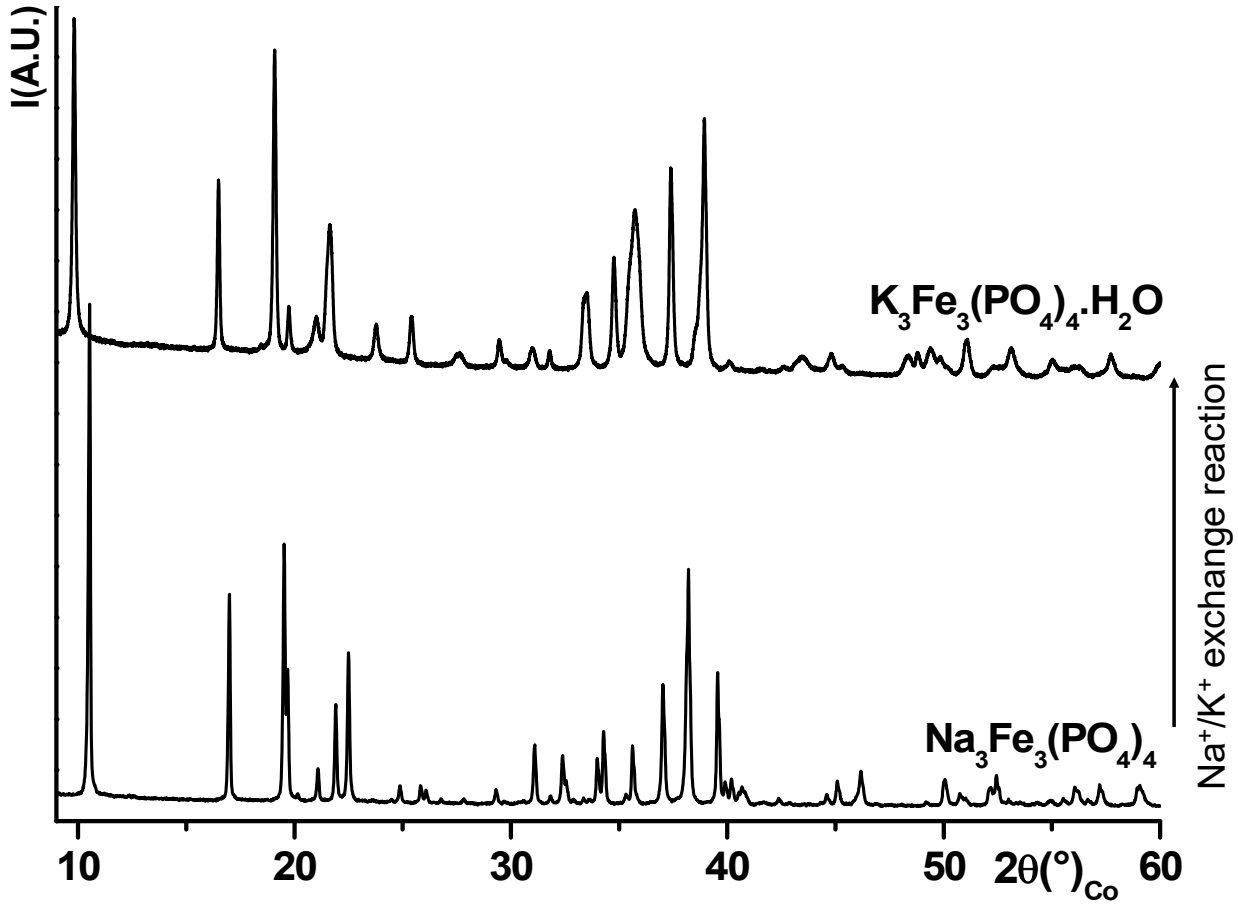


Figure 1: X-ray diffraction patterns of $Na_3Fe_3(PO_4)_4$ and $K_3Fe_3(PO_4)_4 \cdot H_2O$ after Na^+/K^+ ions exchange in aqueous solution.

