TABLE 1

	Ligand	Halogen	Crystal Data
1	$(Me_2CHCH_2)_2SO$	Cl	a=10.10, b=10.43, c=13.29Å; β=106.36°; Z=2; $P=2_1/c$
2	$(MePhN)_2CO$	Cl	a=14.01, b=19.33, c=14.44Å; β=119.28°; Z=4; $P2_1/n$
3*	$(MePhN)_2CO$	Cl	a=15.87, b=13.21, c=15.76Å; Z=4; $Pna2_1$
4	$(MePhN)_2CO$	Br	a=14.39, b=19.85, c=24.71Å; Z=8; Fddd
5**	$(C_4H_8N)_3PO$	Cl	a=17.03, b=11.71, c=18.21Å; β=109.2°; Z=4; C2/c
6	Ph_3AsO	Br	a=10.24, b=15.79, c=12.19Å; β=100.94°; Z=2; $p2_1$

*polymorph of 2

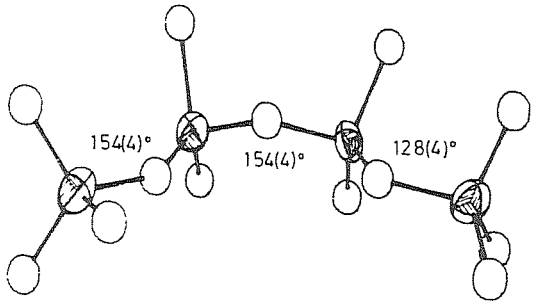
**pyrrolidyl

08.2–28 THE CRYSTAL STRUCTURE OF α-EUCRYPTITE, $LiAlSiO_4$. By K.-F. Hesse, Mineralogisches Institut, Universität Kiel, D-2300 Kiel, Germany.

According to Winkler (Acta Cryst. (1953)6, 99) the low temperature polymorph of $LiAlSiO_4$, α-eucryptite, is isostructural with phenakite, Be_2SiO_4, and willemite, Zn_2SiO_4, and has an ordered Al,Si distribution. However, no structure determination has been published. Natural and synthetic crystals of α-eucryptite have now been used for structure refinement. Crystallographic data: trigonal $R\bar{3}$, a_{hex} = 13.473(3)Å, c_{hex} = 9.001(2)Å, Z = 18. With 1895 (1467) non-equivalent reflections the refinement converged at residuals of R = 0.080 (0.054) and R_w = 0.040 (0.042) for the natural (synthetic) crystal. The results of these structure determinations are: the structures consist of $[(Al,Si)O_4]$ tetrahedra with (Al,Si)-O mean distance 1.689Å (1.688Å) and $[Li\text{-}O_4]$ tetrahedra with Li-O mean distance 1.981Å (1.984Å). The (Al,Si)-O distances suggest statistical Al,Si distribution or microtwinning in both natural and synthetic α-eucryptite. The Giebe-Scheibe test, high-resolution electron microscopy and diffraction strongly favour statistical Al,Si distribution.

08.2–29 $Pb_8[O_2(SO_4)(Si_4O_{13})]$, A NEW TETRASILICATE. By R. Fröhlich, Institut für Kristallographie, Universität, D-7500 Karlsruhe, Germany

In the system $PbO\text{-}PbSO_4\text{-}PbSiO_3$ several ternary phases exist; the compound $8PbO\cdot SO_3\cdot 4SiO_2$ melts congruently at 785°C and shows no phase transitions (Billhardt, thesis, Karlsruhe, 1968). Single crystals can be prepared by slow cooling from 800°C to 600°C and subsequent annealing at 600°C. Crystal data: monoclinic space group $P2_1/n$; a=914.0(3), b=1955.4(6), c=1131.3(4) pm, β=89.68(3)°; Z=4. The structure was solved by Patterson and Fourier methods. The present value of R=0.115 for 2456 observed reflections is poor due to a preliminary absorption correction for the irregular shape of the crystal investigated. Further refinement is in progress. The basic building blocks of the structure are two tetrahedral $[Pb_4O]^{6+}$-units, a sulphate group, and the tetrasilicate anion shown below.



$[Si_4O_{13}]^{10-}$-ion; Si drawn as thermal ellipsoids.

08.2–30 THE CRYSTAL STRUCTURE OF $Zn_2Ti_{18}S_{32}$

By I. Kawada, M. Onoda and M. Saeki, National Institute for Research in Inorganic Materials, Sakura-mura, Ibaraki-ken 305, Japan.

Expecting tetrahedral coordination of metal-sulfur in M-Ti-S system (M=metal), we have synthesized a new phase of $Zn_2Ti_{18}S_{32}$. (M. Saeki and M. Onoda, Chem. Lett. 1329, 1982).

Obtained specimen was in powder form of dark gray color. 69 independent powder diffraction data were collected by an X-ray powder diffractometer using Cu- and Mo-target. Crystal system is cubic; a=9.843 Å. Taking no account of 2 very diffuse reflections, space group is $Fd3m - O_h^7$.

Crystal structure was solved by crystal chemical considerations. The structure consists fundamentally of cubic closest packing of sulfur atoms. 16 Ti atoms occupy octahedral sites (Ti (1)) and 2 Ti atoms occupy statistically another 16 octahedral sites (Ti(2)). 2 Zn atoms occupy statistically 8 tetrahedral sites which are surrounded only by Ti(2) and S. (Table 1.). Considering very short distance between Zn and Ti(2) (2.13 Å), it is probable that Zn and Ti(2) do not simultaneously coexist at the nearest positions. If one takes account of the existence of diffuse reflections (e.g. 200 etc.), more detailed feature of the structure will be clarified.

Table 1.

		m	x	y	z	B
Zn	8(a)	1/4	1/8	1/8	1/8	2.39
Ti(1)	16(d)	1	1/2	1/2	1/2	1.35
Ti(2)	16(c)	1/8	0	0	0	0.02
S	32(e)	1	0.2504	0.2504	0.2504	0.92

number of reflections: 67, R=0.0695.