†Electronic Supplementary Information (ESI) available:[Refined lattice parameters for $PrBaCo_{2-x}Fe_xO_{6-\delta}$ (x = 0-0.6) and variable temperature XRD data obtained for $PrBaCo_2O_{6-\delta}$ at pO_2=10^{-4} atm]. See DOI: 10.1039/c4dt00847b/

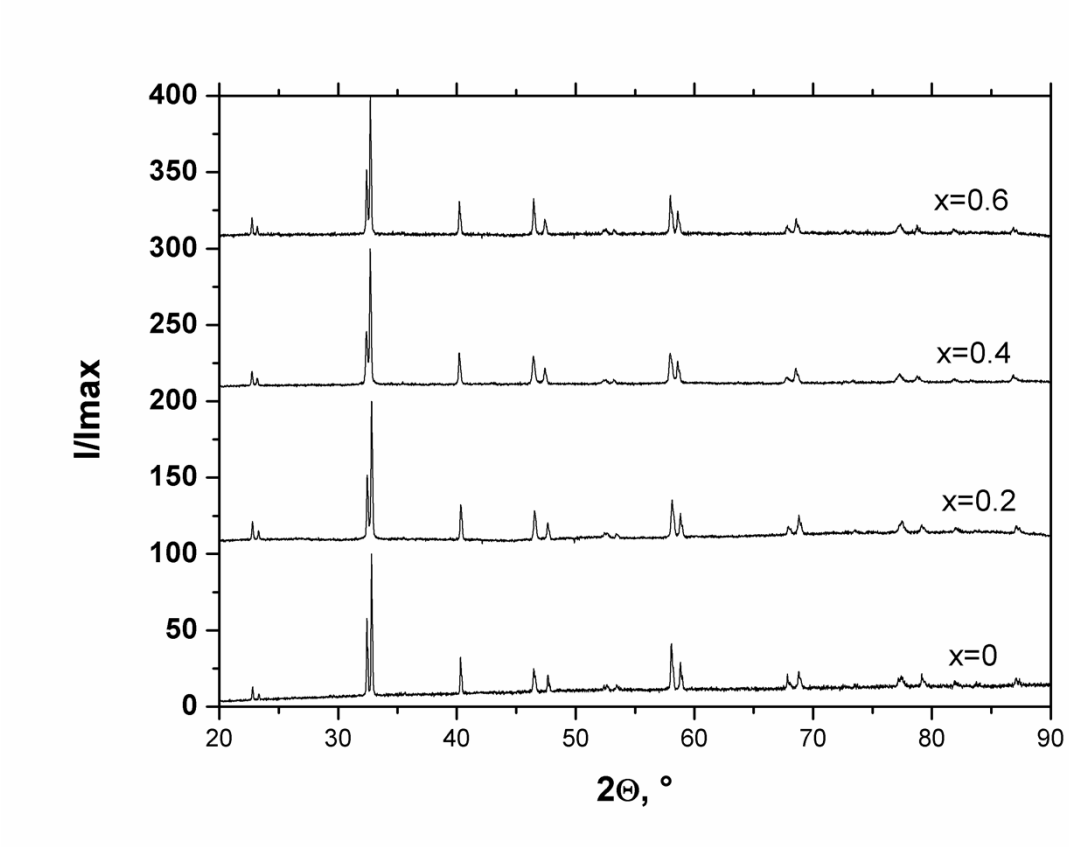

Fig. S1. XRD patterns of slowly (~100 °C/hour) cooled double perovskites of nominal compositions $PrBaCo_{2-x}Fe_xO_{6-\delta}$ (x = 0-0.6).