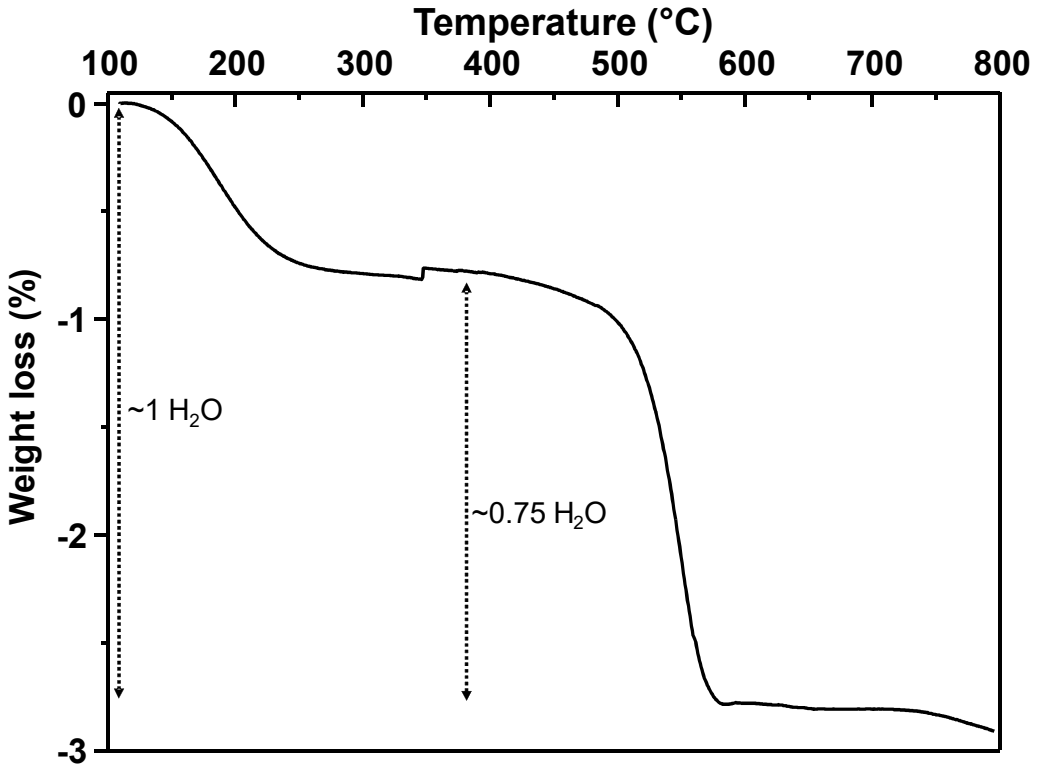


Figure 2: Thermogravimetric thermal analysis (TGA) of $K_3Fe_3(PO_4)_4 \cdot H_2O$ performed under argon flow at 5°C/min.

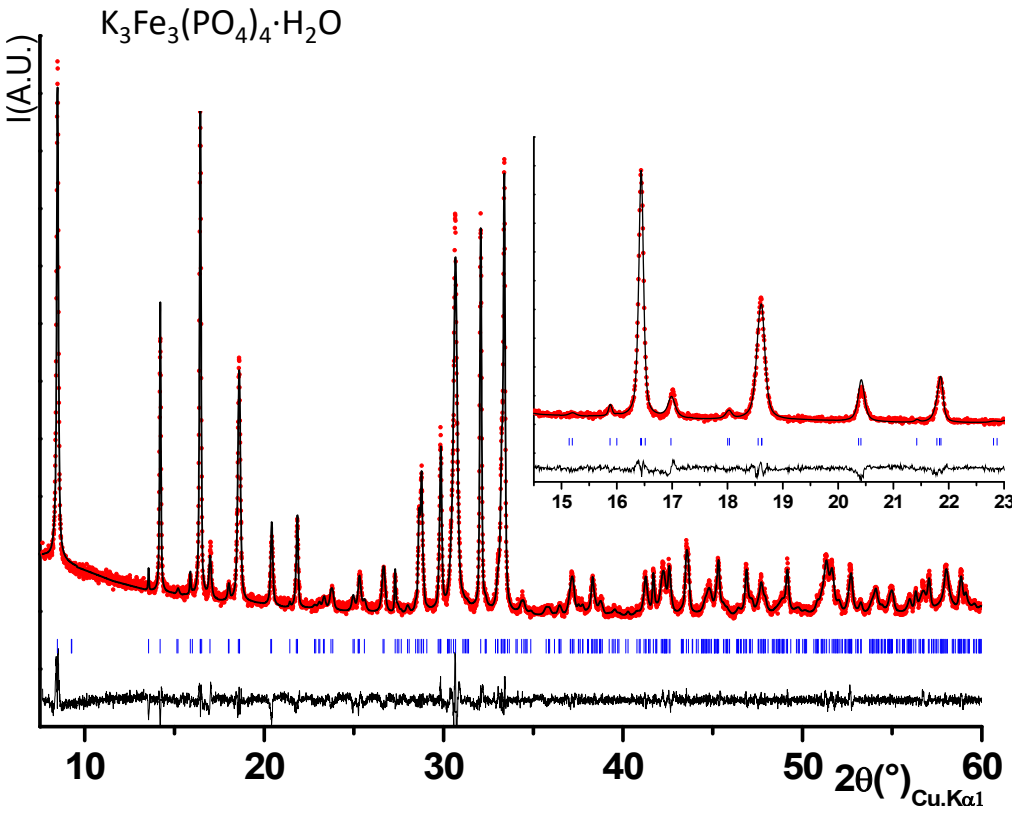
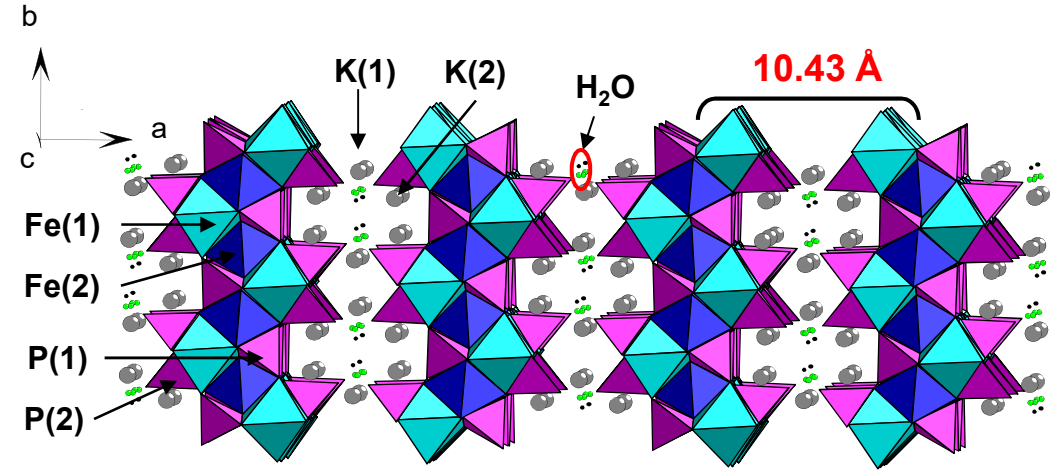


