site occupancies was attempted. However, this influenced neither the displacement parameters nor the R values. In an attempt to resolve the sixfold disorder, the structure was recalculated based on a triplet of a monoclinic unit cell (a = 9.814, b = 7.634, c = 12.445 Å,  $\beta = 108.14^{\circ}$ , Z = 2) in space group I2/m (t subgroup of  $R\bar{3}m$ ). The transformation matrix is  $-\frac{1}{3}, \frac{1}{3}, \frac{1}{3}, \frac{1}{3}/1, 1, 0/-\frac{1}{6}, \frac{1}{6}, -\frac{1}{3}$  and the matrix of threefold rotation (twinning element) is 0,1,0/-1,-1,0/0,0,1. However, the refinement did not stabilize and one Cl ion of the YbCl<sub>6</sub> octahedron showed strongly anisotropic displacement parameters. A further attempt involved refinement as an inversion twin in the space group Im. Anisotropic refinement gave R1 = 0.036 for 1274 reflections with  $I < 2\sigma(I)$  and wR2(all data) = 0.092. The ratio of the triplets was 34(21 + 1)13:32(30 + 2):34(5 + 29), with the ratios of inversion twins in parentheses. However, the displacement parameters became even more anisotropic and the YbCl<sub>6</sub> octahedron showed an elongation that we could not rationalize. Furthermore, the Rvalues are no better than in the rhombohedral model. We therefore believe that disorder rather than twinning gives a correct model of the structure.

Data collection: CAD-4 EXPRESS (Enraf-Nonius, 1994). Cell refinement: CAD-4 EXPRESS. Data reduction: PROCESS, PSISCAN and PSICALC in MolEN (Fair, 1990). Program(s) used to solve structure: SHELXS86 (Sheldrick, 1990). Program(s) used to refine structure: SHELXL93 (Sheldrick, 1993). Molecular graphics: ZORTEP (Zsolnai, 1994), SCHAKAL92 (Keller, 1993). Software used to prepare material for publication: SHELXL93.

We thank Professor H.-J. Seifert for support and dedicate this paper to him on the occasion of his last 'first fine day'.

Lists of structure factors, anisotropic displacement parameters and complete geometry have been deposited with the IUCr (Reference: JZ1121). Copies may be obtained through The Managing Editor, International Union of Crystallography, 5 Abbey Square, Chester CH1 2HU, England.

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## Sr<sub>4</sub>Ga<sub>3</sub>Mo<sub>26</sub>O<sub>48</sub> Containing Mo<sub>7</sub> Clusters and Infinite Mo<sub>7</sub>-Mo<sub>10</sub>-Mo<sub>7</sub> Chains

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#### Abstract

The crystal structure of the strontium gallium molybdate Sr<sub>4</sub>Ga<sub>3</sub>Mo<sub>26</sub>O<sub>48</sub> is characterized by quasi-isolated monocapped octahedral Mo7 clusters and infinite Mo chains arranged in layers parallel to the ac plane of the monoclinic unit cell. The repeat unit of the chains is the tricluster Mo<sub>24</sub> chain fragment consisting of one Mo<sub>10</sub> and two Mo<sub>7</sub> clusters. The Mo-Mo distances range between 2.584(1) and 2.786(1) Å in the Mo<sub>7</sub> clusters and between 2.5963 (9) and 2.938 (1) Å in the chains. The shortest Mo-Mo distance between Mo<sub>7</sub> clusters is 3.1575(9) Å and between Mo<sub>7</sub> clusters and the chains is 3.171 (1) Å, which excludes any direct Mo-Mo interactions. The Mo-O distances range from 1.922(6) to 2.163 (6) Å, as usually observed in reduced Mo oxides. The four crystallographically independent Sr<sup>2+</sup> ions have coordination numbers of 11 or 12 with an environment in each case based upon a distorted cuboctahedron. The Sr—O distances range from 2.495(6) to 3.105(5)Å. The Ga<sup>3+</sup> ions are approximately tetrahedrally or octahedrally coordinated by O atoms. The Ga-O distances vary between 1.902 (6) and 2.059 (6) Å for the octahedral sites, and between 1.830(5) and 1.873(6) Å for the tetrahedral site.

