Electronic Supplementary Material (ESI) for RSC Advances.

Suuplementary Information

Super-hierarchical Ni/Porous-Ni/V_2O_5 Nanocomposites

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Calculation of the specific surface area of the as-cleaned Ni:

The as-cleaned Ni sheet (0.5 cm × 1.0 cm, 0.13 mm thick) can be considered as a cuboid with six flat surface. Then the total surface area for each piece of as-cleaned Ni sheet can be expressed as:

$$S_{\text{total}} = 2 \times (0.5 \times 1.0 + 0.5 \times 0.013 + 1.0 \times 0.013) = 1.039\ \text{cm}^2 \quad (1)$$

For this piece of as-cleaned Ni sheet, the total mass can be derived as:

$$m_{\text{total}} = \rho_{\text{Ni}} V_{\text{total}} = 8.902 \times (0.5 \times 1.0 \times 0.013) = 0.05786\ \text{g} \quad (2)$$

Then, the specific surface area of the as-cleaned Ni sheet is:

$$A_{\text{s-Ni}} = \frac{S_{\text{total}}}{m_{\text{total}}} = \frac{1.039 \times 10^{-4}}{0.05786} = 1.80 \times 10^{-3}\ \text{m}^2/\text{g} \quad (2)$$

Supporting figures:

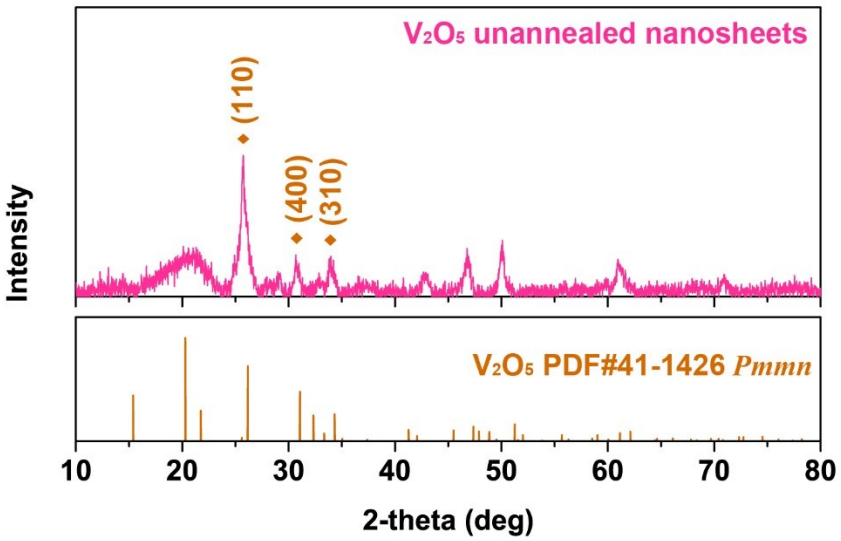

Figure S1: The XRD pattern of the unannealed V_2O_5 dried powders.

