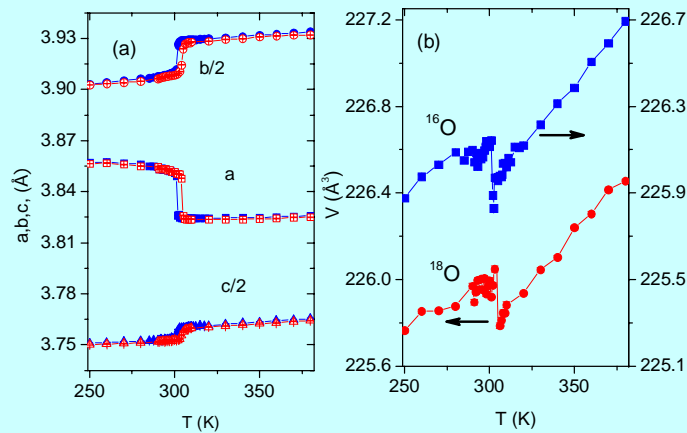
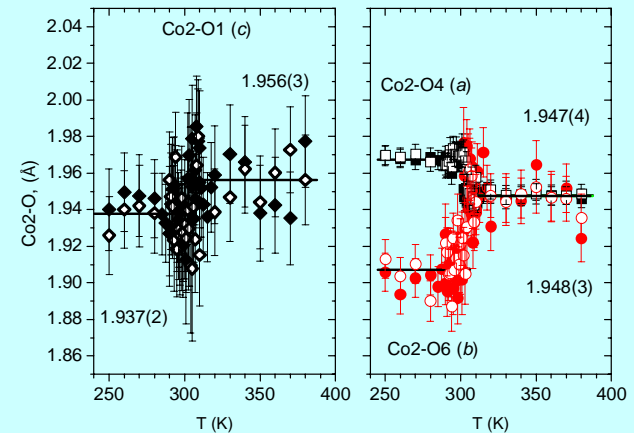


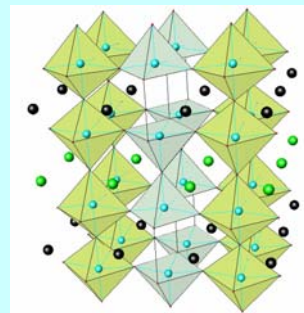
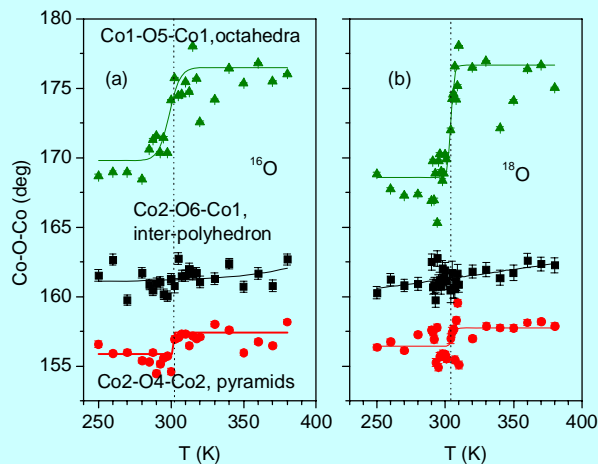
Orbital order-disorder transition with volume collapse in $\text{HoBaCo}_2\text{O}_{5.5}$



Crystal lattice constants (Pmmm space group) and unit cell volume for ^{16}O and ^{18}O substituted $\text{HoBaCo}_2\text{O}_{5.5}$ samples.



Temperature dependence of Co-O bond lengths in CoO_5 -pyramids



The insulator to metal transition in $\text{HoBaCo}_2\text{O}_{5.5}$ above $T_{\text{MI}}=305\text{K}$ occurs concomitantly with the melting of the orbital order in pyramids and increase of the Co-O-Co bond angle together with the unit cell volume collapse.

E.Pomjakushina, K. Conder, V. Pomjakushin. Orbital order-disorder transition with volume collapse in $\text{HoBaCo}_2\text{O}_{5.5}$: A high resolution neutron diffraction study. Phys. Rev. B, **73**, 113105 (2006).

Temperature dependences of the angles ϕ between octahedra Co1-O5-Co1 , pyramids Co2-O4-Co2 and inter-polyhedron Co2-O6-Co1 for ^{16}O and ^{18}O substituted samples.