

## Supplementary information

### Stability of $\text{NdBaCo}_{2-x}\text{Mn}_x\text{O}_{5+\delta}$ ( $x = 0, 0.5$ ) layered perovskites in humid conditions investigated by high-temperature *in situ* neutron powder diffraction

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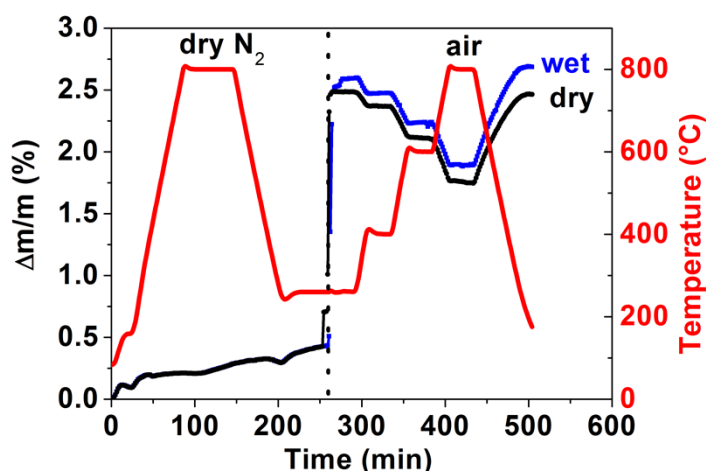


Figure S.I. 1. TGA of  $\text{NdBaCo}_{1.5}\text{Mn}_{0.5}\text{O}_{5+\delta}$  in dry  $\text{N}_2$  followed by (black) heating/cooling in dry air, (blue) heating/cooling in wet air ( $p\text{H}_2\text{O} = 0.6$  bar); heating/cooling rates are  $10^\circ\text{Cmin}^{-1}$ ; flow rate is 100 mL/min.

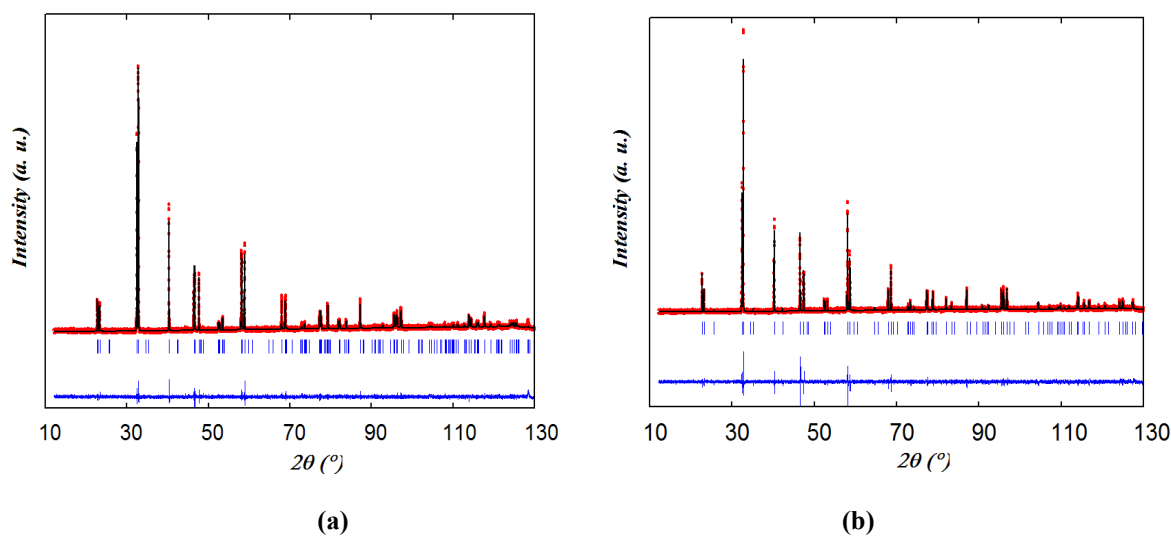


Figure S.I. 2. X-ray diffraction patterns at room temperature after heating/cooling cycles up to  $800^\circ\text{C}$  in wet ( $60\%\text{H}_2\text{O}$ ) air of the (a)  $x = 0$  sample, S.G.  $Pmmm$ ,  $a = 3.89048(1)$ ,  $b = 3.90430(1)$  and  $c = 7.61791(2)$  Å,  $V = 115.720(1)$  Å<sup>3</sup>,  $\chi^2 \sim 1.6$ , (b)  $x = 0.5$  sample, S.G.  $P4/mmm$ ,  $a = 3.89691(2)$  and  $c = 7.65564(4)$  Å,  $V = 116.258(2)$  Å<sup>3</sup>,  $\chi^2 \sim 1.8$ .

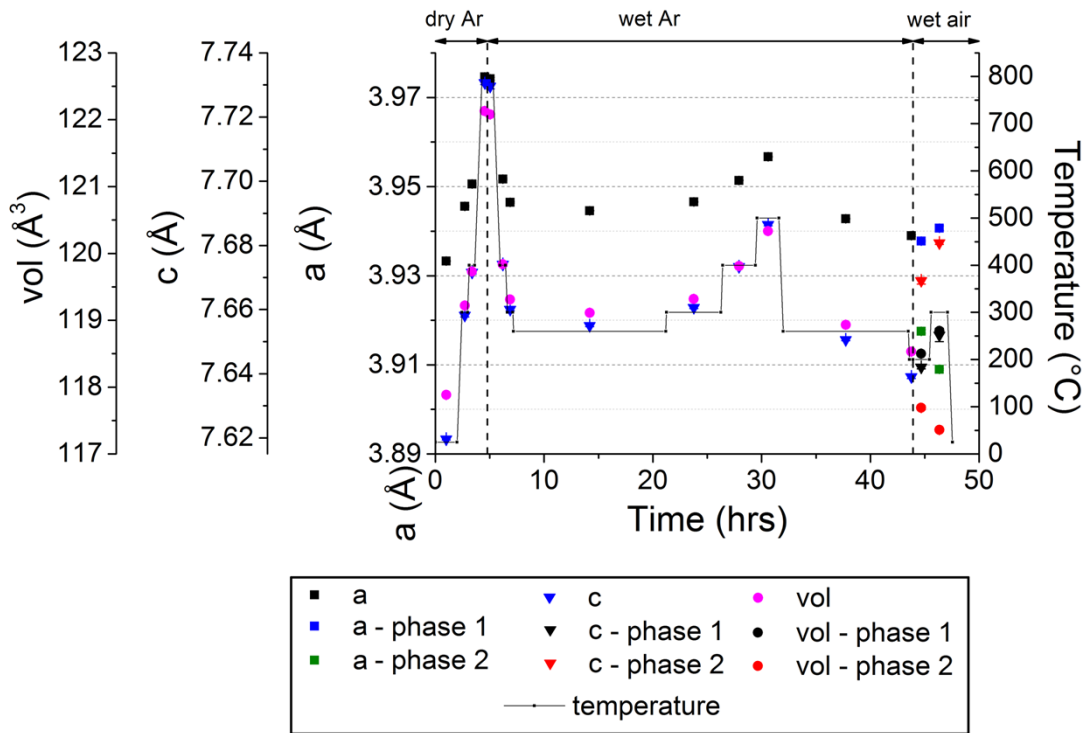


Figure S.I. 3. Refined  $a$ -lattice parameters and unit cell volume of  $\text{NdBaCo}_{1.5}\text{Mn}_{0.5}\text{O}_{5+\delta}$  ( $x = 0.5$ ) from neutron diffraction data.