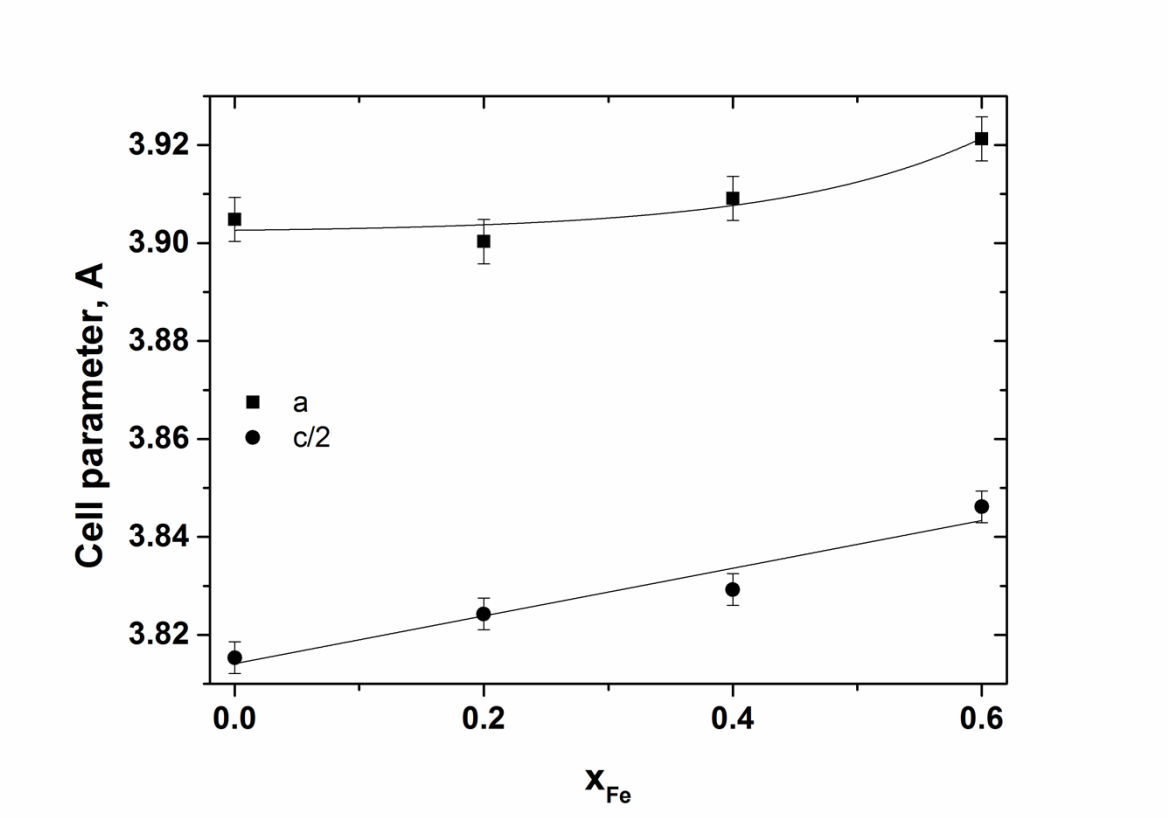

Fig. S2. Lattice parameters of $PrBaCo_{2-x}Fe_xO_{6-\delta}$ (x = 0-0.6) as a function of Fe content at room temperature. Lines are guide to eye only.

