Supporting information

MOF-Derived Nitrogen-Doped ZnSe Polyhedrons Encapsulated by Reduced Graphene Oxide as Anode for Lithium and Sodium Storage

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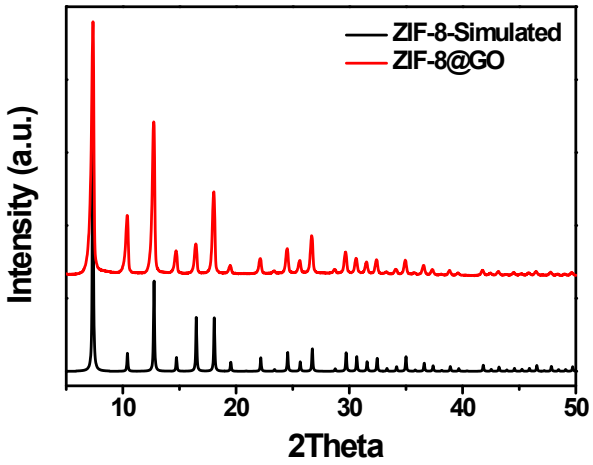

Figure S1 The XRD pattern of simulated ZIF-8 and ZIF-8@GO.

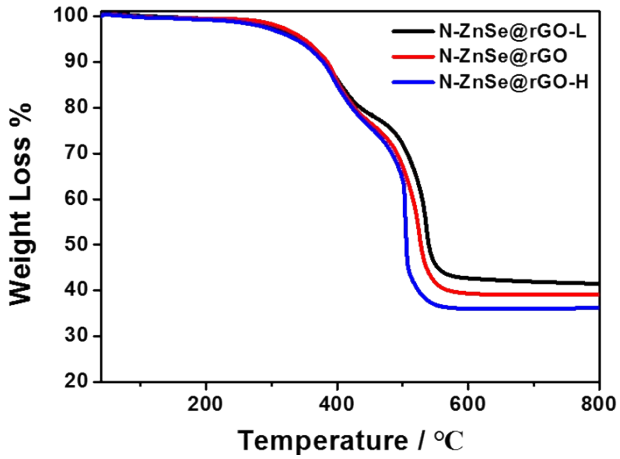

Figure S2 TGA plots of N-ZnSe@rGO-L, N-ZnSe@rGO and N-ZnSe@rGO-H.

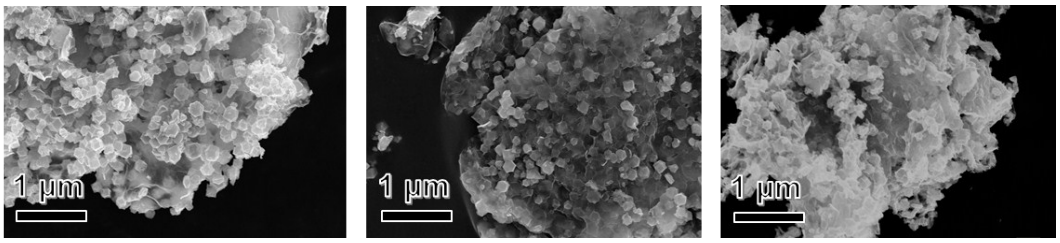

Figure S3 SEM images of (a) N-ZnSe@rGO-L, (b) N-ZnSe@rGO and (c) N-ZnSe@rGO-H.

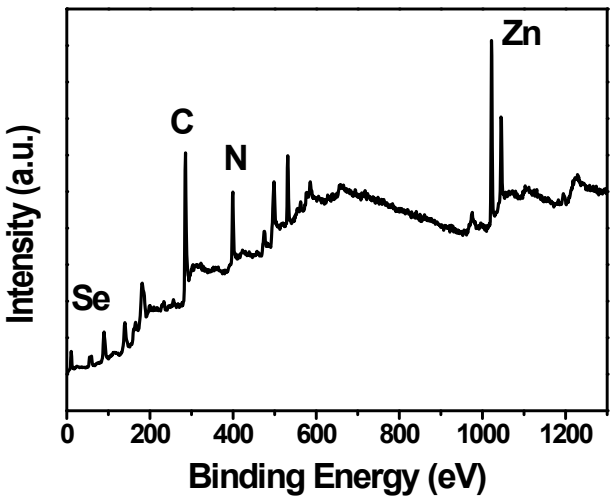

Figure S4 The XPS survey spectrum of N-ZnSe@rGO.

