

Supplementary Materials

Enhanced Performance of Nickel–Cobalt Oxides as Selective Coatings for Flat-Plate Solar Thermal Collector Applications

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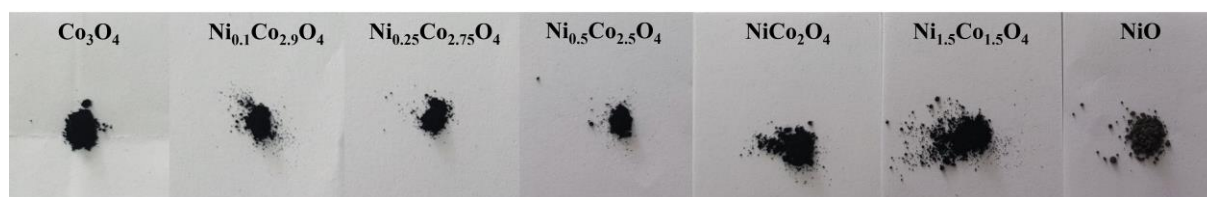


Figure S1. Photographs of all synthesized powders thermally treated at 500 °C.

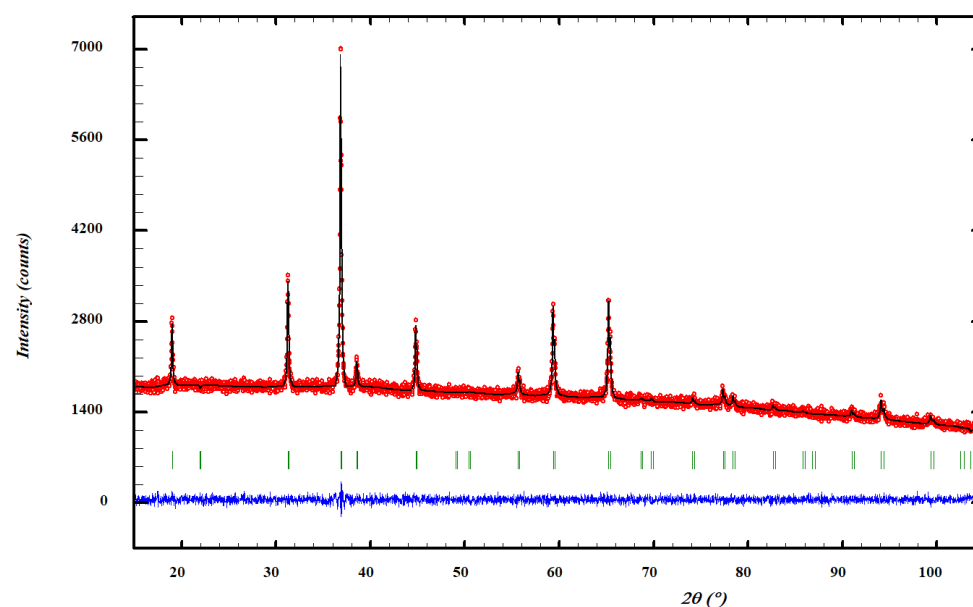


Figure S2. XRD powder pattern experimental (red), calculated (black) and profile fitting difference (blue) for the Le Bail refinement of the composition Co_3O_4 . Green bars correspond to Bragg positions.