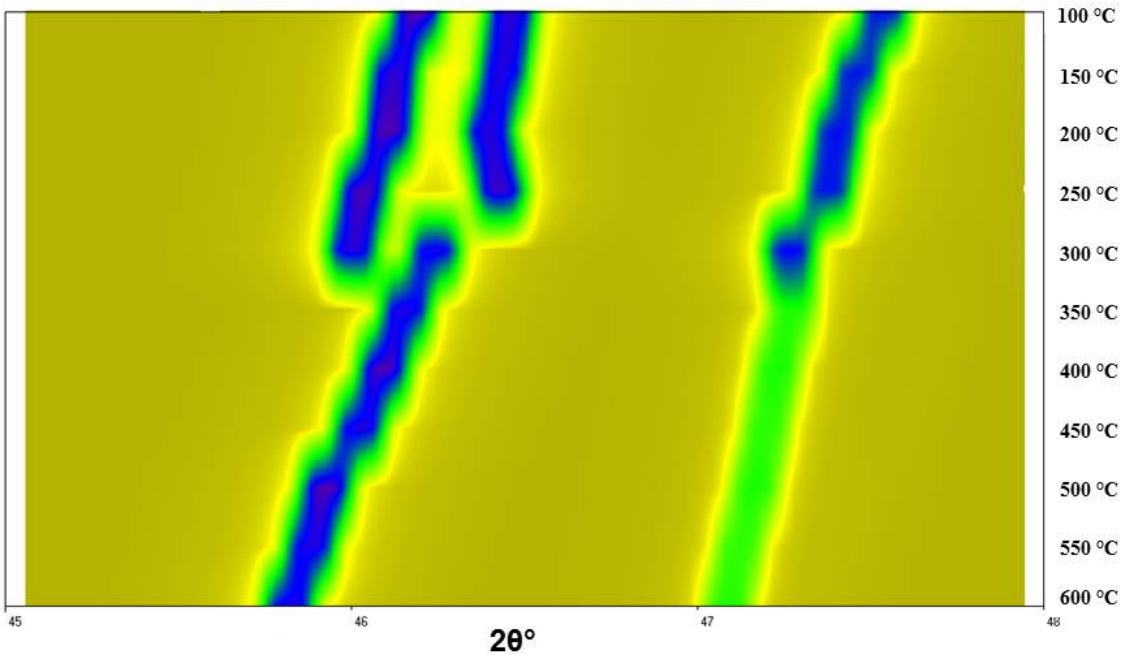

Fig. S3. Variable temperature XRD data in 2Θ range 45-48° for $PrBaCo_2O_{6-\delta}$ at pO_2=10^{-4} atm.

