

Supporting Information for

**Fabrication of monodisperse nitrogen-doped carbon
double-shell hollow nanoparticles for supercapacitors**

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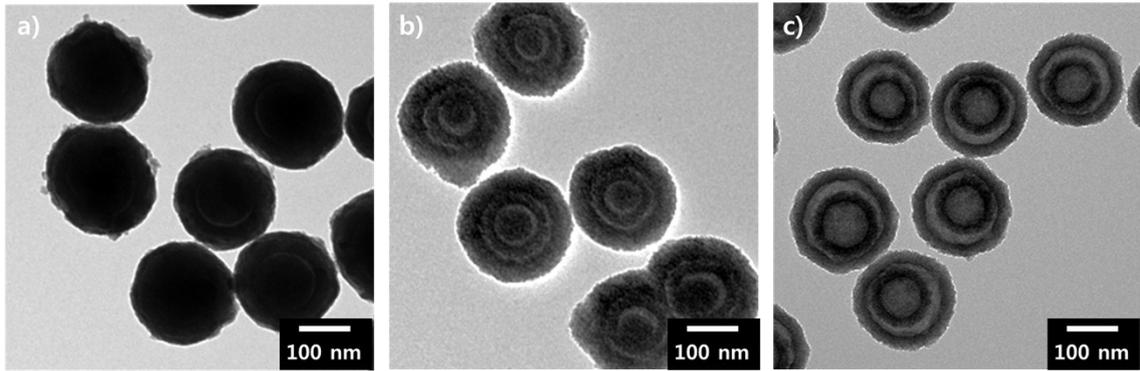


Figure S1. TEM images of a) STST CSNPs, b) intermediate structured ST DS-HNPs, and c) ST DS-HNPs

