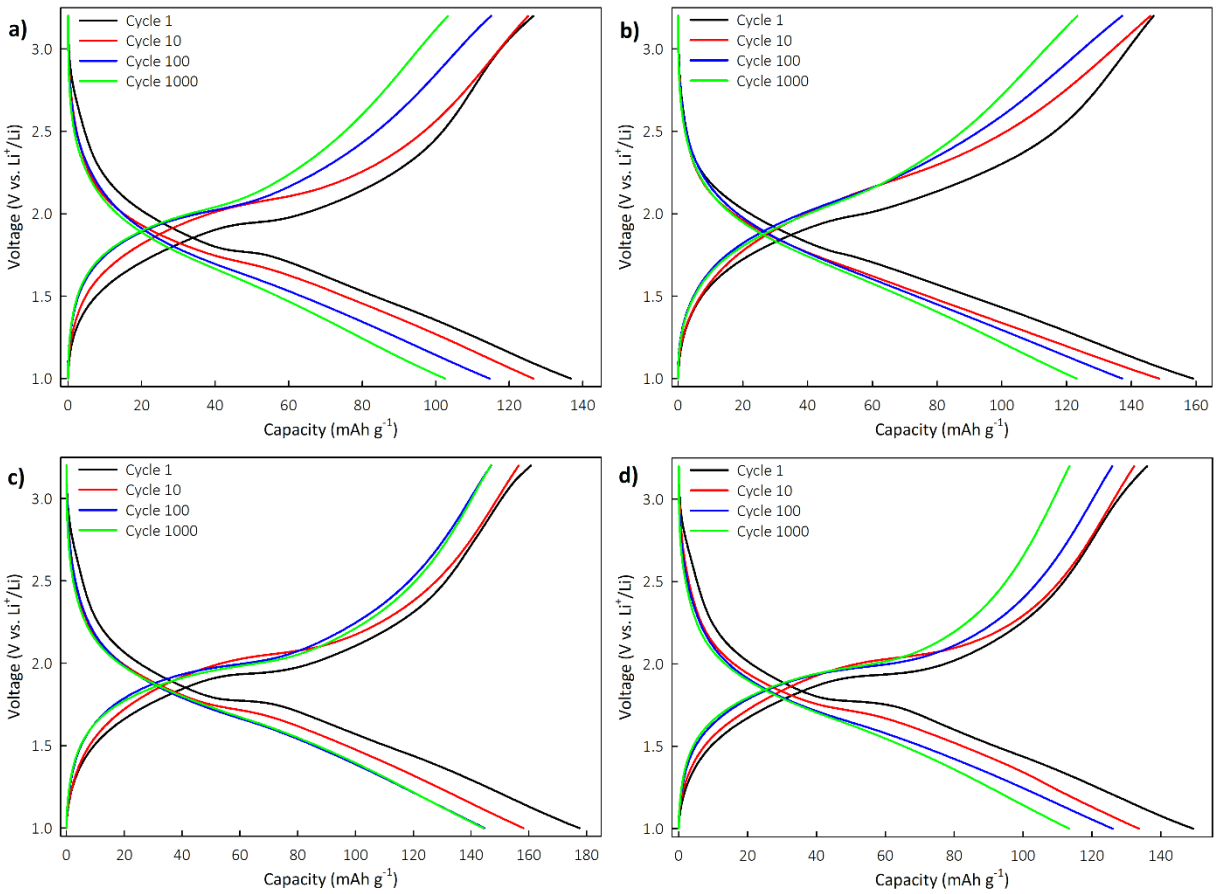

Figure S2 Charge/discharge profiles of the 1st, 10th, 100th, and 1000th cycles for the a) 0% Cu, b) 2.7% Cu, c) 5.1% Cu, and d) 7.2% Cu electrodes during cycling at a rate of 10 C.

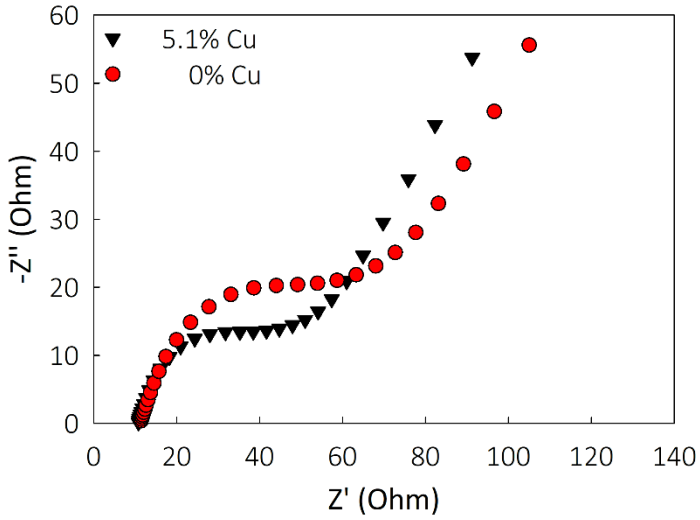

Figure S3 Nyquist plots of the frequency dependent impedance of the 0% and 5.1% Cu electrodes.

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