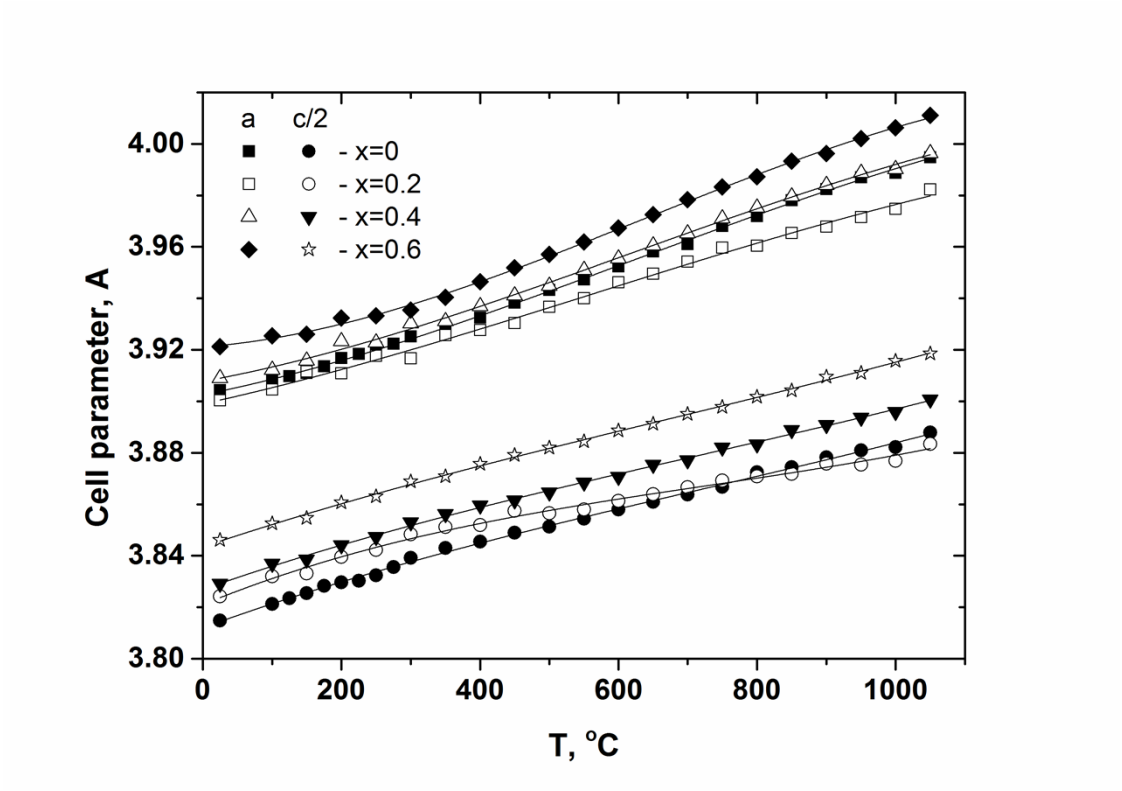

Fig. S4. Lattice parameters of $PrBaCo_{2-x}Fe_xO_{6-\delta}$ (x = 0-0.6) vs. temperature in air. Symbols are experimental data and lines are guide to eye.

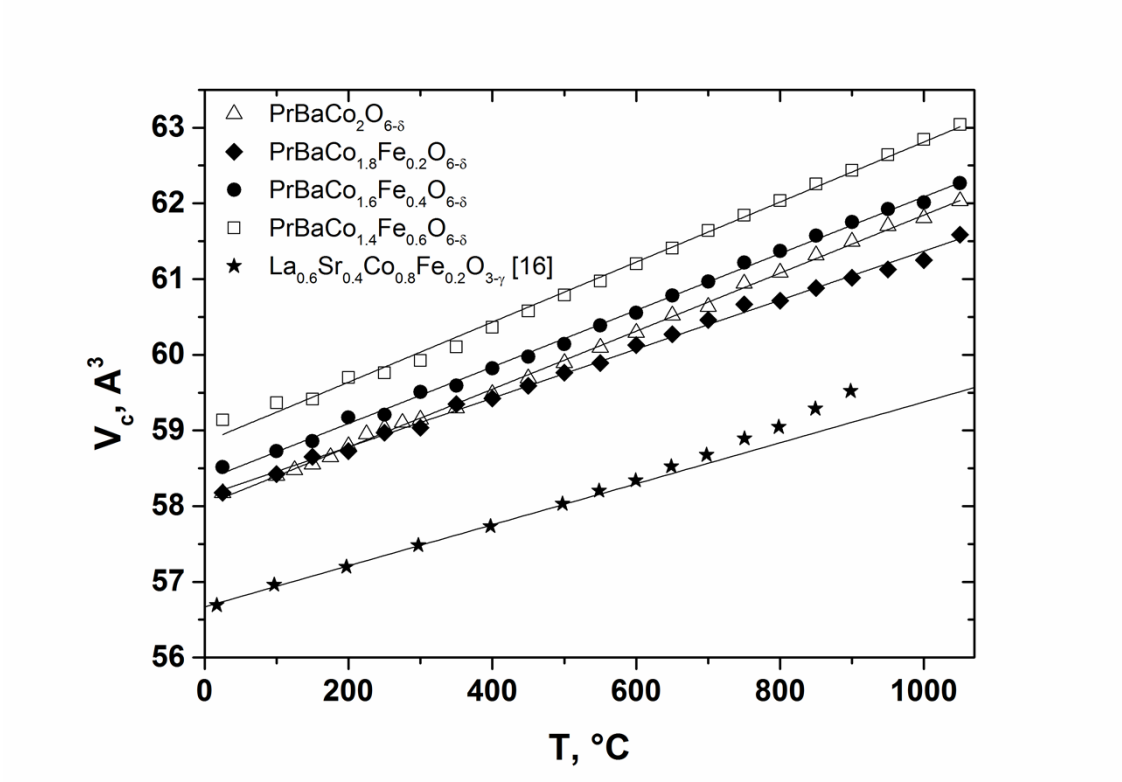

Fig. 5. Cell volumes of $PrBaCo_{2-x}Fe_xO_{6-\delta}$ (x = 0-0.6) and $La_{0.6}Sr_{0.4}Co_{0.8}Fe_{0.2}O_{3-\gamma}$[16] vs. temperature in air. Lines are linear fit results.