Figure 3: Comparison between the experimental (•) X-ray diffraction pattern of $K_3Fe_3(PO_4)_4.H_2O$ (*P2/n*) and the calculated (-) one using the Le Bail method. The difference plot (Iobs. – Icalc.) is also given, as well an enlargement of a selected angular range is given to evaluate the quality of the refinement.

a) $K_3Fe_3(PO_4)_4$. H_2O



b) $Na_3Fe_3(PO_4)_4$

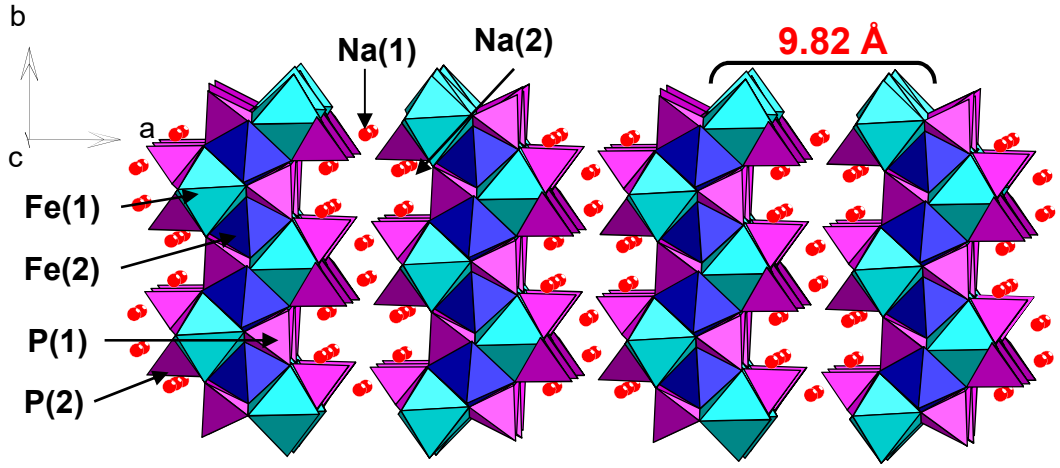


Figure 4: Representation of the structures of the $K_3Fe_3(PO_4)_4 \cdot H_2O$ (a) and $Na_3Fe_3(PO_4)_4$ (b) phases.

