

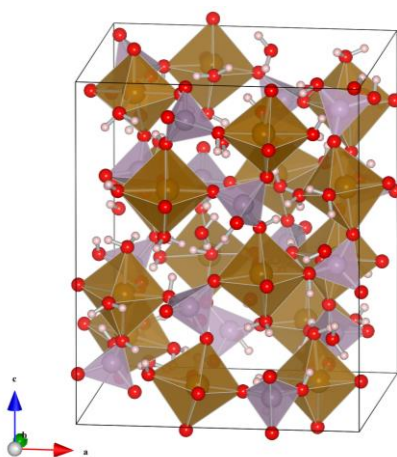
## Introduction

- Koninckite was discovered in Richelle (Belgium) by G. Cesàro in 1884, and studied by Van Tassel in 1968.
- Forms pale brownish spheroidal aggregates measuring less than 0.5 mm in diameter, and associated with Richellite.
- Crystal structure is difficult to solve from single-crystal X-ray diffraction due to the fibrous habit.
- Plášil *et al.* (2015) solved the structure of Koninckite from Kociha, Slovakia, by using synchrotron powder X-ray diffraction data.
- New investigation on Koninckite from the type locality, Richelle, allowed to find good quality isolated crystal, used to obtain single-crystal diffraction data.

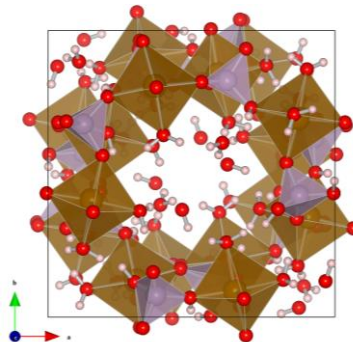
## Morphology



## Crystal structure



$a$ (Å)	11.9800(5)	11.9852(2)
$b$ (Å)	11.9800(5)	11.9852(2)
$c$ (Å)	14.6180(1)	14.6239(3)
$V$ (Å <sup>3</sup> )	2097.90(2)	2100.67(7)
S.G.	$P4_22_1$	$P4_22_1$
$Z$	8	16
	Plášil <i>et al.</i> (2015)	This study



Fe1-02	2.064(3)	Fe2-010	1.995
Fe1-04	2.019(3)	Fe2-011	2.113
Fe1-05	1.988(3)	P3-01	1.514
Fe1-0	1.981(3)	P3-0	1.552
Fe1-09	1.927(3)	P3-09	1.525
Fe1-012	2.087(4)	P3-010	1.548
Fe2-01	1.891(3)	P4-04	1.533
Fe2-03	2.075(3)	P4-05	1.540
Fe2-07	1.996(3)	P4-07	1.541
Fe2-08	1.946(3)	P4-08	1.543

## Structure of Koninckite

- Asymmetric unit contains 2 Fe, 2 P, 14 O and 12H atoms.
- Fe are coordinated by 4 O atoms and 2 water molecules, forming fairly regular octahedral sites connected to tetrahedral PO<sub>4</sub> sites by corner-sharing.
- Heteropolyhedral framework of alternating Fe(O,H<sub>2</sub>O)<sub>6</sub> octahedra and PO<sub>4</sub> tetrahedra.
- Channels parallel to the  $c$  axis, which contain water molecules.

## Conclusions

- The results are similar to Plášil *et al.* (2015).
- Accurate localization of hydrogen atoms.
- Due to the lower multiplicity of one H<sub>2</sub>O molecule, the chemical formula of the mineral is Fe(PO<sub>4</sub>).2.75H<sub>2</sub>O ( $Z = 16$ ).