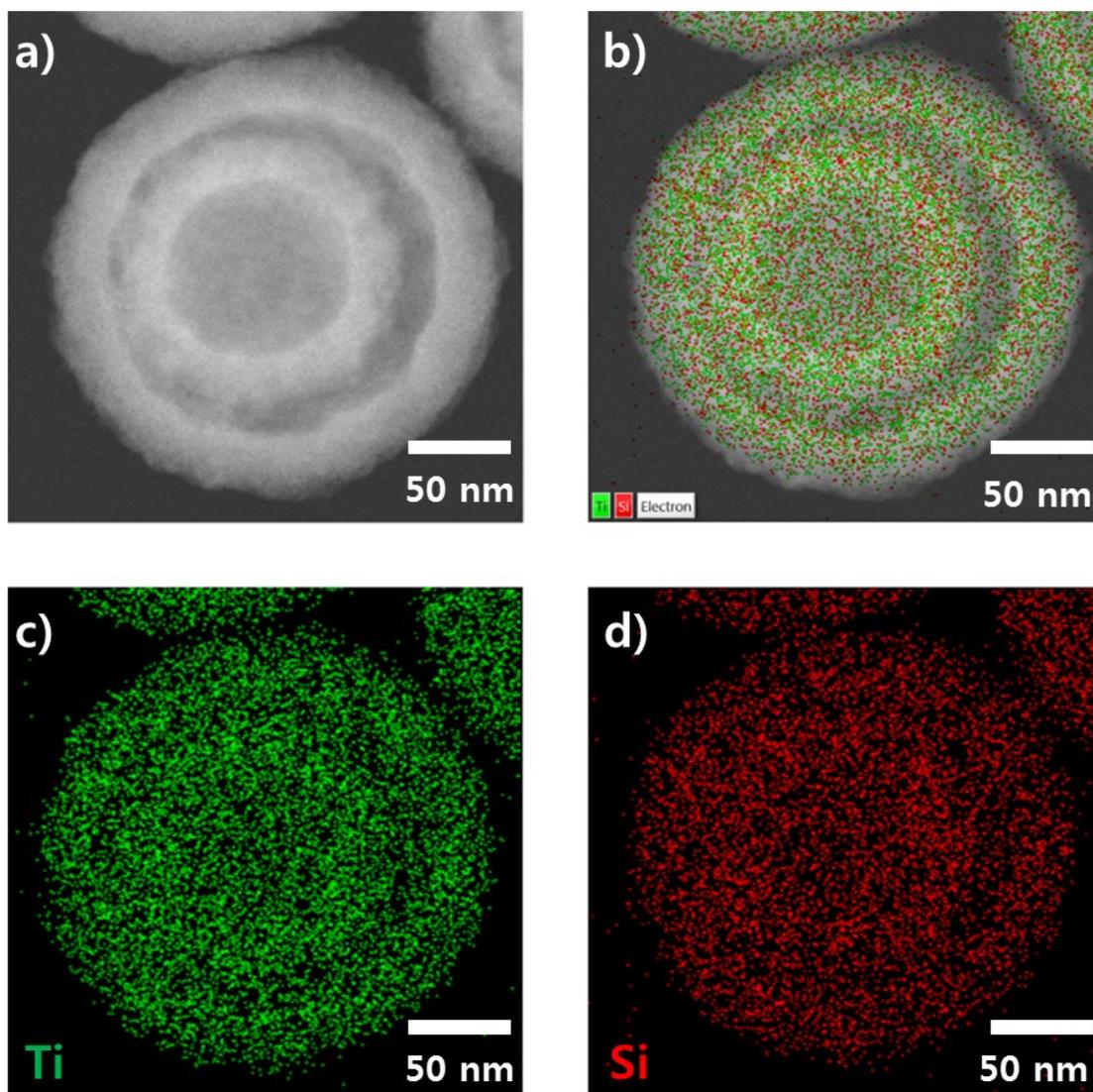


Figure S2. a) Scanning transmission electron microscopy (STEM) image of a silica/titania double-shell nanoparticle (ST DS-HNP) and the corresponding elemental dot maps for b) Ti and Si, c) Ti and d) Si.

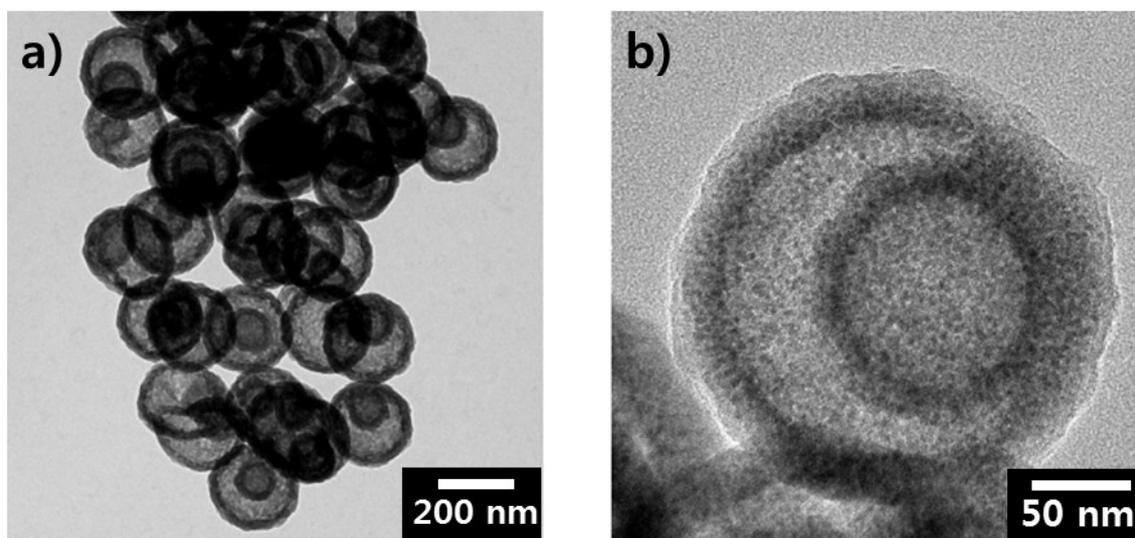


Figure S3. a) Transmission electron microscopy (TEM) image and b) high-resolution TEM (HR-TEM) image of nitrogen-doped carbon double-shell nanoparticles (NC DS-HNPs).

