Supplementary Material

Structure and Chemistry of the Solid Electrolyte Interphase (SEI) on a High Capacity Conversion-based Anode: NiO

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Table S-1. Hypothetical generalized mechanism where n is the total number of e^-, $\vec{\gamma}$ is the number of e^- before RDS, $\overleftarrow{\gamma}$ is the number of e^- after RDS, and ρ is either 0 (chemical) or 1 (electrochemical) [1,2]

Generalized Reaction for $A + ne^- \rightleftharpoons z$	# of electrons
$A + e^- \rightleftharpoons B$	1
$B + e^- \rightleftharpoons C$	2
$\downarrow \quad \ldots \quad \downarrow$	$\downarrow$
$M + e^- \rightleftharpoons N$	$\vec{\gamma}$
$N + \rho e^- \rightleftharpoons O$	$\vec{\gamma} + \rho$ ←RDS
$O + e^- \rightleftharpoons P$	$\overleftarrow{\gamma}$
$\downarrow \quad \ldots \quad \downarrow$	$\downarrow$
$X + e^- \rightleftharpoons Y$	n-1
$Y + e^- \rightleftharpoons Z$	n

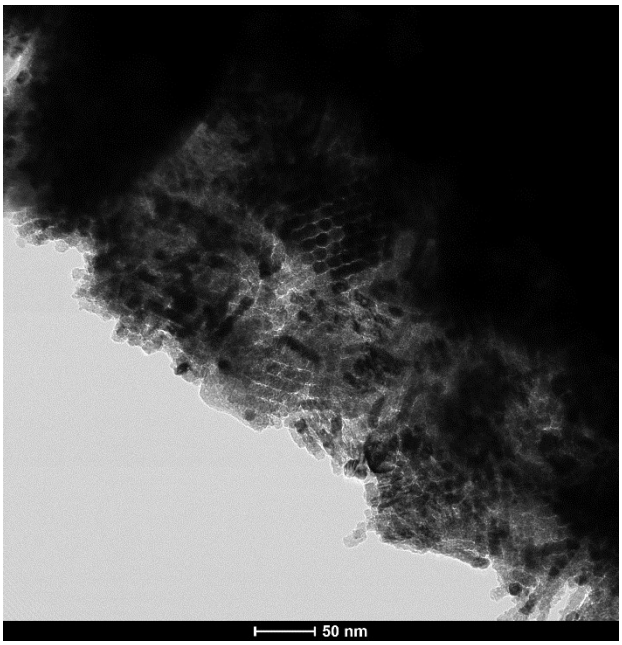

Figure S-1. Transmission electron microscopy of pre-cycled surface mesostructure of NiO

References

1. Fletcher, S. Tafel slopes from first principles. *J. Solid State Electrochem.* **13**, 537–549 (2009).
2. Bockris, J. O. M. & Nagy, Z. Symmetry factor and transfer coefficient: A source of confusion in electrode kinetics. *J. Chem. Educ.* **50**, 839–843 (1973).