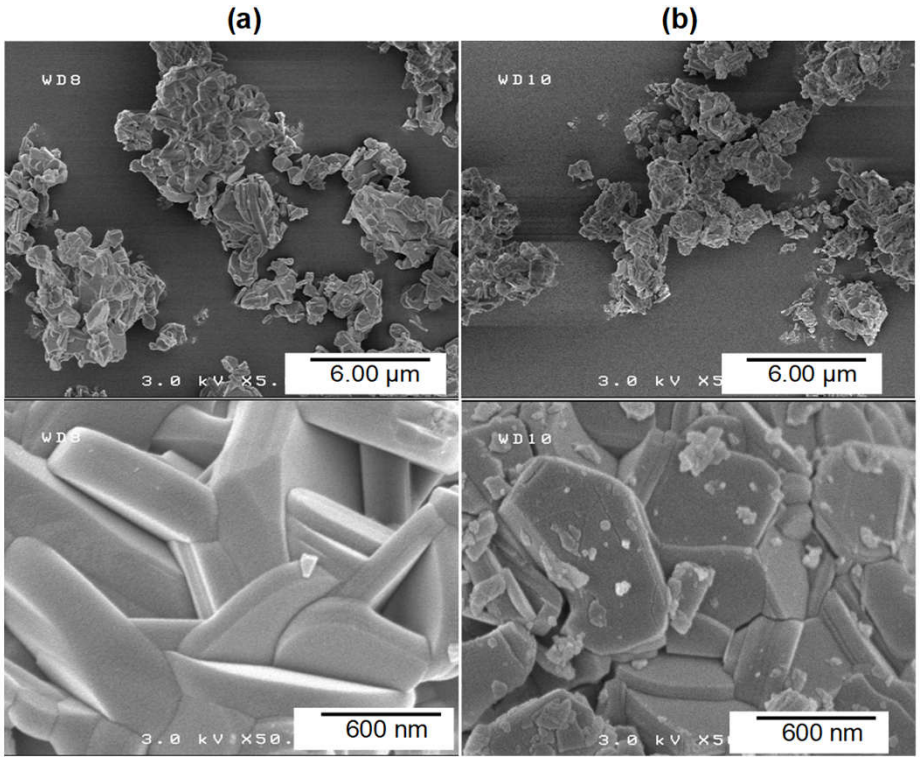


Figure 5: SEM micrographs of $K_3Fe_3(PO_4)_4 \cdot H_2O$ (a) and $Na_3Fe_3(PO_4)_4$ (b).