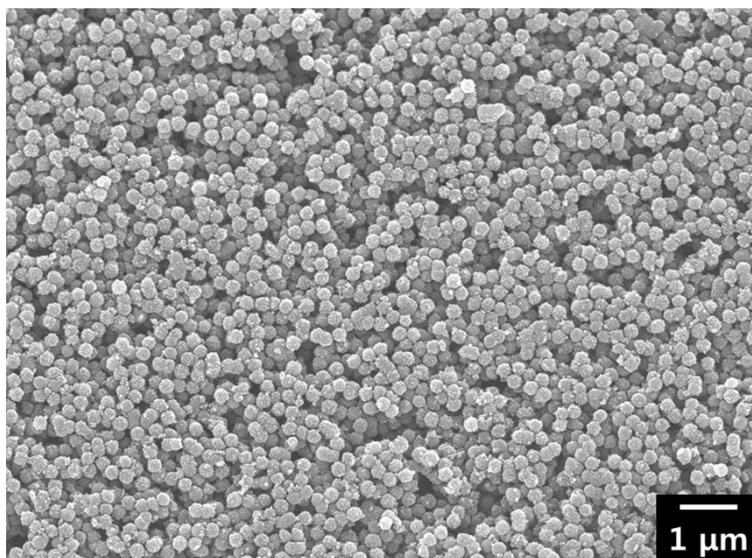


Figure S4. Low-magnification FE-SEM image of NC DS-HNPs

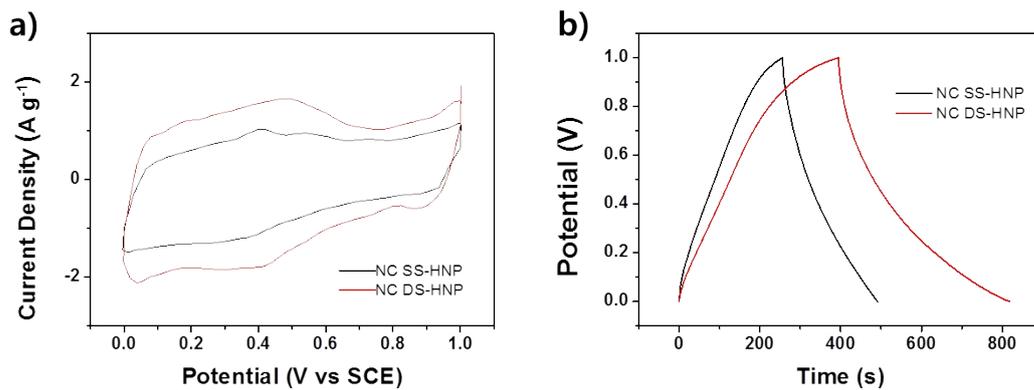


Figure S5. a) CV curves of NC SS-HNP and NC DS-HNP at a scan rate 20 mV s^{-1} in $1\text{M H}_2\text{SO}_4$ solution and b) charge-discharge curves of NC SS-HNP and NC DS-HNP at current density of 0.5 A g^{-1} .

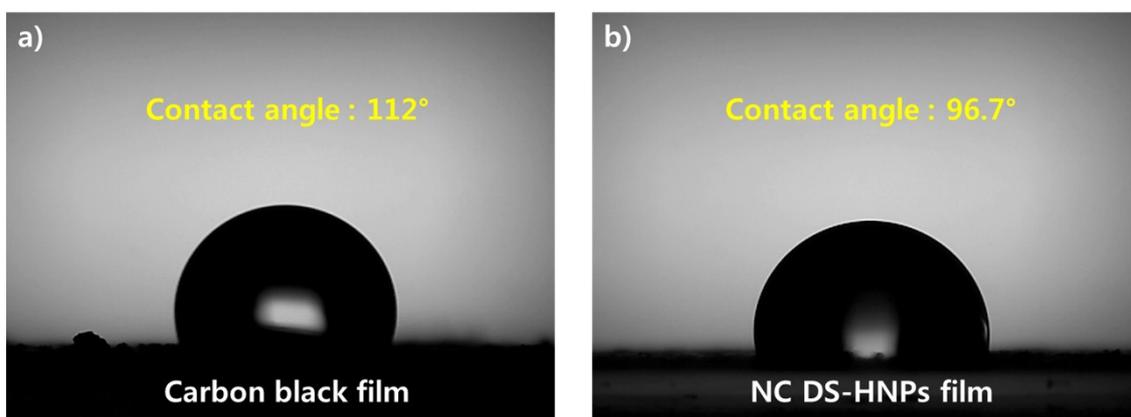


Figure S6. Water contact angle of a) carbon black film and b) NC DS-HNPs film.

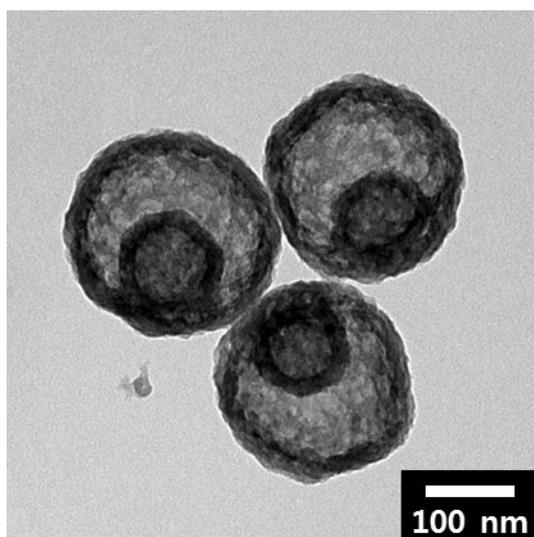


Figure S7. TEM image of NC DS-HNPs after 5000 cycles at a current density of 1 A g^{-1}

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Table S1 Pore characteristics of NC SS-HNPs and NC DS-HNPs.

Sample	S_{BET} ($\text{m}^2 \text{g}^{-1}$)	S_{Langmuir} ($\text{m}^2 \text{g}^{-1}$)	V_{pore} ($\text{cm}^3 \text{g}^{-1}$)	D_{ave} (nm)
NC SS-HNPs	511.21	702.83	0.88	7.4
NC DS-HNPs	873.52	1198.77	2.86	13.9