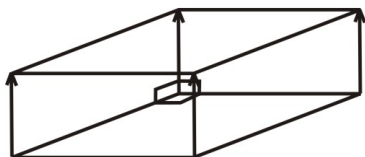
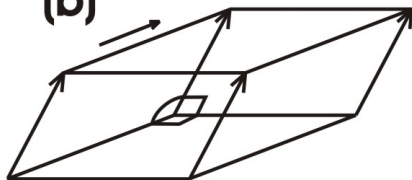


(a)



(b)



(c)

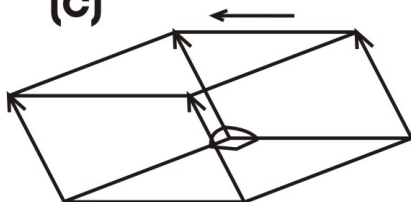


Figure 1. Formation of the biclinic parallelepiped. (a): orthorhombic parallelepiped, (b): monoclinic parallelepiped, (c): biclinic parallelepiped.

Keywords: crystal system, space group, formulae, kaolinite

MS15-P23 Crystal Structure of a New Coordination Polymer

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The oxalate dianion is one of the most studied ligands, capable of bridging two or more metal centres and creating inorganic polymers based on the assembly of metal polyhedra with a wide variety of one-, two - or three dimensional extended structures. Among the oxalate-based compounds M with the general formula $AM(C_2O_4)_n(H_2O)$ (A= alkali metal and , M= trivalent element), only a few crystal structures involving sodium metal have been reported in the literature with M=Yb [1]. As a continuation of work on mixed oxalate-based compounds with a tri- or bivalent element [2] a new coordination polymer, namely catena-poly[[diaquasodium(I)]- μ -oxalato- k^4 O1,O2:O1',O2'-[diaquairon(III)]- μ -oxalato- k^4 O1,O2:O1',O2'], $[NaFe(C_2O_4)_2(H_2O)_4]_n$, has been prepared and its crystal structure elucidated by single-crystal X-Ray diffraction analysis [3]. The compound crystallizes in the non centrosymmetrical space group $I4_1$ ($Z = 4$). The asymmetric unit contains one Na(I) atom and one Fe(III) atom lying on a fourfold symmetry axis, one oxalate ligand and two aqua ligands. Each metal atom is surrounded by two chelating oxalate ligands and two equivalent water molecules, in a *cis* arrangement. The structure consists of infinite one-dimensional chains of alternating $FeO(H_2OW)_2$ and $NaO(H_2OW)_2$ octahedra, bridged by oxalate ligands, parallel to the [100] and [010] directions, respectively (Fig. 1). Because of the *cis* configuration and the μ_2 -coordination mode of the oxalate ligands, the chains run in a zigzag manner. This arrangement facilitates the formation of hydrogen bonds between neighboring chains involving the H_2O and oxalate ligands, leading to a two-dimensional framework. The resulting framework exhibits tunnels parallel to the *c* axis with an elliptic cross-section as shown in Fig. 1. The structure of this new one dimensional coordination polymer is shown to be unique among the $A^I M^{III}(C_2O_4)_2(H_2O)_n$ series. The thermal decomposition behavior has been studied by TG and DTA and gave as a final product the well-known ternary oxide $NaFeO_2$ [1] Chapelet-Arab B., Duvieubourg, L., Nowogrocki G., Abraham F., Grandjean S. (2006). *J. Solid State Chem.* **179**, 4029 [2] Kherfi H., Hamadène M., Guehria A., Dahaoui S. & Lecomte C. (2011). *Acta Cryst.* **C67**, m85 (2013). *Acta Cryst.* **E69**, m493 [3] Benhacine M.A., Hamadène M., Bouacida S., Mérazig H. (2016). *Acta Cryst.* **C72**, 243

Keywords: absolute structure, one-dimensional chains, new structural type