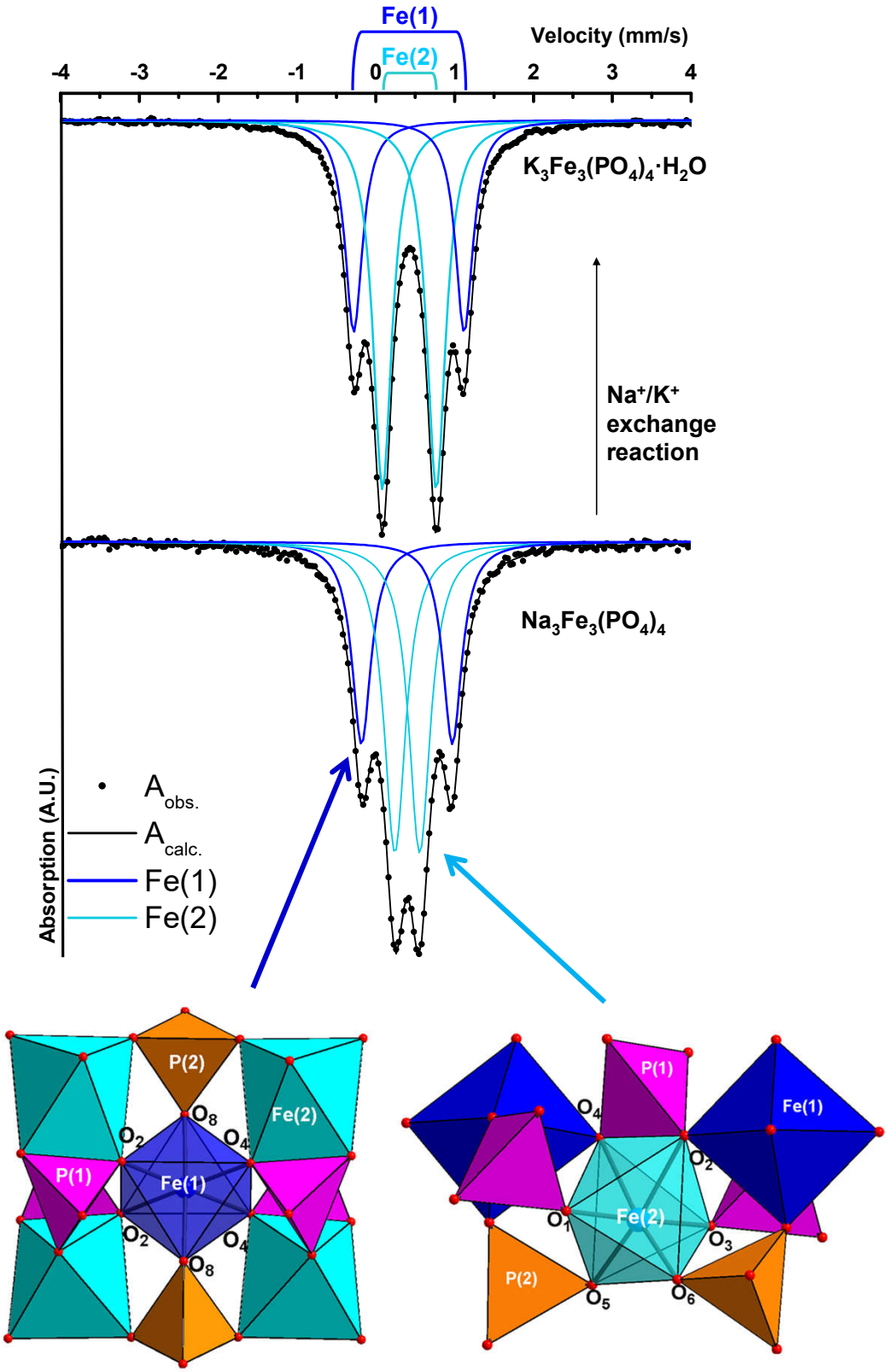


Figure 6: Experimental Mössbauer spectra of $K_3Fe_3(PO_4)_4$ and $Na_3Fe_3(PO_4)_4$ recorded at room temperature and calculated Lorenztian quadrupole doublets associated to Fe(1) and Fe(2).

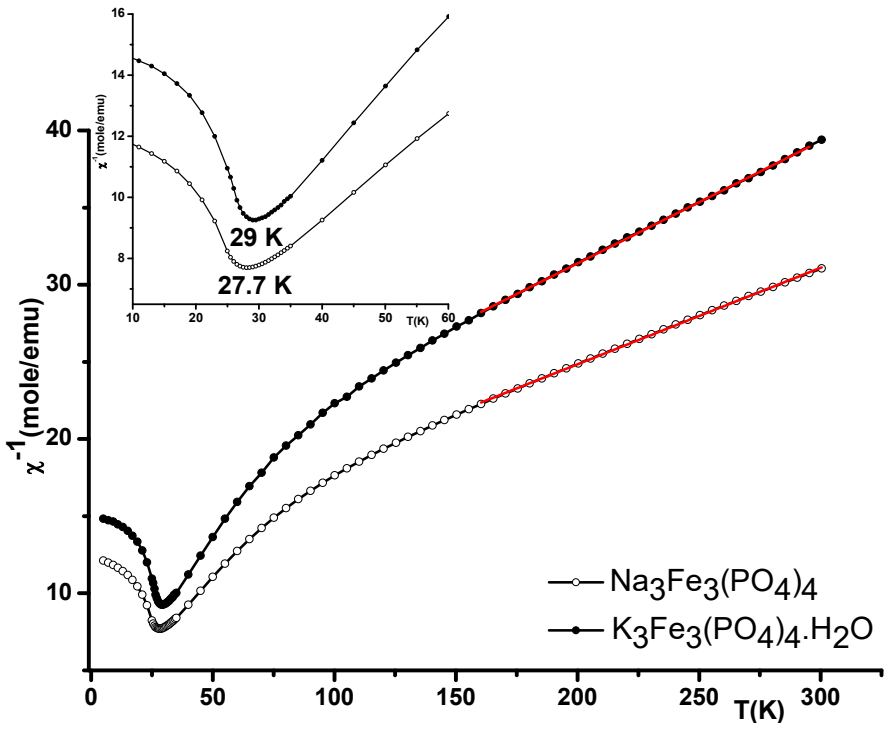


Figure 7: A plot of the reciprocal susceptibility versus temperature for $K_3Fe_3(PO_4)_4 \cdot H_2O$ and $Na_3Fe_3(PO_4)_4$ with an applied field 10 KOe.

