

NiSe₂/CeO₂ catalysts from Ce-UiO-66 metal-organic skeleton and their electrocatalytic oxidation of methanol, urea and glycerol

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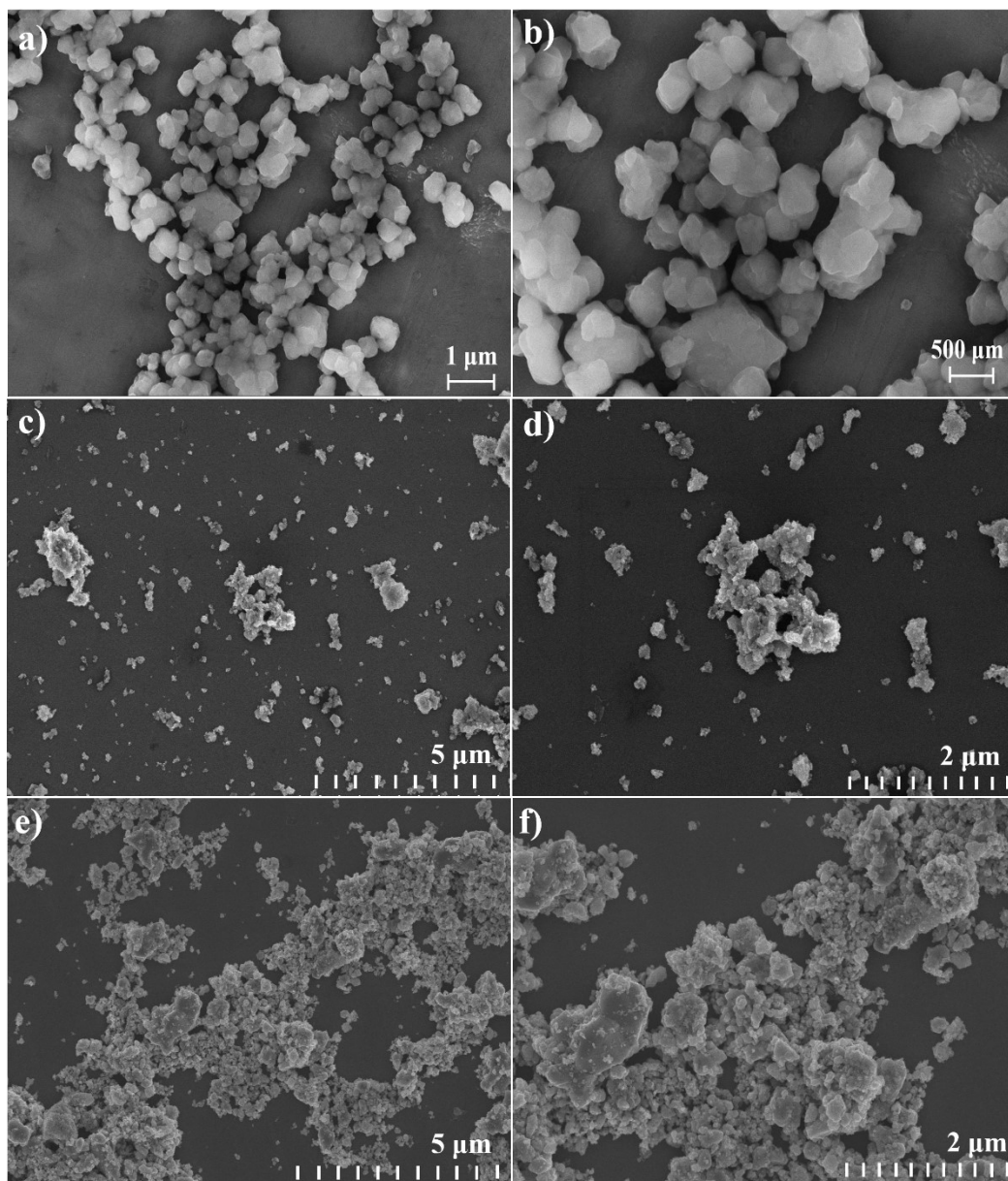


Fig S1. SEM images of the Ce-UiO-66 (a,b), Ni/CeO₂ (c,d), NiSe₂/CeO₂-450 °C (e,f) catalysts.

