Supporting Information

for *Energy & Environmental Science*, DOI: 10.1039/c0xx00000x

**Sodium insertion in carboxylate based materials and their application in 3.6 V full sodium cells**

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**Figure S1.** XRD of Na₂BDC, NaHBDC and Na₀.7₃Mn₀.7Ni₀.2₃O₂ pristine materials.
Figure S2. SEM pictures of Na$_2$BDC (a), NaHBDC (b) and Na$_{0.75}$Mn$_{0.7}$Ni$_{0.23}$O$_2$ (c). For Na$_{0.75}$Mn$_{0.7}$Ni$_{0.23}$O$_2$ material, SEM images shows the formation of ~20 μm particle size spherical secondary particles.

Figure S3. TGA of Na$_2$BDC, and NaHBDC showing good thermal stability until ~480°C for Na$_2$BDC and until ~300°C for NaHBDC.
Figure S4. Voltage profile and capacity retention of Na/Na$_2$BDC cell for 50 cycles under 10 and 20 mA/g current density.

Figure S5. Voltage profile and capacity retention of Li/Na$_2$BDC cell for 100 cycles under 20 and 40 mA/g current density showing good cycleability.
Figure S6. 2nd cycle dQ/dV curves of Na/Na$_2$BDC and Li/Na$_2$BDC systems under 20 mA/g current density.

Figure S7. Voltage profile and capacity retention of of Li/NaHBDC cell for 100 cycles under 40 mA/g current density.
**Figure S8.** Voltage profile and Capacity retention of Na/HTDA half-cell showing poor cycleability.

**Figure S9.** (a) Voltage profile and (b) Capacity retention of Na/NaHBDC half-cell for 50 cycles under the current rate of 40 mA g\(^{-1}\) between 0.1 V and 1.7 V demonstrates that this anode can be cycled using Al current collector contrary to lithium batteries as no Al-Na was predicted by their phase diagram.