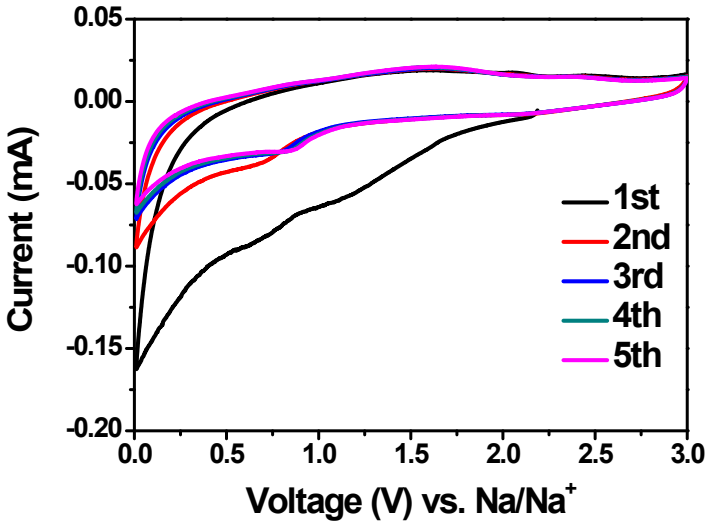

Figure S5 Cyclic voltammetry curves scanned at a rate of 0.01 mV s^{-1} in the voltage window of 0.01-3.0 V.

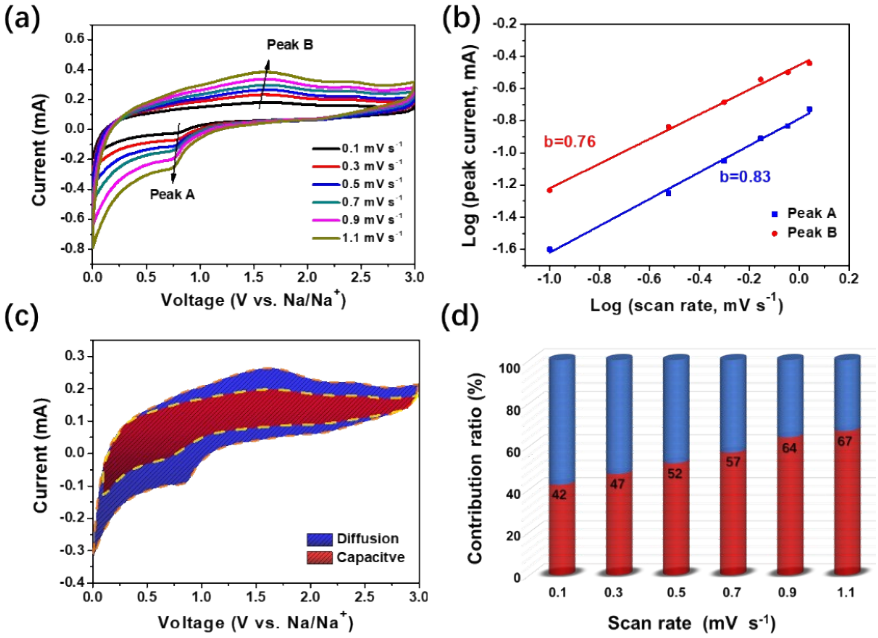

Figure S6. Kinetic analysis of N-ZnSe@rGO electrode for SIBs. (a) CV curves at different scan rates ranging from 0.1 to 1.1 mV s^{-1}, (b) Calculation of the b values by plotting log *i* vs. log *v* plots, (c) Capacitive and diffusion contribution to the charge storage process at the scan rate of 0.5 mV s^{-1}, (d) The percentage of capacitive contributions with sweep rates from 0.1 to 1.1 mV s^{-1}.

Table S1 Equivalent circuit parameters collected from fitting the impedance spectra of the N-ZnSe@rGO

Sample	Battery type	R_s (Ω)	R_{ct} (Ω)
N-ZnSe@rGO	Lithium	3.4	148.7
	Sodium	6.2	239.9

R_s is the combination of electrolyte resistance and ohmic resistance of cell components, R_{ct} is represented for the charge-transfer resistance of electrochemical reactions.

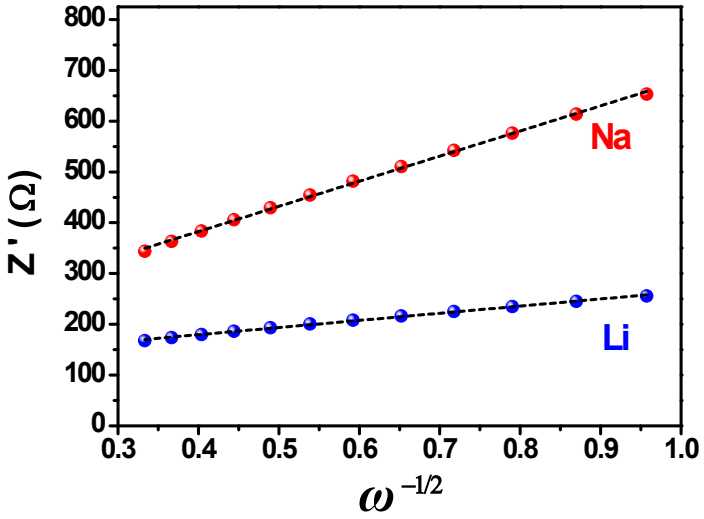

Figure S7 Real parts of the impedance (Z') versus the reciprocal square root of the angular frequency ($\omega^{-1/2}$) in low frequency region of the above N-ZnSe@rGO electrode.