## High-Rate Aqueous-Based Supercapacitors at -30 °C drived by Novel 1D Ni(OH)<sub>2</sub>

## Nanorods and Two-Solute Electrolyte

Wutao Wei,<sup>a,b</sup> Weihua Chen,<sup>c</sup> Liwei Mi,<sup>\*b</sup> Jiaqiang Xu<sup>a</sup> and Jiujun Zhang<sup>\*a</sup>



Figure S1. (a-b) High magnification and low magnification FESEM images of NO0; (c-d) high magnification and low magnification FESEM images of NO16.



Figure S2. (a) FESEM image and (b-f) the corresponding EDS mapping images of the sample obtained by dropping the reaction supernatant on the glass sheet at the beginning of

Ni(OH)2 precipitation and the subsequent drying process.



Figure S3. (a) FESEM image and (b-f) the corresponding EDS mapping images of the upper green sample obtained by direct centrifugation of the reaction solution after the

precipitation reaction without washing by water and anhydrous ethanol.



Figure S4. (a) FESEM image, (b-c) the EDS cures of the cross section of Ni(OH)<sub>2</sub> nanorods and NaCl crystal from the upper green sample obtained by direct centrifugation of the

reaction solution after the precipitation reaction without washing by water and anhydrous ethanol.



Figure S5. The calculated value of interatomic distance from the as-obtained materials based on the simulated crystal structure. (a) The distance between the adjacent hydrogen atoms in the different crystal layers. (b) The distance between adjacent hydrogen atoms in the same crystal layer. (c) The distance between neighboring oxygen atoms. (d) The distance between neighboring oxygen and nickel atoms.



Figure S6. XPS spectrum of (a) Ni 2p and (b) O 1s for NO16.



Figure S7. (a) The low-magnification TEM image and (b) the corresponding HRTEM image of the bifurcation of NO16 nanorod. (c) The top and side views of the simulated crystal structure crystal structure of NO16.



Figure S8. CV curves of (a) NO0//AC, (b) NO4//AC, (c) NO8//AC, (d) NO12//AC and (e) NO16//AC at 1, 2, 3 and 5 mV s<sup>-1</sup> at room temperature, respectively. (f) The corresponding CV curves of NO0//AC, NO4//AC, NO8//AC, NO12//AC and NO16//AC at scan rates of 2 mV s<sup>-1</sup>, respectively.



Figure S9. Photos of (a) the single-solute electrolyte consisting of 2 M KOH and (b) the two-solute electrolyte consisting of 0.4 M NaCl and 2 M KOH in deionized water/ethylene glycol with a volume ratio of 2:1, which were left to rest overnight at -30 °C.



Figure S10. Galvanostatic discharge curves of NO16//AC at different current densities and (a) 0 °C and (b) -10 °C. (c) The corresponding rate performance curves of NO//AC at room

temperature, 0 °C, -10 °C and -30 °C.