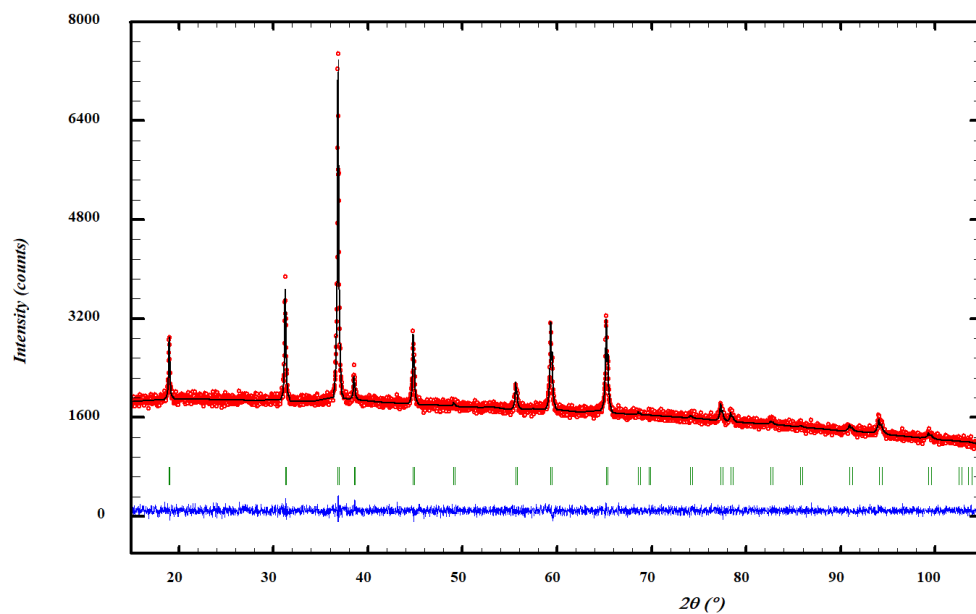


Figure S3. XRD powder pattern experimental (red), calculated (black) and profile fitting difference (blue) for the Le Bail refinement of the composition $\text{Ni}_{0.1}\text{Co}_{2.9}\text{O}_4$. Green bars correspond to Bragg positions.

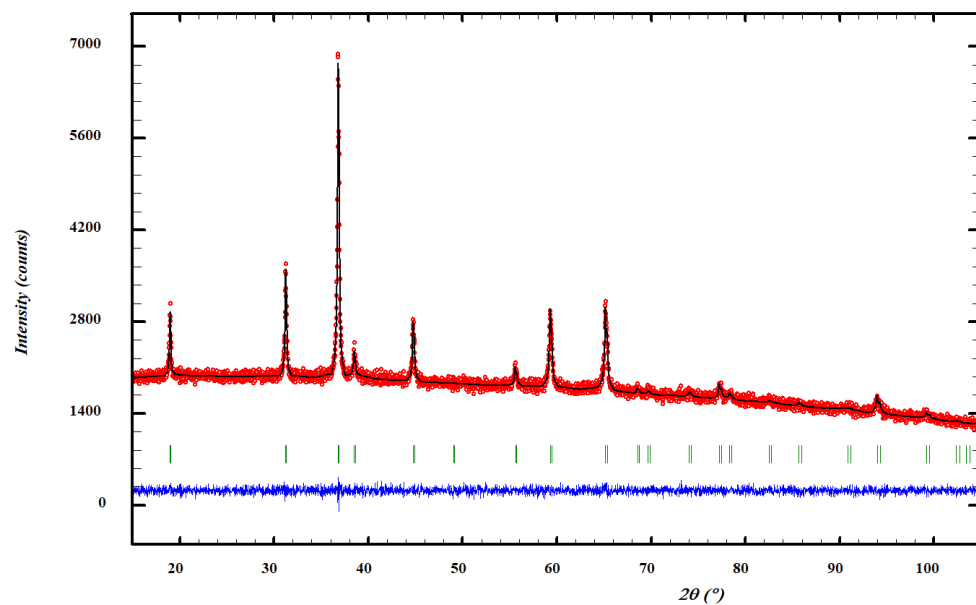


Figure S4. XRD powder pattern experimental (red), calculated (black) and profile fitting difference (blue) for the Le Bail refinement of the composition $\text{Ni}_{0.25}\text{Co}_{2.75}\text{O}_4$. Green bars correspond to Bragg positions.