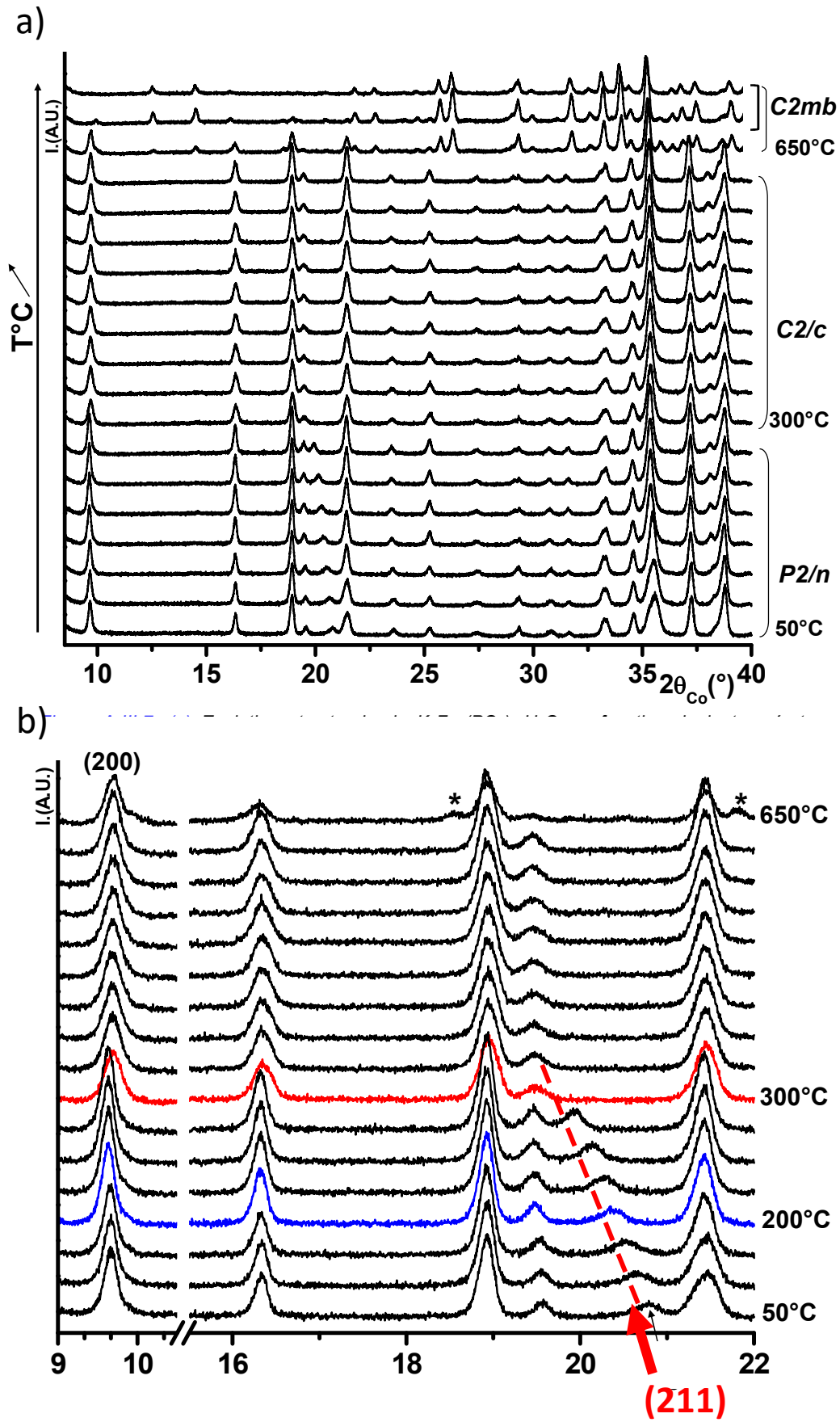


Figure 8: *In-situ* XRD patterns recorded while heating $K_3Fe_3(PO_4)_4{\cdot}H_2O$ from room temperature to 800°C. a) global view and (b) zoom on specific 2θ ranges and temperature domain.