### Comment

Over the last two decades, numerous reduced molybdenum oxides have been synthesized by solid-state reaction and fused-salt electrolysis. Most of these compounds contain clusters, sheets or infinite chains of Mo atoms with strong metal-metal bonds. Until now, only sheets based on Mo3 triangles were known, while infinite chains can be based on digonal Mo<sub>2</sub> groups, Mo<sub>4</sub> rhomboids or on octahedral Mo<sub>6</sub> clusters. Although the latter cluster has only been obtained in the unique compound Ca<sub>16.5</sub>Mo<sub>13.5</sub>O<sub>40</sub> (Lindblom & Strandberg, 1989) so far, it also constitutes the basic building block of larger clusters such as  $Mo_{4n+2}$  (n = 2, 3, 4 and 5) (Hibble, Cheetham, Bogle, Wakerley & Cox, 1988; Mattausch, Simon & Peters, 1986; Dronskowski & Simon, 1989; Schimek & McCarley, 1994) by sharing its trans edges. The final stage of this process of condensation of Mo<sub>6</sub> clusters via trans edges is the infinite chain  $|Mo_{4/2}Mo_2|_{\infty}$  which occurs, for example, in the  $M_r$ Mo<sub>4</sub>O<sub>6</sub> series (M = Na, K, Rb, Sr, Ba, Sn, Pb, In) (Torardi & McCarley, 1979, 1981; McCarley, 1986). Recently, two novel clusters, namely the Mo<sub>8</sub> cluster and the tricluster Mo<sub>24</sub> chain fragment, were obtained in the two series of compounds  $RMo_8O_{14}$  (R = La, Ce, Pr, Nd and Sm) (Leligny, Ledesert, Labbe, Raveau & McCarroll, 1990; Leligny et al., 1993; Gougeon & McCarley, 1991; Kerihuel & Gougeon, 1995a,b) and  $R_5Mo_{32}O_{54}$ (R = La, Ce, Pr and Nd) (Gall, Toupet & Gougeon, 1993), respectively. The former cluster is based on an octahedral Mo<sub>6</sub> cluster, two faces of which are capped by two additional Mo atoms. This cluster, which exists in the RM08O14 family in two different forms (cis and trans configuration) of the three possible isomers, is, to our knowledge, the first example of geometrical isomerism observed in reduced molybdenum compounds in solid-state chemistry. The Mo core of the remarkably chain-like Mo<sub>24</sub>O<sub>60</sub> cluster unit observed in the second series consists of one bioctahedral Mo<sub>10</sub> and two monocapped Mo<sub>7</sub> clusters strongly linked through a Mo-Mo bond of 2.77 Å. We present here the crystal structure of Sr<sub>4</sub>Ga<sub>3</sub>Mo<sub>26</sub>O<sub>48</sub>, where the tricluster Mo<sub>7</sub>-Mo<sub>10</sub>-Mo<sub>7</sub> chain fragments form infinite complex chains which coexist with quasi-isolated monocapped octahedral Mo<sub>7</sub> clusters.

Fig. 1, which represents the projection of the Mo network for Sr<sub>4</sub>Ga<sub>3</sub>Mo<sub>26</sub>O<sub>48</sub> on the ac plane, clearly shows that the main metallic building blocks of this structure are monocapped octahedral Mo<sub>7</sub> clusters and infinite Mo chains, which are both arranged in layers parallel to the *ac* plane. The repeat unit of the chains, which run parallel to the a axis, is the tricluster Mo<sub>24</sub> chain fragment shown in Fig. 2 with its oxygen environment. This fragment, which consists of one Mo<sub>10</sub> and two Mo7 clusters strongly linked through an Mo-Mo bond, differs slightly from the one previously observed in La<sub>5</sub>Mo<sub>32</sub>O<sub>54</sub>, where the capped face is the one defined by Mo(16), Mo(18) and Mo(20) in Fig. 2. The construction of the chain in Sr<sub>4</sub>Ga<sub>3</sub>Mo<sub>26</sub>O<sub>48</sub> arises from the sharing of  $O^i \cdots O^i$  edges accompanied by  $O^{a-i}$  bonds, as shown in Fig. 2. This new type of connection results in an Mo(18)-Mo(18) distance of 2.780(1) Å between the Mo<sub>7</sub> clusters of the tricluster chain fragments. In La<sub>5</sub>Mo<sub>32</sub>O<sub>54</sub>, they are separated from each other by 3.1468 (9) Å. Within the Mo<sub>7</sub> clusters of the  $Mo_{24}$  chain fragment, the Mo-Mo distances lie between 2.616(1) and 2.938(1) Å, in contrast to 2.5561(9)-2.7925(9) in La<sub>5</sub>Mo<sub>32</sub>O<sub>54</sub>. The average Mo-Mo distance is 2.742 Å as opposed to 2.710 Å in La<sub>5</sub>Mo<sub>32</sub>O<sub>54</sub>. This larger value probably results from a diminuation of the number of electrons on the Mo<sub>7</sub> cluster due to an electron transfer towards the Mo(18)-Mo(18), Mo(18)-Mo(20) and Mo(16)-Mo(18) intercluster bonds between the Mo<sub>7</sub> clusters of the Mo<sub>24</sub> chain fragments. The Mo-O bond distances vary from 1.984(6) to