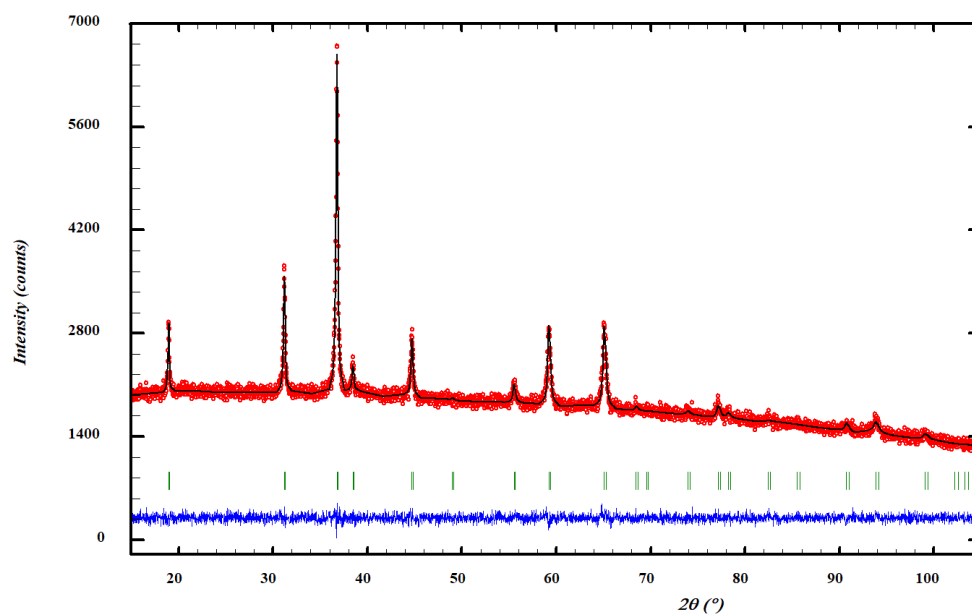


Figure S5. XRD powder pattern experimental (red), calculated (black) and profile fitting difference (blue) for the Le Bail refinement of the composition $\text{Ni}_{0.5}\text{Co}_{2.5}\text{O}_4$. Green bars correspond to Bragg positions.

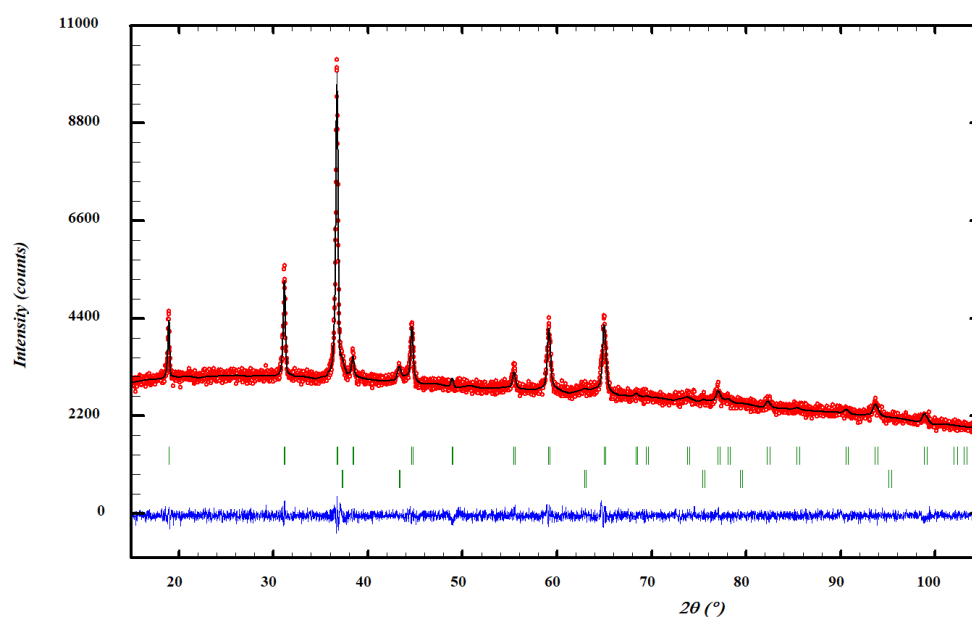


Figure S6. XRD powder pattern experimental (red), calculated (black) and profile fitting difference (blue) for the Rietveld refinement of the composition NiCo_2O_4 . Green bars correspond to Bragg positions. The determined phase percentage is 96.1 % for NiCo_2O_4 and 3.9 % for NiO .