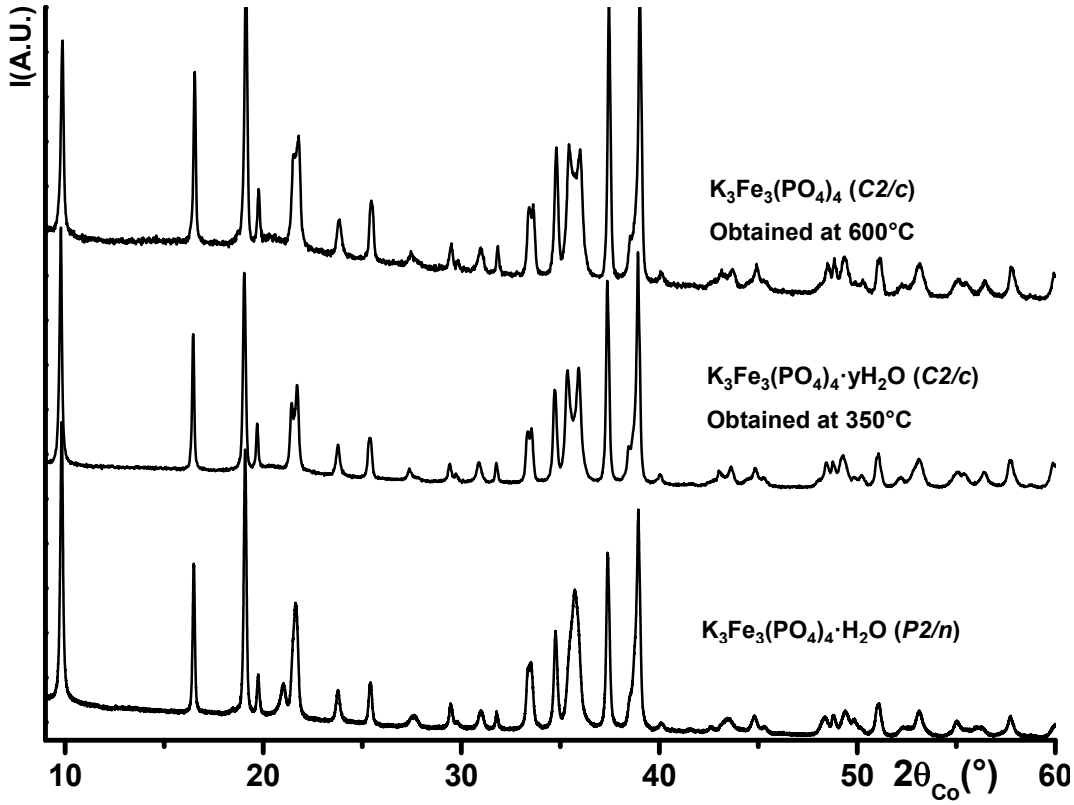


Figure 9: *Ex situ* room temperature XRD patterns of the compounds obtained from $K_3Fe_3(PO_4)_4 \cdot H_2O$ after heat treatment at 350°C and 600°C compared with the one of the parent phase $K_3Fe_3(PO_4)_4 \cdot H_2O$.