2.156 (6) Å with an average distance of 2.070 Å. For the Mo<sub>10</sub> cluster, which consists of two distorted Mo<sub>6</sub> octahedra sharing an edge, the Mo-Mo distances range between 2.5963 (9) and 2.8478 (9) Å. The average Mo-Mo distance of 2.744 Å is similar to that calculated for the  $MMo_5O_8$  compounds containing divalent cations where the  $Mo_{10}$  clusters form infinite chains [2.736 Å in CaMo<sub>5</sub>O<sub>8</sub> (Gougeon, 1993), 2.742 Å in SrMo<sub>5</sub>O<sub>8</sub> (Gall & Gougeon, 1994), 2.740 Å in  $EuMo_5O_8$  (Gall, 1993), 2.746 Å in SnMo<sub>5</sub>O<sub>8</sub> (Gougeon, Potel & Sergent, 1990) and 2.745 Å in PbMo<sub>5</sub>O<sub>8</sub> (Dronskowski & Simon, 1989; Dronskowski, Simon & Mertin, 1991)]. The Mo-O distances spread over a wide range [1.930(6)-2.157 (6) Å] with an average value of 2.063 Å, which also corresponds to that found in the MMo<sub>5</sub>O<sub>8</sub> compounds where  $M = Ca^{2+}$  (2.064 Å),  $Sr^{2+}$  (2.064 Å),  $Eu^{2+}$  (2.063 Å),  $Sn^{2+}$  (2.064 Å) and  $Pb^{2+}$  (2.061 Å). In the  $R^{3+}Mo_5O_8$  compounds, the average values range from 2.074 to 2.078 Å. The shortest intercluster distance between the Mo<sub>7</sub> and the Mo<sub>10</sub> cluster is 2.7816(9) Å [Mo(21)-Mo(22)], slightly longer than the value of 2.7688 (9) Å in La<sub>5</sub>Mo<sub>32</sub>O<sub>54</sub>. The other four intercluster distances range between 2.982(1) [Mo(20)---Mo(22)] and 3.059 (1) Å [Mo(21)-Mo(23)], while in  $La_5Mo_{32}O_{54}$  they range from 2.9916 (9) to 3.0637 (9) Å.

The second novel feature of the title compound is the presence of monocapped octahedral Mo<sub>7</sub> clusters (Fig. 3). Indeed, although  $M_7$  clusters are known in metal-organic compounds with M = Ru, Re, Os and Ir, for example, it is the first time that such clusters have been encountered in an inorganic compound. The

Fig. 1. Projection of Sr<sub>4</sub>Ga<sub>3</sub>Mo<sub>26</sub>O<sub>48</sub> on the *ac* plane showing only the molybdenum network. Displacement ellipsoids are drawn at the 95% probability level.

Mo—Mo distances within the two crystallographically independent monocapped Mo<sub>7</sub> clusters lie between 2.584 (1) and 2.7798 (9) Å for the cluster formed by the Mo atoms numbered from 1 to 7 (cluster I) and between 2.610 (1) and 2.786 (1) Å for the cluster formed by the Mo atoms numbered from 8 to 14 (cluster II). The average Mo—Mo distances for these two clusters are 2.707 and 2.716 Å, respectively. The Mo—O bond distances are in the ranges 1.922 (6)–2.163 (6) Å and 1.925 (6)–2.157 (6) Å with average values of 2.045 and 2.043 Å, respectively. The shortest Mo—Mo distance between the quasi-isolated Mo<sub>7</sub> clusters is 3.1575 (9) Å [Mo(1)—Mo(11)] and between the Mo<sub>7</sub> clusters and the chains is 3.171 (1) Å [Mo(8)—Mo(25)], which excludes any direct Mo—Mo interactions.