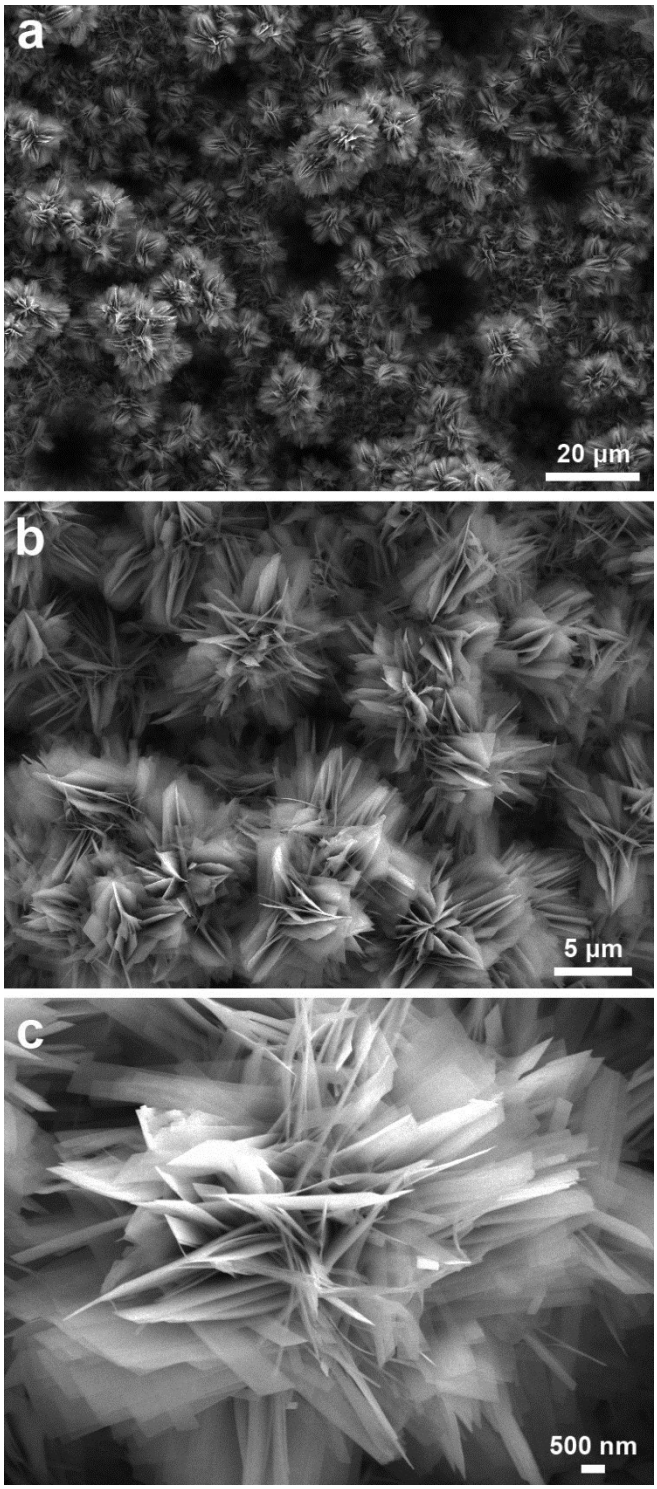

Figure S2: The SEM photographs of unannealed Ni/Porous-Ni/V_2O_5 nanocomposites at various magnifications. (a) 1500x; (b) 5000x; (c) 15000x.

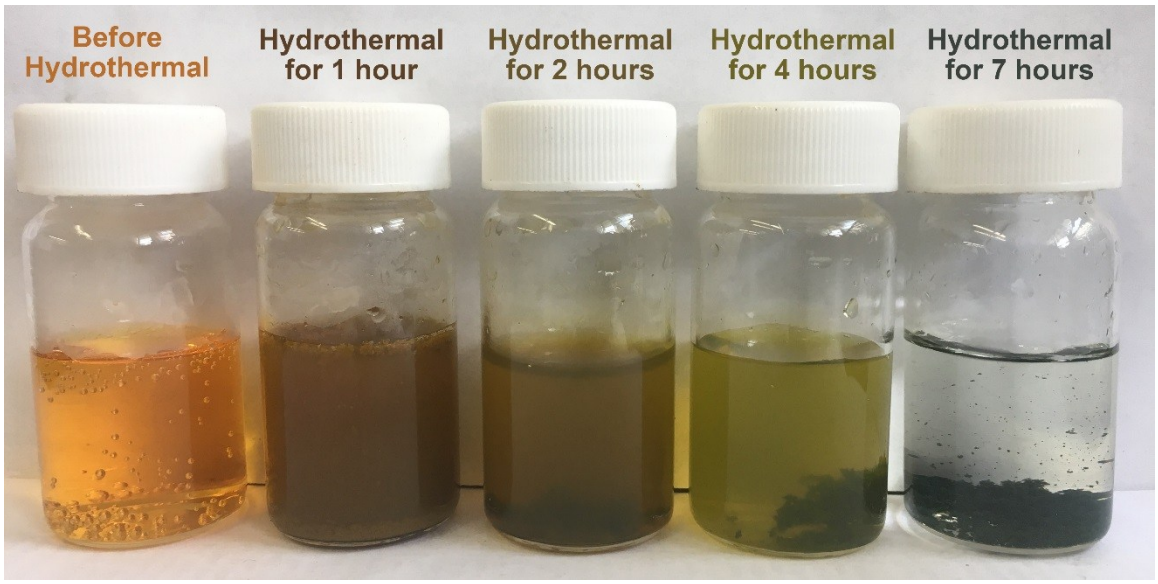

Figure S3: The digital camera photograph of the time-dependent hydrothermal treatment at 200 °C. Different vials from left to right enclose the as-reacted solution/suspension of before hydrothermal, after hydrothermal for 1, 2, 4, and 7 hours. Note that there are some bubbles in the solution before hydrothermal process. More and more solid precipitations along with an increasing of the transparency of the suspension after hydrothermal treatment are also observed.