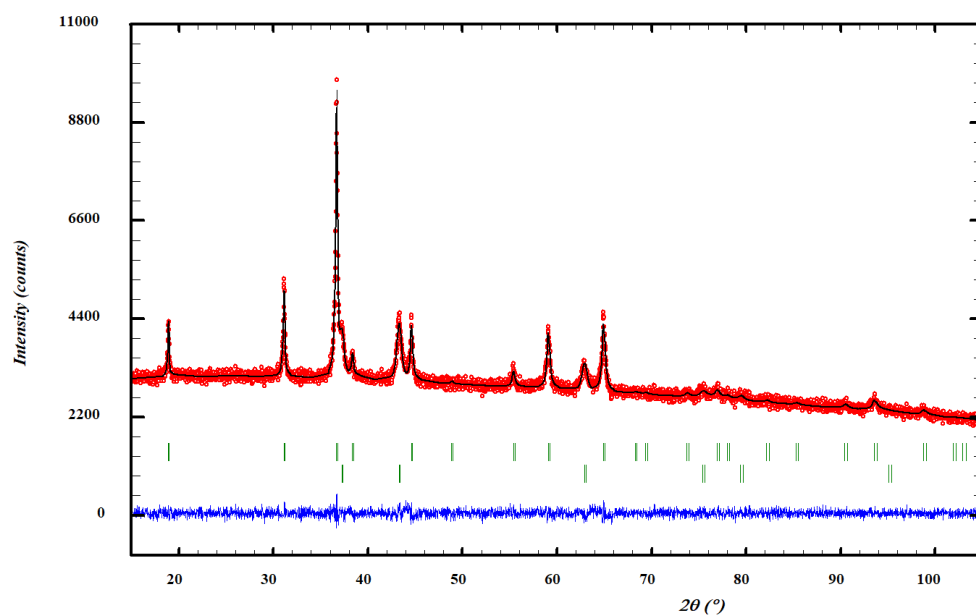


Figure S7. XRD powder pattern experimental (red), calculated (black) and profile fitting difference (blue) for the Rietveld refinement of the composition $\text{Ni}_{1.5}\text{Co}_{1.5}\text{O}_4$. Green bars correspond to Bragg positions. The determined phase percentage is 73.3 % for NiCo_2O_4 and 26.7 % for NiO .

