

Figure S1. XRD plots of $\text{R}_{1.5}\text{Ca}_{0.5}\text{NiO}_4$ samples obtained at 1000 °C. Crystalline phases have been assigned based on following ICDD data: $\text{c-Sm}_2\text{O}_3$ (# 00-015-0813), $\text{c-Eu}_2\text{O}_3$ (# 00-034-0392), NiO (# 00-047-1049) and CaO (# 00-037-1497)

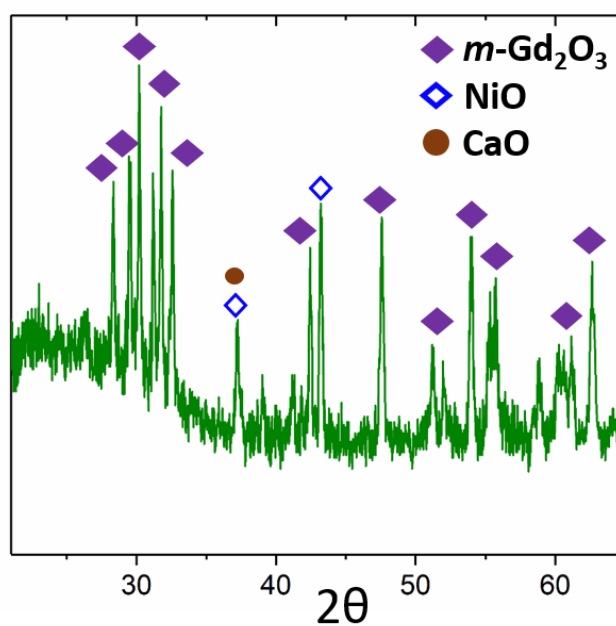


Figure S2. XRD plot of " $\text{Gd}_{1.5}\text{Ca}_{0.5}\text{NiO}_4$ " sample obtained at 1350 °C. Crystalline phases have been assigned based on following ICDD data: $m\text{-Gd}_2\text{O}_3$ (# 00-042-1465), NiO (# 00-047-1049) and CaO (# 00-037-1497)