

MS14-P35 | THE CRYSTAL STRUCTURES OF NATURAL BARYUM BERYLLOPHOSPHATES

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Three new Ba-bearing beryllorphosphates were recently described. Minjiangite, $\text{BaBe}_2\text{P}_2\text{O}_8$, occurs in the Nanping No. 31 pegmatite, China (space group $P6/mmm$, $a = 5.028(1)$, $b = 7.466(1)$ Å). It shows a phyllophosphate structure consisting of double layers of tetrahedra, which contain both Be and P in a 1:1 ratio. Inside the layers, $(\text{Be,P})\text{O}_4$ tetrahedra form six-membered rings by sharing corners. The Ba atoms are located in regular 12-coordinated polyhedra and connect two successive double layers. Wilancookite, $(\text{Ba,K,Na})_8(\text{Ba,Li,[]})_6\text{Be}_{24}\text{P}_{24}\text{O}_{96}\cdot 32\text{H}_2\text{O}$, occurs in the Lavra Ponte do Piauí pegmatite, Minas Gerais, Brazil. Its crystal structure ($I23$, $a = 13.5398(2)$ Å) is identical to those of pahasapaite and of synthetic zeolite RHO; the framework is based on corner-sharing BeO_4 and PO_4 tetrahedra forming a large cavity in which occur Ba atoms and water molecules. Three different types of rings are building the cavity: eight-, six-, and four-membered rings. A third new species was discovered in the Vilatte-Haute pegmatite, Limousin, France, with the ideal formula $\text{BaCa}[\text{Be}_4\text{P}_4\text{O}_{16}]\cdot 6\text{H}_2\text{O}$. This beryllorphosphate (space group $P2_1/c$, $a = 9.4958(4)$, $b = 13.6758(4)$, $c = 13.4696(4)$ Å, $\beta = 90.398(3)^\circ$) shows a zeolite framework identical to that of phillipsite, based on corner-sharing BeO_4 and PO_4 tetrahedra forming inter-connected 4-membered and 8-membered rings. Large cages within this zeolite framework contain Ba, Ca and water molecules.