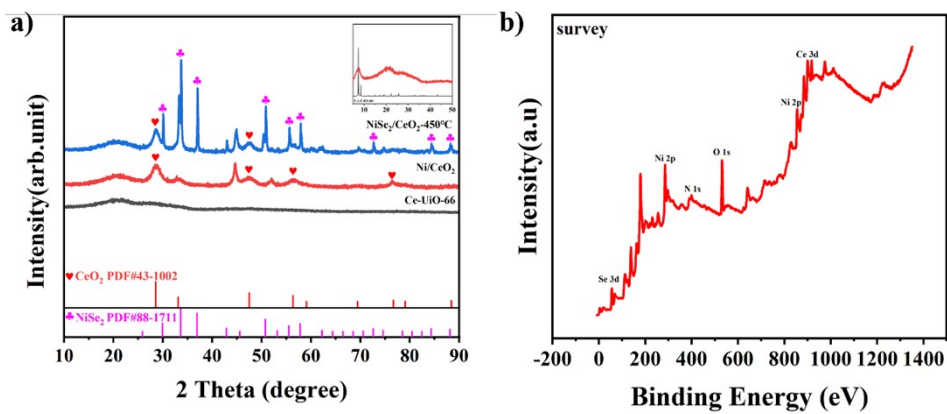


Fig S2. (a) XRD patterns of NiSe₂/CeO₂-450 °C, Ni/CeO₂ and Ce-UiO-66 (the inset shows the XRD patterns of Ce-UiO-66); (b) XPS spectrum tests of Survey.

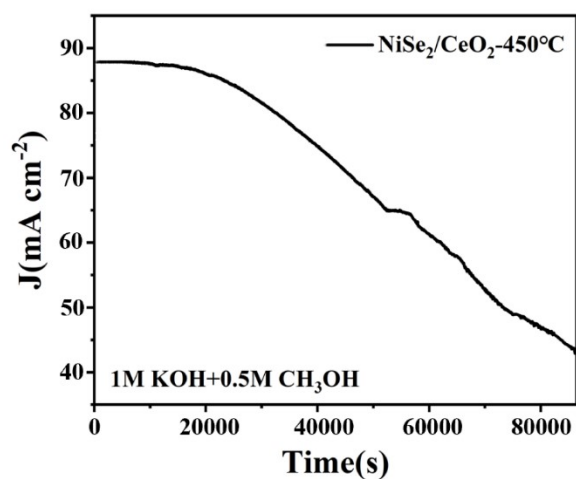


Fig S3. Chrono-current profile of NiSe₂/CeO₂-450 °C sample in 0.5 M methanol at 1.5 V