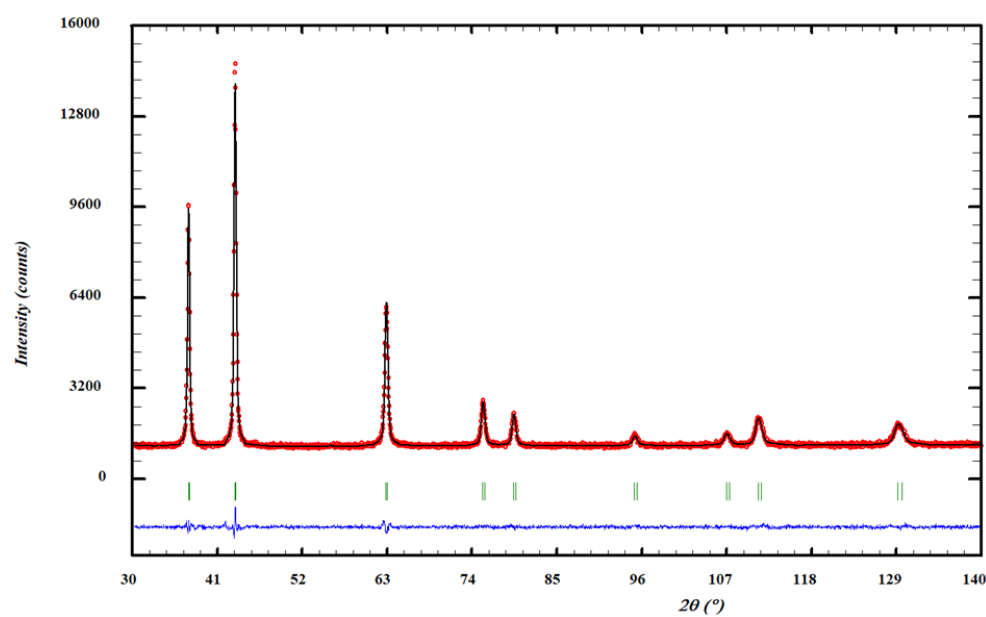


Figure S8. XRD powder pattern experimental (red), calculated (black) and profile fitting difference (blue) for the Le Bail refinement of the composition NiO . Green bars correspond to Bragg positions.

