

Electronic Supplementary Information

One-step rapid synthesis of $\text{Ni}_6(\text{C}_{12}\text{H}_{25}\text{S})_{12}$ nanoclusters for electrochemical sensing of ascorbic acid

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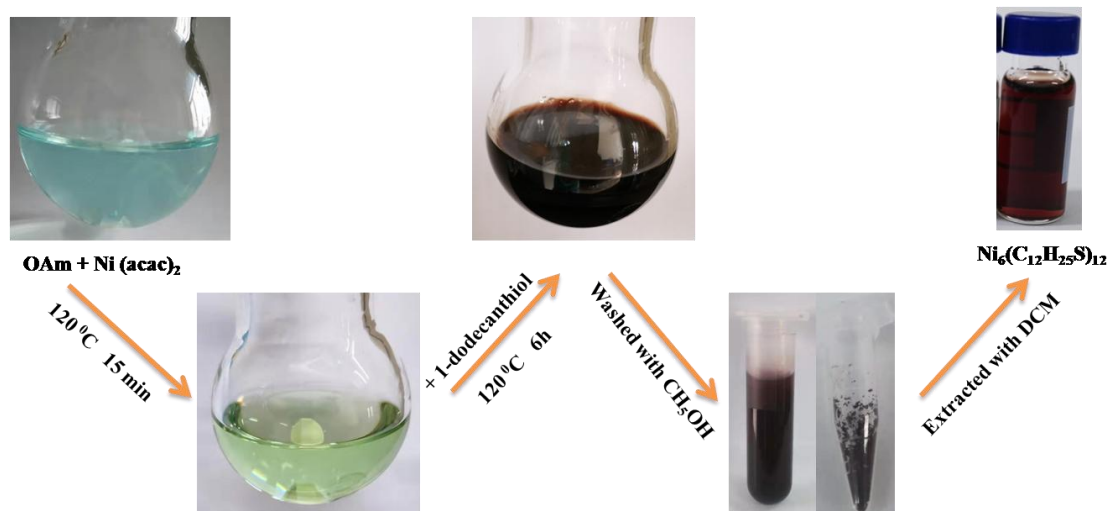


Fig. S1 Preparation process of Ni₆(C₁₂H₂₅S)₁₂ clusters.

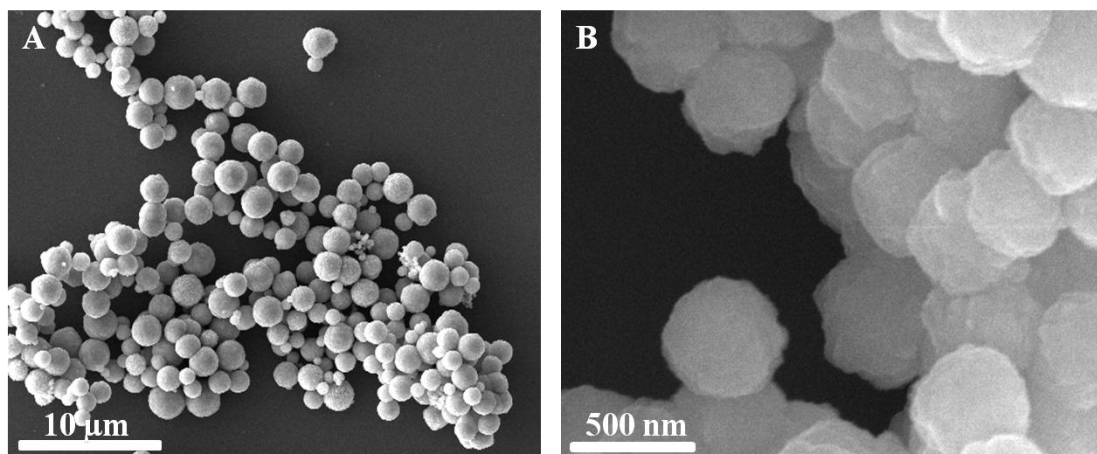


Fig. S2 (A-B) Representative SEM images of the prepared Ni NPs at different magnifications.