Of the four crystallographically independent  $Sr^{2+}$  ions (which are all in general positions), Sr(1), Sr(2) and Sr(3) are surrounded by twelve O atoms forming a distorted cuboctahedron. The Sr—O distances range







Fig. 3. The numbering scheme in the monocapped octahedral  $Mo_7O_{21}$  cluster units. The first numbers correspond to cluster I and the second to cluster II (see text).

from 2.513(6) to 3.000(6) Å for the Sr(1) site, from 2.495 (6) to 3.008 (6) Å for the Sr(2) site and from 2.640(6) to 3.105(5) Å for the Sr(3) site. The Sr(4) ions occupy twinned cavities formed by two fused cuboctahedra and are surrounded by eleven O atoms at distances varying from 2.557 (5) to 3.095 (5) Å. The  $Ga^{3+}$  ions are approximately tetrahedrally [Ga(3)] or octahedrally [Ga(1) and Ga(2)] coordinated by O atoms. The Ga-O distances are in the range 1.909 (6)-2.055(6) Å and 1.902(6)-2.059(6) Å for the Ga(1) and Ga(2) octahedral sites, respectively, and between 1.830(5) and 1.873(6) Å for the tetrahedral site. The average Ga-O distances are 1.981 and 1.976 Å for the octahedral Ga(1) and Ga(2) sites and 1.848 Å for the tetrahedral site. These values are in good agreement with the distances expected from the sum of the ionic radii of  $O^{2-}$  and  $Ga^{3+}$  ions in octahedral (2.00 Å) and tetrahedral (1.85 Å) coordination according to Shannon & Prewitt (1969).

### Experimental

Single crystals were obtained by mixing stoichiometric amounts of Eu<sub>2</sub>O<sub>3</sub>, Ga<sub>2</sub>O<sub>3</sub>, MoO<sub>3</sub> and Mo, all in powder form. The mixture was pressed into a pellet and placed in a molybdenum crucible which was then sealed under a low argon pressure using an arc welding system. The mixture was heated at a rate of 300 K h<sup>-1</sup> to *ca* 1870 K, held at this temperature for 6 h, then heated up to 2220 K at 600 K h<sup>-1</sup> for 5 min and finally cooled at 100 K h<sup>-1</sup> down to 1400 K, the temperature at which the power was turned off.

Crystal data

Sr4Ga3M026O48	Mo $K\alpha$ radiation
$M_{-} = 3822.05$	$\lambda = 0.71073$ Å
Monoclinic	A = 0.71075  A
	Cen parameters from 25
$PZ_1/c$	reflections
a = 15.082(3) Å	$\theta = 8.1 - 18.0^{\circ}$
b = 9.1900(3) Å	$\mu = 16.210 \text{ mm}^{-1}$
c = 26.499(5) Å	T = 295  K
$\beta = 90.533(9)^{\circ}$	Irregular
V = 3672.5 (9) Å <sup>3</sup>	$0.19 \times 0.12 \times 0.04$ mm
Z = 4	Black
$D_x = 6.912 \text{ Mg m}^{-3}$	
$D_m$ not measured	
Data collection	
Enraf–Nonius CAD-4	7146 observed reflections
diffractometer	$[I > 2\pi(D)]$
	[I > 20(I)]
0/20 scans	$\kappa_{\rm int} = 0.036$
Absorption correction:	µ _ 27 <sup>∨</sup>

 $\theta/2\theta$  scans $R_{int}$ Absorption correction: $\theta_{max}$ empirical (6  $\psi$  scans;h =North, Phillips &k =Mathews, 1968)l = $T_{min} = 0.513$ ,  $T_{max} =$ 3 st0.999fr13 826 measured reflectionsir

10 491 independent reflections 7146 observed reflections  $[l > 2\sigma(l)]$   $R_{int} = 0.036$   $\theta_{max} = 32^{\circ}$   $h = 0 \rightarrow 22$   $k = 0 \rightarrow 13$   $l = -39 \rightarrow 39$ 3 standard reflections frequency: 90 min intensity decay: <1%