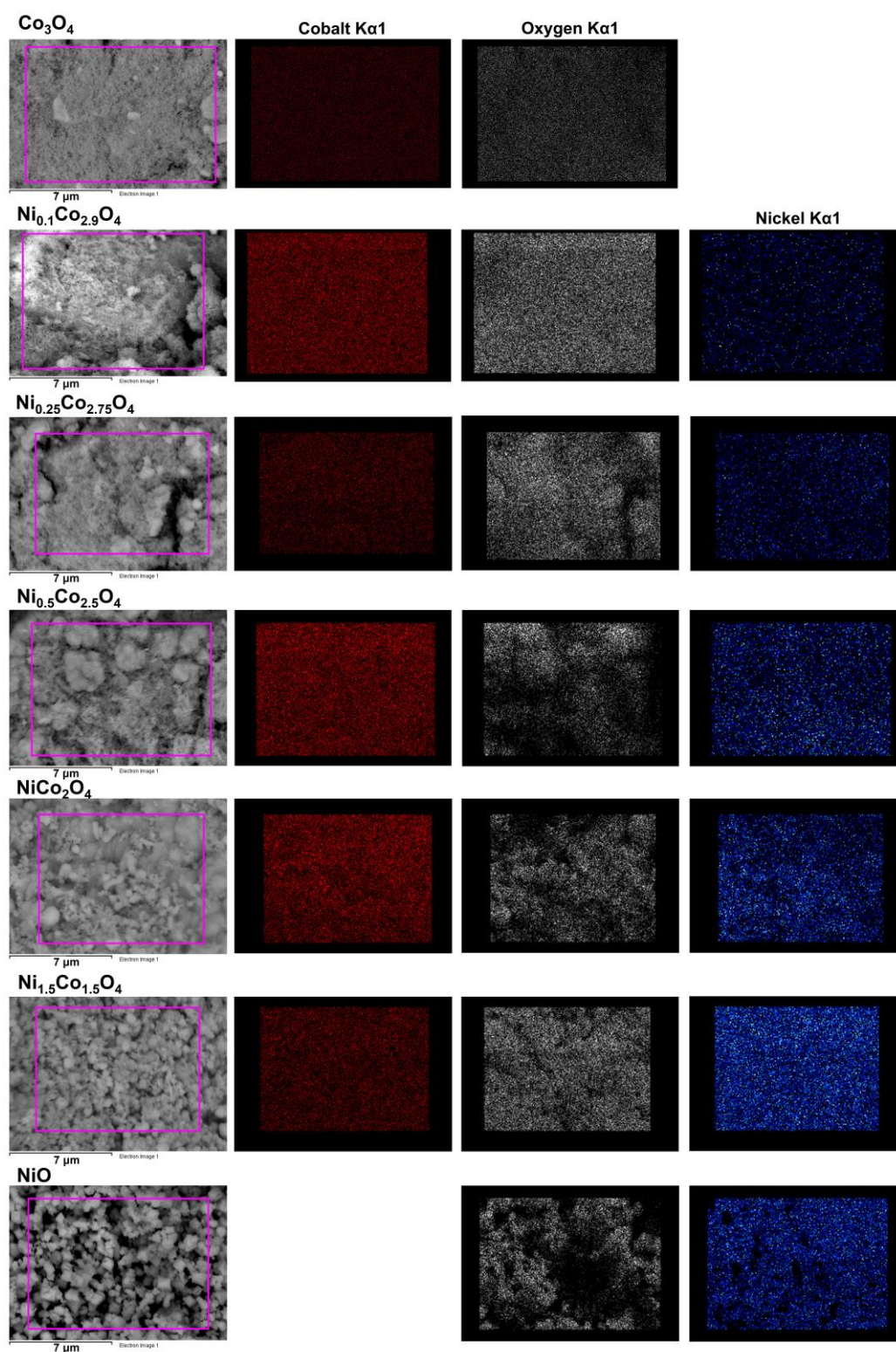


Figure S9. Representative SEM-EDS mappings for all synthesized samples.

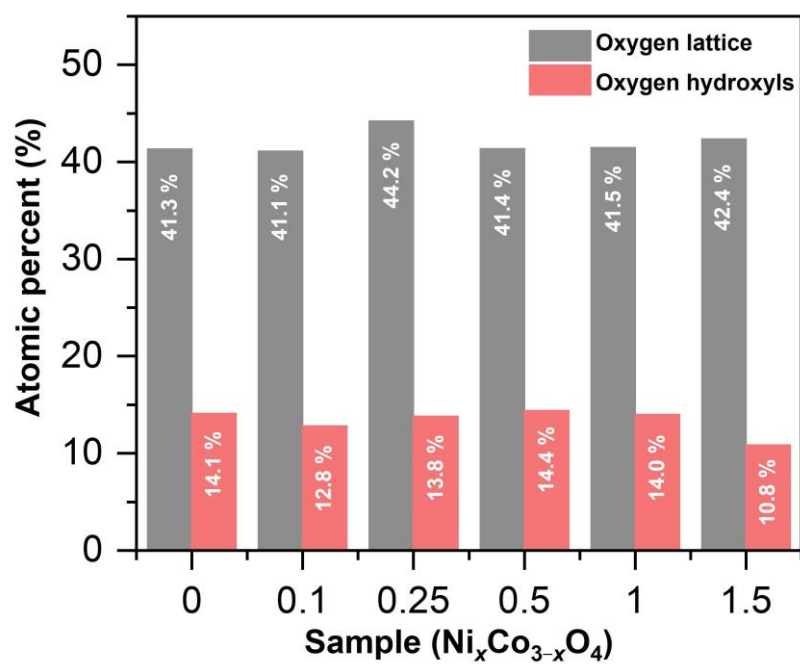


Figure S10. Atomic percent of surface oxygen obtained from XPS analysis for Co_3O_4 and $\text{Ni}_x\text{Co}_{3-x}\text{O}_4$ oxides.

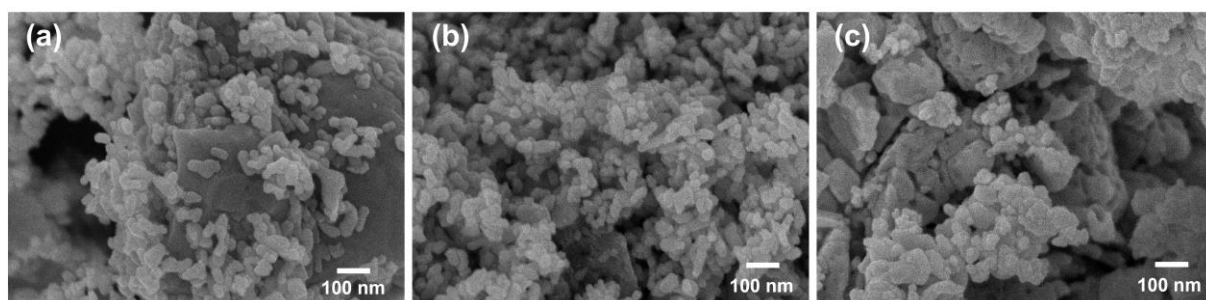


Figure S11. Representative SEM micrographs of selected samples: (a) $\text{Ni}_{0.1}\text{Co}_{2.9}\text{O}_4$, (b) $\text{Ni}_{0.5}\text{Co}_{2.5}\text{O}_4$ and (c) $\text{Ni}_{1.5}\text{Co}_{1.5}\text{O}_4$.