Table S1 Crystal structure data and structure refinement for Ni₆ clusters

Identification code	Ni ₆ (SR) ₆
Empirical formula	C ₁₄₄ H ₃₀₀ Ni ₆ S ₆
Formula weight	2768.72 g/mol
Temperature	294 K
Wavelength	1.54178 Å
Crystal system	triclinic
Space group	P-1
Unit cell dimensions	a = 13.0353(6) Å α = 108.331(3) deg. b = 18.6391(9) Å β = 108.152(3) deg. c = 19.8731(10) Å γ = 101.306(3) deg.
Volume	4117.5(4) Å ³
Z	1
M _μ	2.461 mm ⁻¹
Calculated density	1.1117 g/cm ³
Radiation	Cu Kα (λ = 1.54184 Å)
F(000)	1524.0
Crystal size	0.231 x 0.126 x 0.017 mm
Index ranges	-11 ≤ h ≤ 11, -16 ≤ k ≤ 16, -17 ≤ l ≤ 17
2θ range for data collection	2.557 to 44.661°
Reflections collected	30754
Absorption correction	Multi-scan

Data / restraints / parameters	6536 / 20 / 730
Goodness-of-fit on F^2	0.832
Final R indices [$I \geq 2\sigma(I)$]	$R_1 = 0.0723$, $wR_2 = 0.1848$
Final R indexes [all data]	$R_1 = 0.1673$, $wR_2 = 0.2602$
Largest diff.peak/hole	0.445/-0.429 e \AA^{-3}

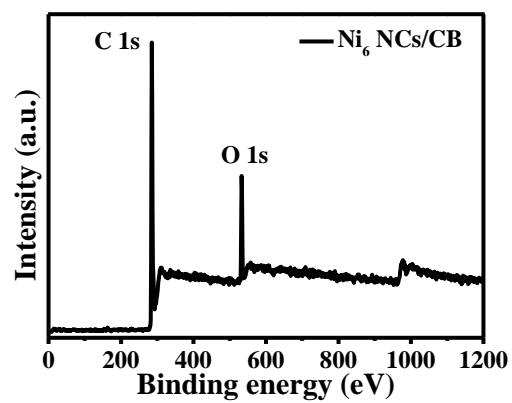


Fig. S3 XPS full spectrum of Ni₆ NCs/CB.

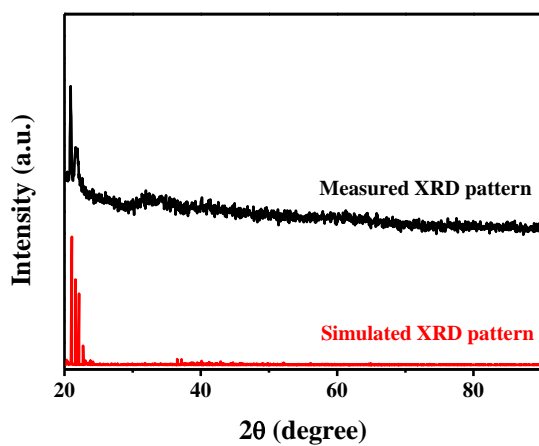


Fig. S4 Measured and simulated XRD patterns of the Ni₆ NCs in the 2θ range of 20~90 degree.

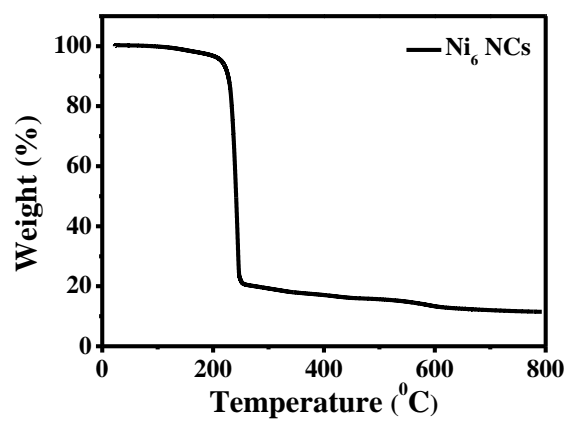


Fig. S5 TGA of Ni₆(C₁₂H₂₅S)₁₂.

