

Electronic Supplementary Material (ESI) for Chemical Science.
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Supplementary Information

Template- and surfactant-free synthesis of ultrathin CeO₂ nanowires in mixed solvent and their superior adsorption capability for water treatment[†]

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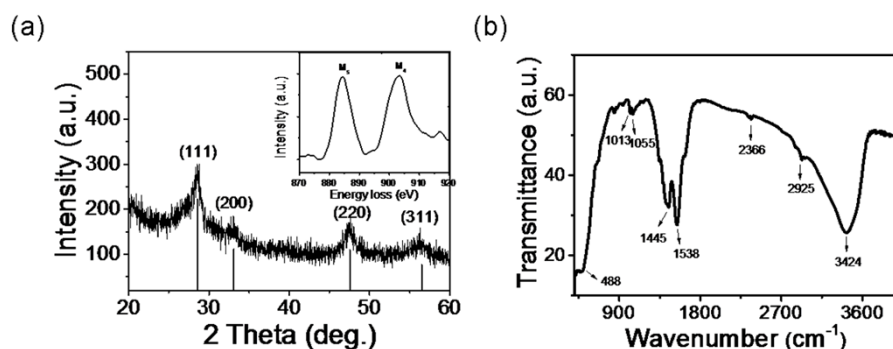


Fig. S1 a) X-ray diffraction (XRD) pattern of as-synthesized nanowires and Ce $M_{4,5}$ -edge EELS spectra of CeO_2 nanowires (inset), which corresponded to valence states of Ce^{4+} ; b) FT-IR spectrum of as-synthesized CeO_2 nanowires.

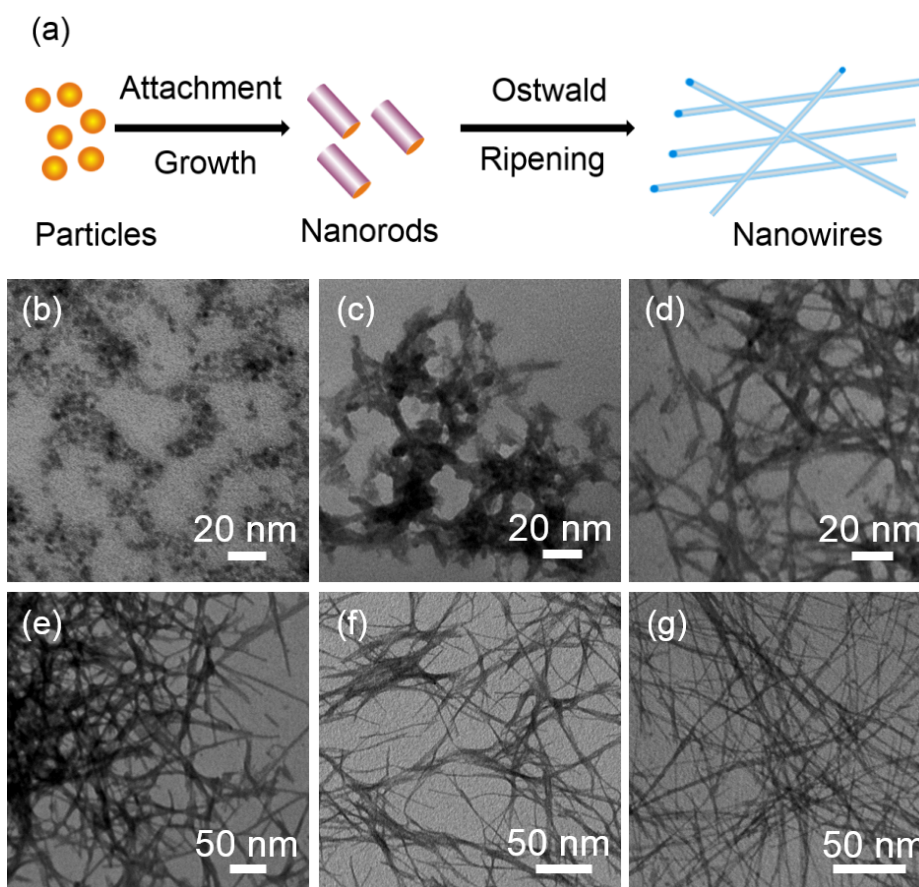


Fig. S2 a) Schematic diagram of ultrathin CeO_2 nanowires formation by attached growth followed by Ostwald ripening; b-g) TEM of as-synthesized ceria nanowires with different reaction times, from b to g the reaction time is a) before dropping $\text{NH}_3 \cdot \text{H}_2\text{O}$, b-f) after dropping $\text{NH}_3 \cdot \text{H}_2\text{O}$ for 0, 1, 3, 6 and 12 h.

Table S1 Summary of maximum adsorption capacities (Q_m) for Congo Red on various adsorbents.

Type of adsorbent	Q_m (mg/g)	Reference
Mesoporous Fe_2O_3	53	1
MnO_2 hierarchical hollow nanostructures	80	2
TiO_2	31.7	3
Hierarchical hollow $FeOOH$	275	4
Hierarchical MgO	2409	5
NiO nanospheres	440	6
Hierarchical hollow structure ZnO	97	7
CeO_2 nanowire arrays	987	8
Hierarchical CeO_2 nanospheres	942.7	9
Ultrathin CeO_2 NWs	2382.75	Present study

Table S2 Summary of maximum adsorption capacities of NMOs (nanosize metal oxides) for heavy metal ions.

NMOs	Pb	Cu	Cr	Cd
TiO_2	81.3 ¹⁰		9.93 ¹¹	15.2 ¹⁰
ZrO_2			17.17 ¹¹	
30Zr70Ti oxide			29.46 ¹¹	
Modified Al_2O_3	100 ¹²		100 ¹²	83.33 ¹²
ZnO	6.7 ¹³	1600 ¹⁴	5.11 ¹⁵	
$W_{18}O_{49}$	192 ¹⁶			
Commercial CeO_2		0.37 ¹⁷		
CeO_2	9.2 ¹⁸	15.4 ¹⁸	5.8 ¹⁷	
Present study	641.7	518	28.5	222

Notes and references

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