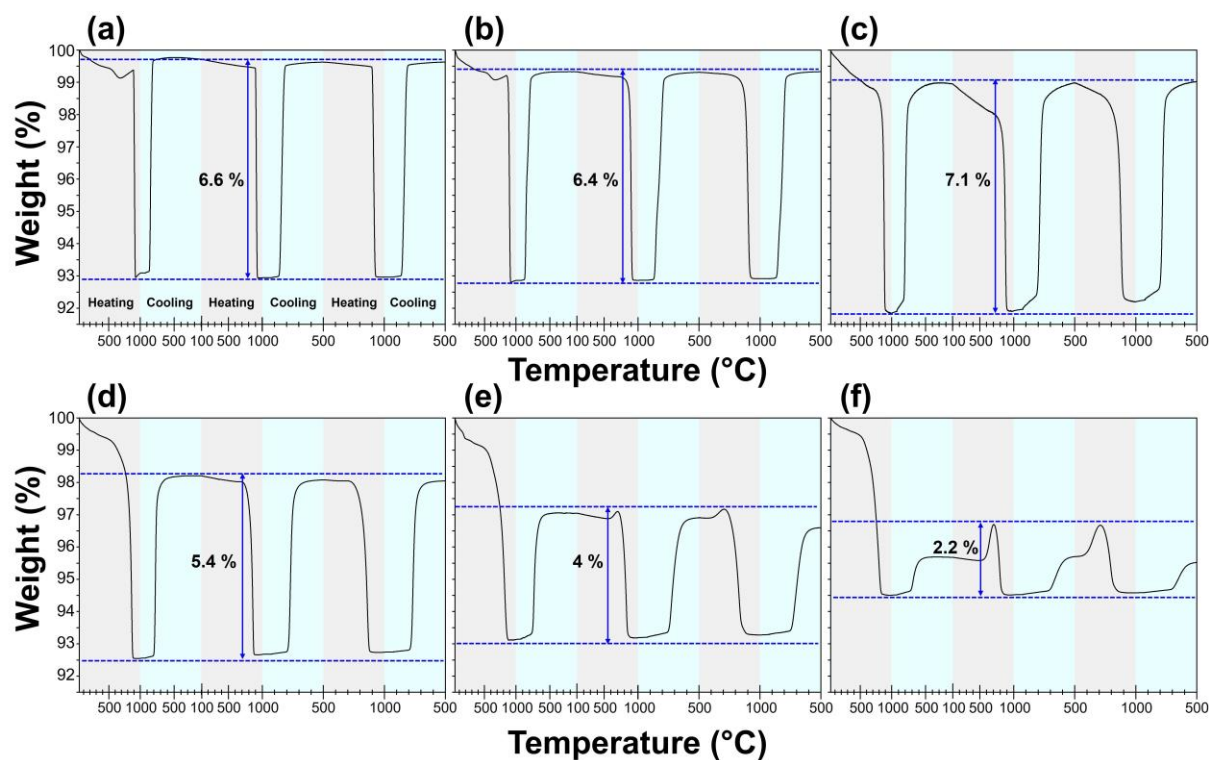


Figure S12. Comparative weight variation obtained at 5 °C/min without dwell during three heating-cooling cycles for (a) Co_3O_4 and $\text{Ni}_x\text{Co}_{3-x}\text{O}_4$ with $x =$ (b) 0.1, (c) 0.25, (d) 0.5, (e) 1.0 and (f) 1.5.