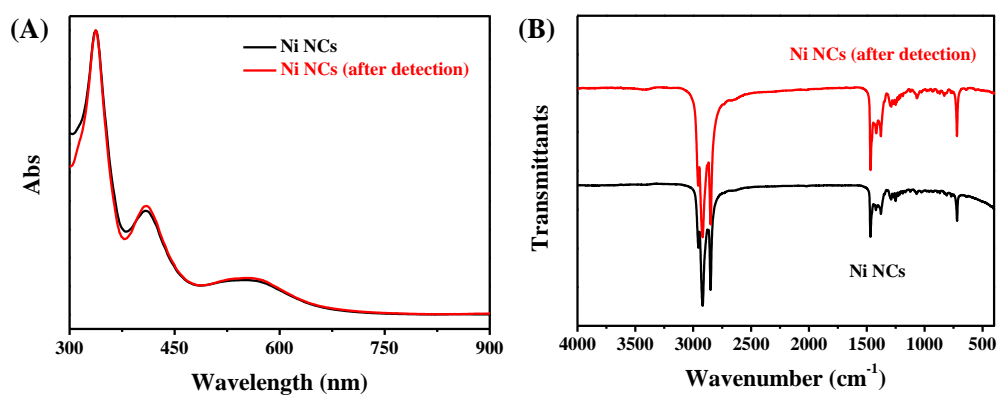


Fig. S6 (A) UV-Vis absorption spectra and (B) FTIR spectra of the Ni₆ NCs before (black) and after electrochemical detection of AA (red).

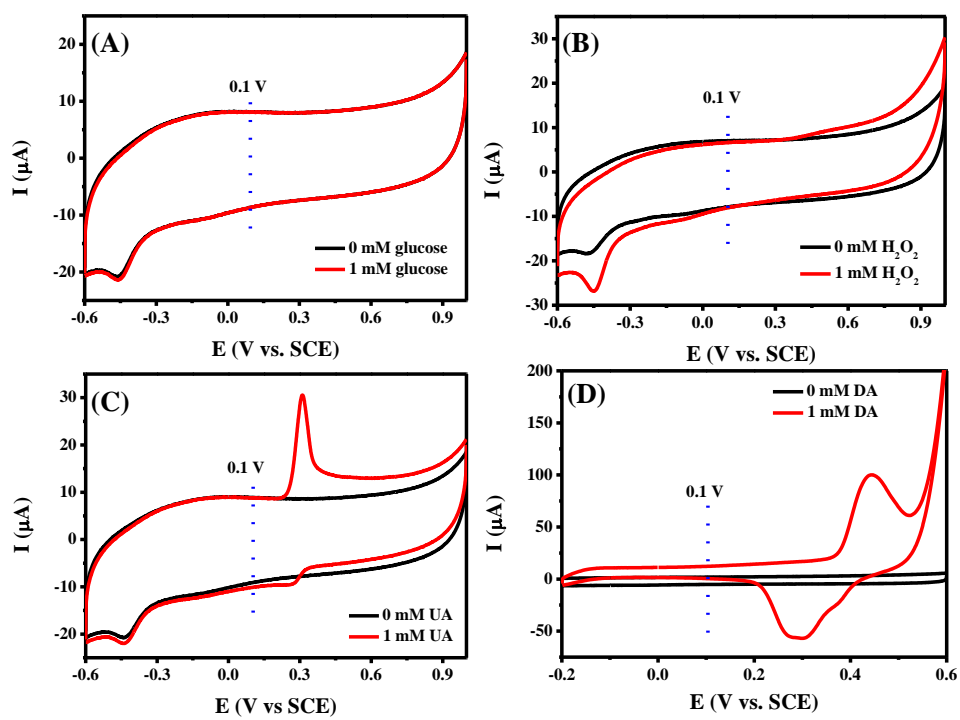


Fig. S7 CVs of the Ni₆ NCs/CB in 0.1 M PBS (pH = 7.0) with the presence of 1 mM glucose (A), H₂O₂ (B), UA (C) and (D) DA, potential scan rate 100 mV s⁻¹.

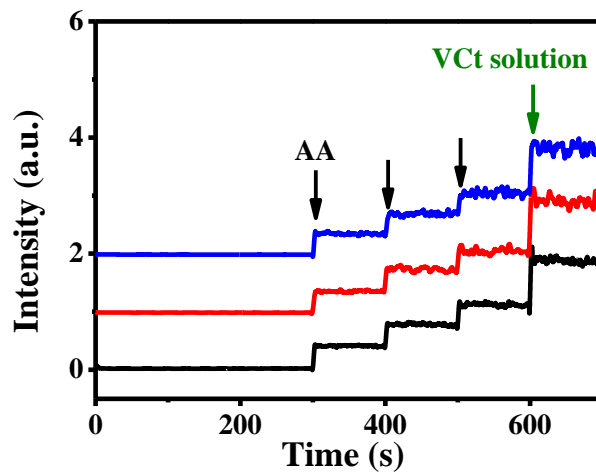


Fig. S8 Amperometric responses of the Ni₆ NCs/CB in N₂-saturated PBS with the presence of commercial vitamin C tablet solution at 0.1 V. The responses from three experiments are similar, indicating the good detection reproducibility of Ni₆ NCs/CB.