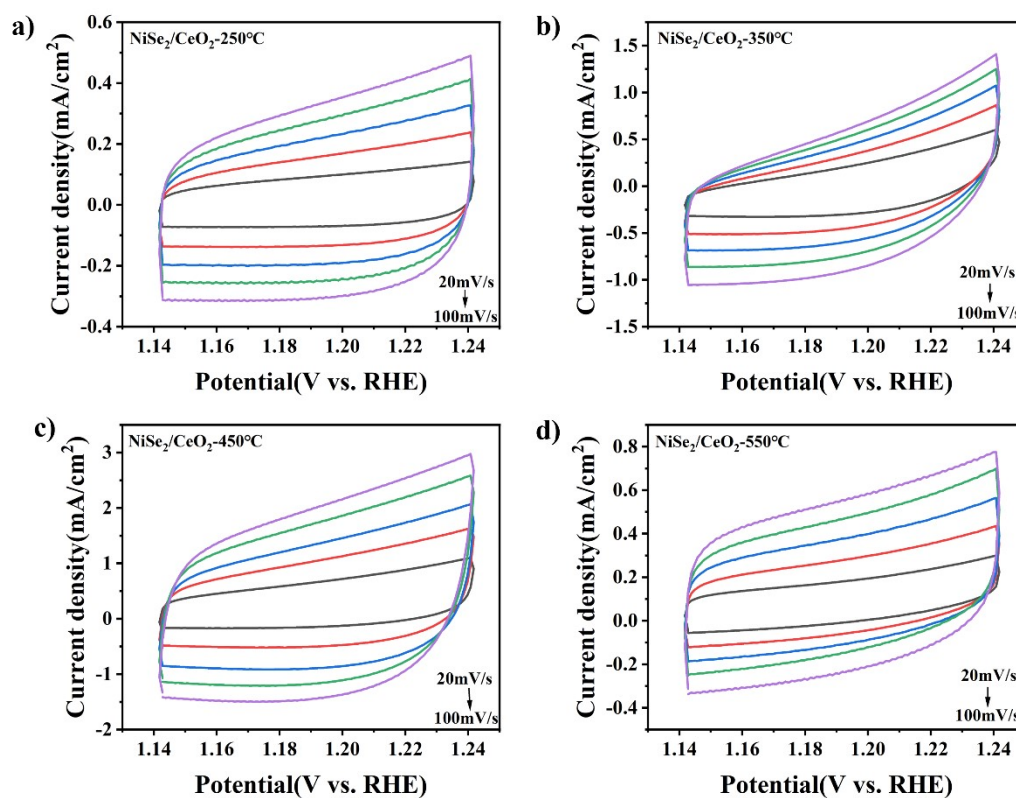


Fig S4. (a-d) NiSe₂/CeO₂-250 °C, NiSe₂/CeO₂-350 °C, NiSe₂/CeO₂-450 °C, and NiSe₂/CeO₂-550 °C at scan rate of 20, 40, 60, 80 and 100 mV s⁻¹ in 1 M KOH solution.

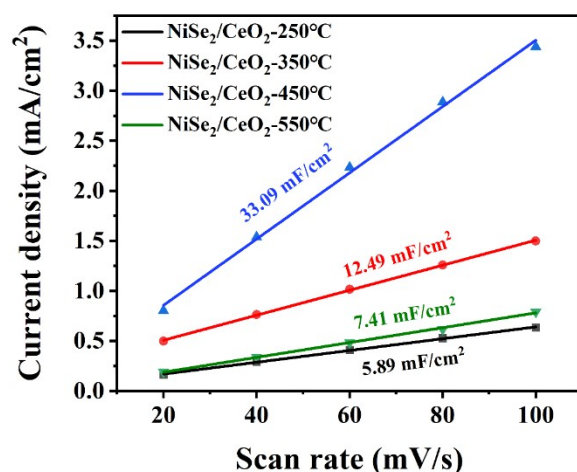


Fig S5. The C_{dl} of nickel based catalysts with $NiSe_2/CeO_2$ -250°C, $NiSe_2/CeO_2$ -350°C, $NiSe_2/CeO_2$ -450°C, and $NiSe_2/CeO_2$ -550°C.

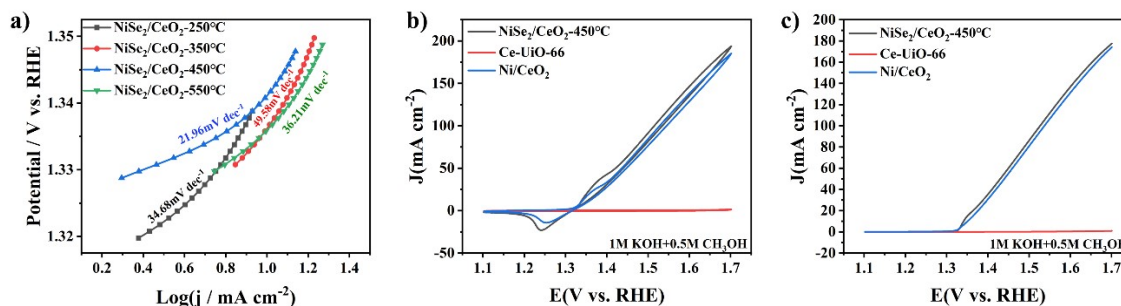


Fig S6. (a) The Tafel plots of different samples in methanol; (b) CVs of $NiSe_2/CeO_2$ -450°C, Ce-UiO-66 and Ni/CeO₂ in 1 M KOH containing 0.5 M MeOH. (c) LSV of $NiSe_2/CeO_2$ -450°C, Ce-UiO-66 and Ni/CeO₂ in 1M KOH containing 0.5 M MeOH (sweep speed: 50 mV s⁻¹).