Refinement		O(25)	0.3867 (4)	0.2332 (7)	0.2599 (2)	0.57 (9)
Refinement Refinement on F R = 0.036 wR = 0.039 S = 1.325 7146 reflections 491 parameters $w = 4F_o^2/[\sigma^2(F_o^2) + 0.0009F_o^4]$ $(\Delta/\sigma)_{max} = <0.01$	$\Delta \rho_{\text{max}} = 2.21 \text{ e } \text{\AA}^{-3}$ $\Delta \rho_{\text{min}} = -3.35 \text{ e } \text{\AA}^{-3}$ Extinction correction: Stout & Jensen (1968) Extinction coefficient: 1.09 (2) × 10 <sup>-8</sup> Atomic scattering factors from Cromer & Waber (1974)	O(25) O(26) O(27) O(28) O(29) O(30) O(31) O(31) O(33) O(33) O(34) O(35) O(36) O(37) O(32)	0.3867 (4) 0.5063 (4) 0.8199 (3) 0.8901 (4) 0.3501 (3) 0.7433 (4) 0.3606 (4) 0.7107 (3) 0.6035 (4) 0.2164 (4) 0.9614 (4) 0.0344 (4)	0.2332 (7) 0.5074 (7) 0.0133 (6) 0.2361 (7) -0.0036 (7) 0.2509 (6) 0.2397 (7) 0.2508 (7) -0.0011 (7) 0.2409 (7) 0.2409 (7) 0.2455 (6) 0.4947 (7) 0.2578 (6)	0.2599 (2) 0.2522 (2) 0.2171 (2) 0.2645 (2) 0.3328 (2) 0.1577 (2) 0.1182 (2) 0.4075 (2) 0.4075 (2) 0.2252 (2) 0.6456 (2) 0.6928 (2)	$\begin{array}{c} 0.57 (9) \\ 0.78 (9) \\ 0.42 (8) \\ 0.54 (9) \\ 0.52 (9) \\ 0.59 (9) \\ 0.65 (9) \\ 0.62 (9) \\ 0.62 (9) \\ 0.44 (9) \\ 0.84 (9) \\ 0.43$
<b></b>		O(38) O(39)	0.0040 (3) 0.9227 (4)	0.0037(6) 0.2767(7)	0.2438 (2) 0.8745 (2)	0.29 (8) 0.73 (9)

O(40)

O(41)

O(42)

0.8553 (4)

0.9205 (3)

0.9642 (4)

-0.0062(7)

0.9958 (7)

0.2520 (7)