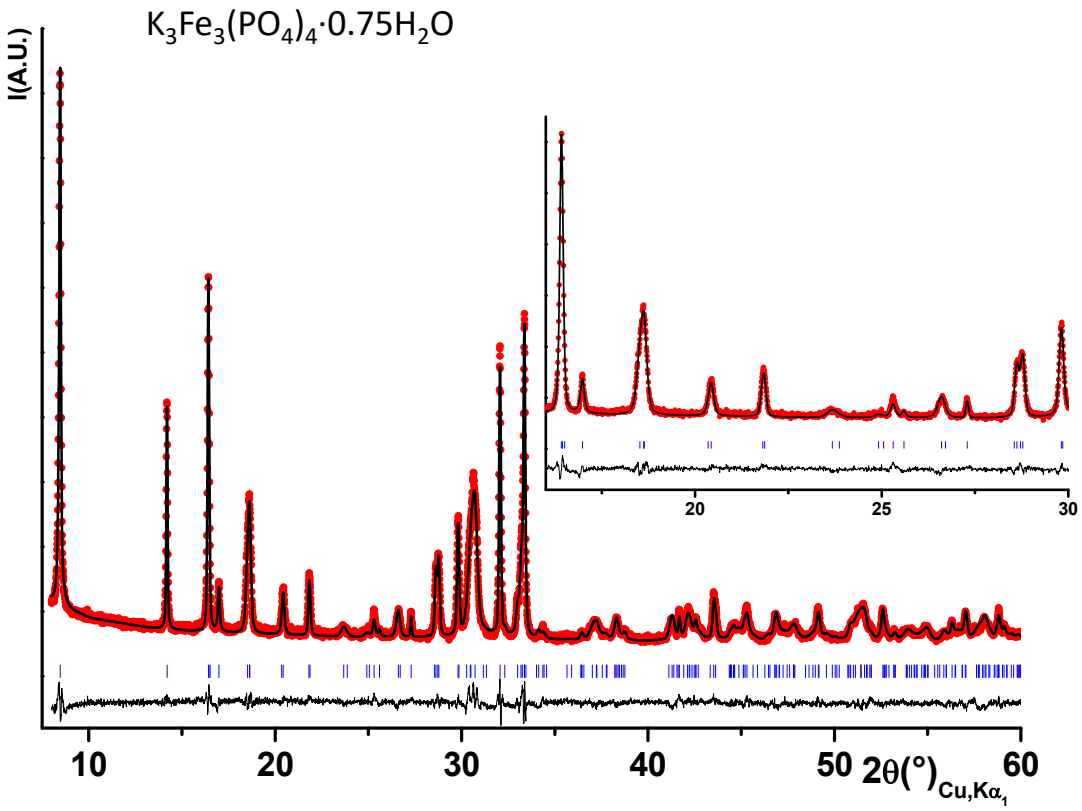


Figure 10: Comparison between the experimental (•) room temperature X-ray diffraction pattern of $K_3Fe_3(PO_4)_4.0.75H_2O$ (*C2/c*) obtained at 350°C and the calculated (-) one using the Rietveld method. The difference plot (Iobs. – Icalc.) is also given, as well An enlargement of a selected angular range is given to evaluate the quality of the refinement.

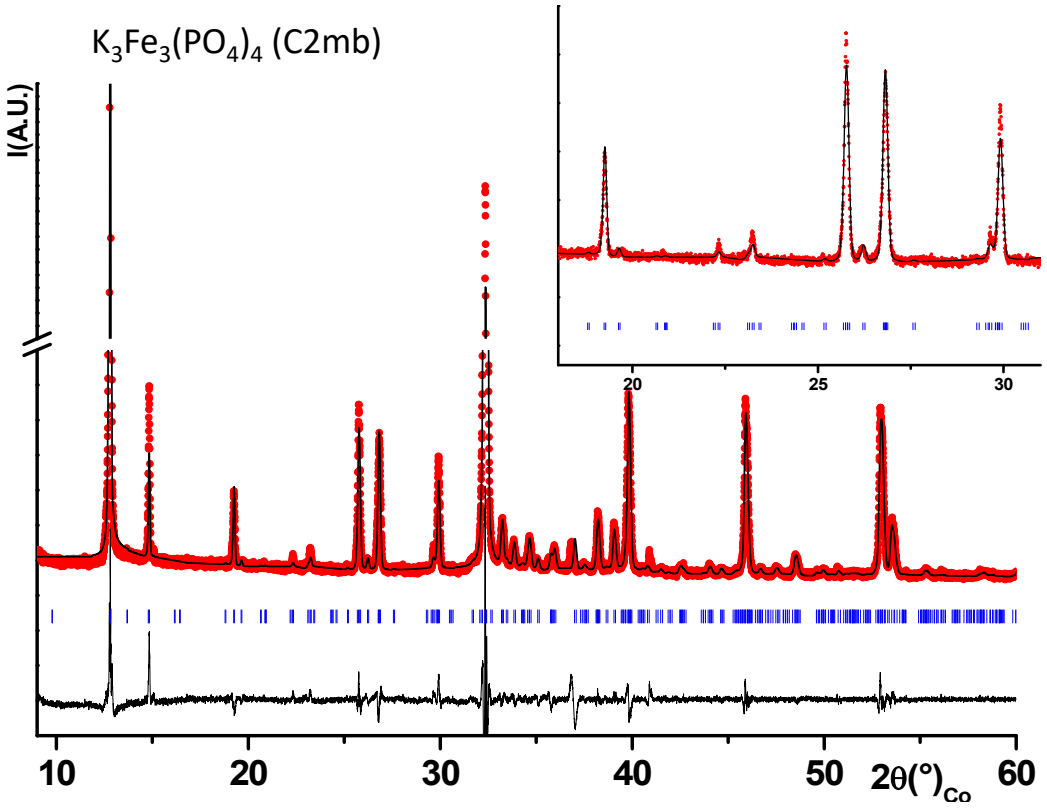


Figure 11: Comparison between the experimental (•) X-ray diffraction pattern of $K_3Fe_3(PO_4)_4$ (*C2mb*) obtained at 750°C and the calculated (-) one using the Rietveld method. The difference plot (Iobs. – Icalc.) is also given, as well An enlargement of a selected angular range is given to evaluate the quality of the refinement.