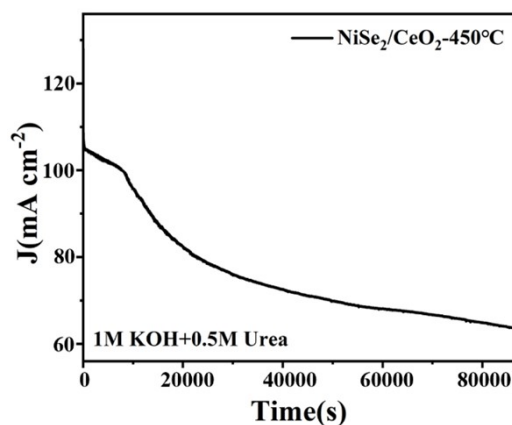


Fig S7. Chrono-current profile of $NiSe_2/CeO_2$ -450 °C sample in 0.5 M Urea at 1.5 V

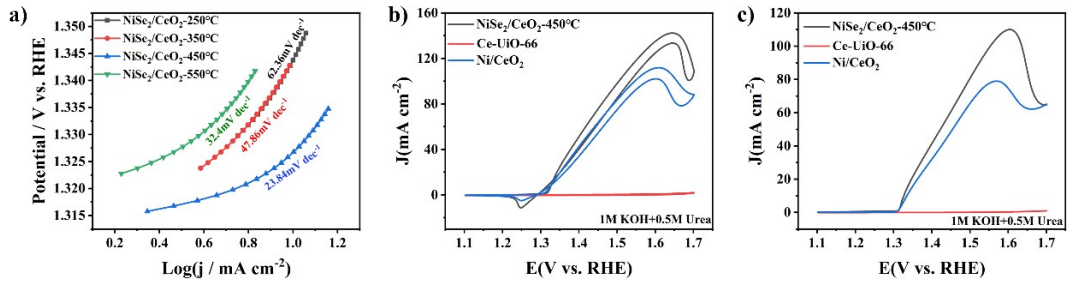


Fig S8. (a) The Tafel plots of different samples in urea oxidation; (b) CVs of NiSe₂/CeO₂-450°C, Ce-UiO-66 and Ni/CeO₂ in 1 M KOH containing 0.5 M urea. (c) LSV of NiSe₂/CeO₂-450°C, Ce-UiO-66 and Ni/CeO₂ in 1M KOH containing 0.5 M urea (sweep speed: 50 mV s⁻¹).

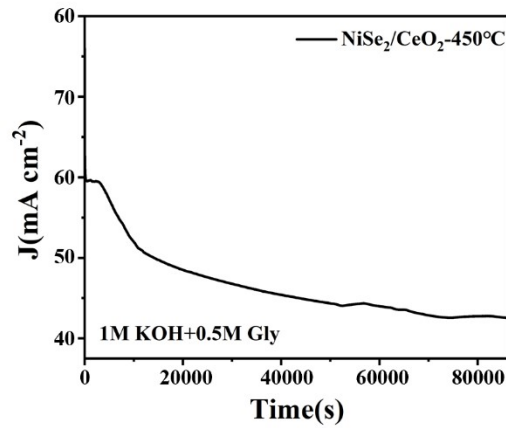


Fig S9. Chrono-current profile of NiSe₂/CeO₂-450 °C sample in 0.5 M Glycerol at 1.5 V

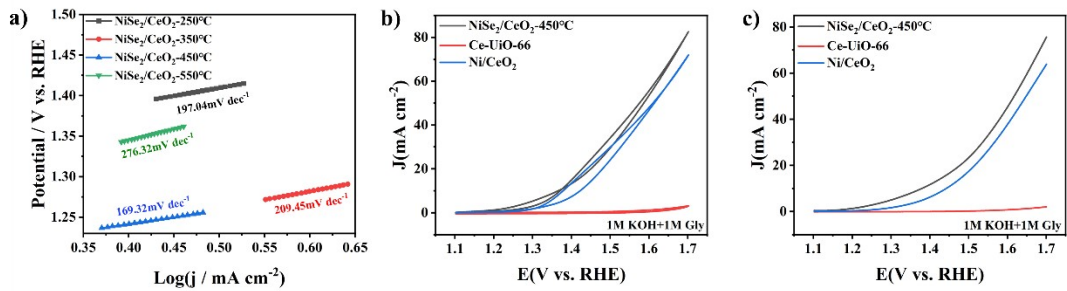


Fig S10. (a) The Tafel plots of different samples in glycerol oxidation; (b) CVs of NiSe₂/CeO₂-450°C, Ce-UiO-66 and Ni/CeO₂ in 1 M KOH containing 1 M glycerol. (c) LSV of NiSe₂/CeO₂-450°C, Ce-UiO-66 and Ni/CeO₂ in 1M KOH containing 1 M glycerol (sweep speed: 50 mV s⁻¹).