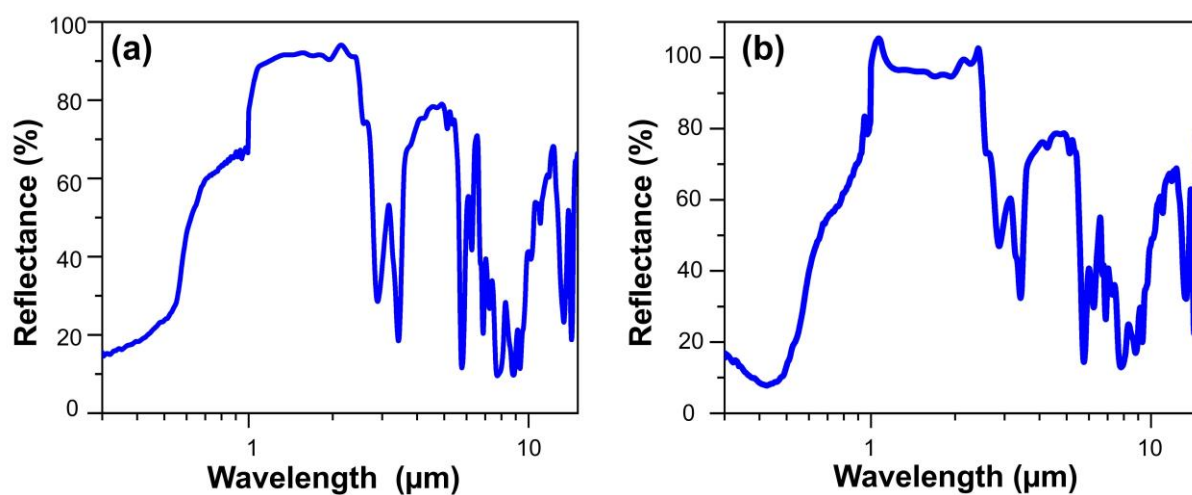


Figure S13. Reflectance spectra for polymeric resin on aluminum substrate: (a) as-painted and (b) thermal treated at 200 °C for 24 h.

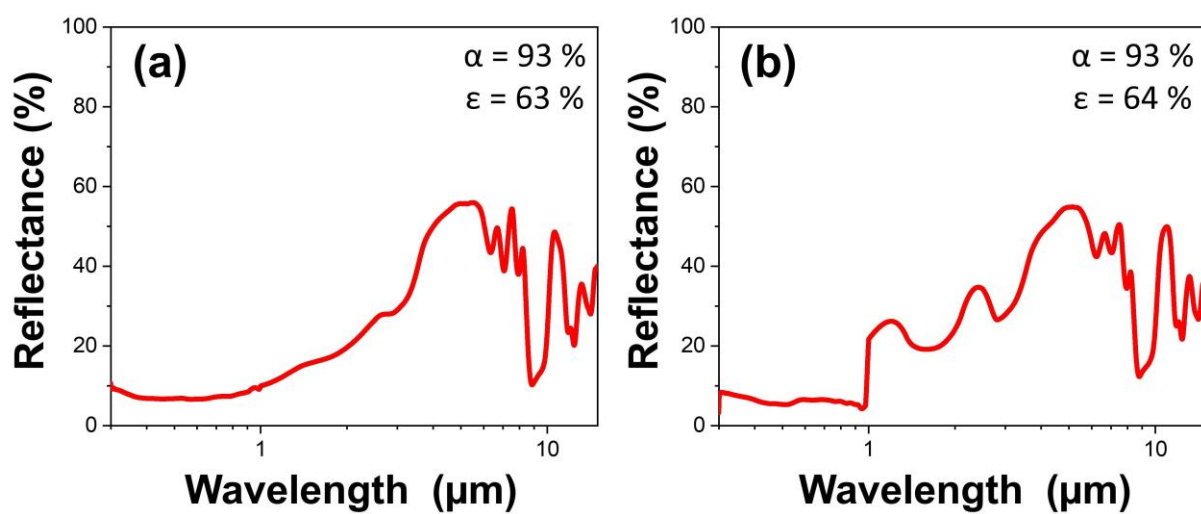


Figure S14. Reflectance spectra for two sets of brush-painted aluminum plates using the commercial paint Solkote®: (a) without thermal treatment and (b) thermal treated at 200 °C for 24 h..