## Table 1. Fractional atomic coordinates and isotropic or equivalent isotropic displacement parameters $(Å^2)$

B	ice for O atoms	$B_{aa} = (4/3) \sum_i \sum_j$	Bua: a: for all o	others	O(43)	0.7864 (4)	0.2429 (	6) 0.9395 (2)	0.39 (9)
D	150 101 0 410/113,	$Deq = (+7.5) \Delta_1 \Delta_2$		uncrs.	O(44)	0.7484 (3)	0.9991 (	7) 0.0053 (2)	0.44 (8)
	x	у	z	$B_{\rm iso}/B_{\rm eq}$	O(45)	0.3249 (4)	0.2422 (	6) 0.0515 (2)	0.52 (9)
Mo(1)	0.58655 (4)	0.38126 (8)	0.12968 (2)	0.30(1)	O(46)	0.7083 (3)	0.0018 (	(7) 0.8861 (2)	0.36(8)
Mo(2)	0.24919 (4)	0.62050 (8)	0.83687 (2)	0.27(1)	O(47)	0.6127(3)	0.4979(	7) 0.5721 (2)	0.43 (8)
Mo(3)	0.28474 (4)	0.62240 (8)	0.93854 (2)	0.30(1)	O(48)	0.4687(4)	0.2762 (	6) 0.9827(2)	0.48 (9)
Mo(4)	0.32359 (4)	0.38213 (8)	0.88233 (2)	0.28(1)					
Mo(5)	0.11438 (4)	0.62044 (8)	0.90677 (2)	0.28 (1)				0	
Mo(6)	0.14941 (4)	0.37802 (8)	0.85095 (2)	0.28(1)		Table 2	2. Geometr	ic parameters (A	)
Mo(7)	0.18428 (4)	0.38023 (8)	0.95029 (2)	0.29(1)	Ma Chu			•	, ,
Mo(8)	0.45200 (4)	0.37677 (9)	0.30583 (3)	0.45(1)	Mo <sub>7</sub> Clus	ster i	2 594 (1)		0.107.00
Mo(9)	0.28901 (4)	0.37950 (8)	0.27189(2)	0.27(1)	MO(1)M	10(4)	2.584 (1)	M0(2)—O(4)	2.137 (6)
Mo(10)	0.39377 (4)	0.62300 (9)	0.26298 (3)	0.40(1)	Mo(1)—M	10(2)	2.6234 (9)	Mo(3)	2.025 (6)
Mo(11)	0.42890 (4)	0.37737 (8)	0.20727 (2)	0.30(1)	Mo(1)M	10(3)	2.6652 (9)	Mo(3)—O(8)	2.039 (6)
Mo(12)	0.22648 (4)	0.62042 (8)	0.22386(2)	0.28(1)	Mo(1)—M	lo(11)	3.1575 (9)*	Mo(3)—O(21)	2.055 (6)
Mo(13)	0.26136 (4)	0.37626 (8)	0.16867 (2)	0.27(1)	Mo(2)—M	lo(6)	2.7165 (9)	Mo(3)—O(10)	2.065 (6)
Mo(14)	0.36390 (4)	0.61772 (8)	0.15910(2)	0.31(1)	Mo(2)M	lo(4)	2.735 (1)	Mo(3)—O(6)	2.065 (6)
Mo(15)	0.04021 (5)	0.64271 (9)	0.68477 (3)	0.78(1)	Mo(2)M	lo(3)	2.7423 (9)	Mo(4)—O(16)	2.005 (6)
Mo(16)	0.00577 (4)	0.62443 (8)	0.58802 (3)	0.38(1)	Mo(2)—M	lo(5)	2.7633 (9)	Mo(4)—O(7)	2.031 (6)
Mo(17)	0.07519(4)	0.37678 (9)	0.62671(3)	0.55(1)	Mo(3)M	lo(5)	2.696 (1)	Mo(4)—O(8)	2.067 (6)
Mo(18)	0.03797(4)	0 38241 (8)	0.52511(3)	0.37(1)	Mo(3)—M	lo(7)	2.712(1)	Mo(4)—O(15)	2.075 (6)
Mo(19)	0.17381(4)	0.62387 (8)	0.62061 (3)	0.37(1)	Mo(3)—M	lo(4)	2.730(1)	Mo(4)—O(14)	2.099 (6)
Mo(20)	0.13947(4)	0.61672 (8)	0.51522 (3)	0.39(1)	Mo(4)M	lo(6)	2.748 (1)	Mo(5)-O(13)	1.934 (6)
Mo(21)	0.21233(4)	0 38503 (8)	0.56103(2)	0.31(1)	Mo(4)—M	lo(7)	2.7798 (9)	Mo(5)-O(10)	1.984 (6)
Mo(22)	0.32928 (4)	0.61563 (8)	0.50105(2) 0.54775(2)	0.31(1)	Mo(5)M	lo(7)	2.700(1)	Mo(5)-O(12)	2.000 (6)
$M_0(22)$	0.52728 (4)	0.61345 (8)	0.34773(2) 0.40552(2)	0.20(1)	Mo(5)—M	lo(6)	2.729(1)	Mo(5)—O(9)	2.042 (6)
$M_0(24)$	0.35250(4)	0.37364 (8)	0.48012(2)	0.20(1)	Mo(6)M	lo(7)	2.6795 (9)	Mo(5)—O(11)	2.137 (6)
Mo(25)	0.50000 (4)	0.57504 (8)	0.40712(2)	0.20(1)	Mo(1)O	(5)	2.047 (6)	Mo(6)—O(18)	1.976 (6)
$M_0(25)$	0.30497(4) 0.46172(4)	0.03243(8)	0.37064(2) 0.47623(2)	0.26(1)	Mo(1)-O	(7)	2.056 (6)	Mo(6)O(20)	1.977 (6)
$S_{r}(1)$	0.40172 (4)	0.02301 (0)	0.47023(2)	0.23(1)	Mo(1)O	(8)	2.073 (6)	Mo(6)O(14)	1.985 (6)
$S_{r}(2)$	0.22722(3)	0.3032(1)	0.39130(3)	0.50(1)	Mo(1)-O	(2)	2.085 (6)	Mo(6)-O(12)	2.055 (6)
$S_{r}(2)$	0.33117(3)	0.4900(1)	0.72070(3)	0.04(1)	Mo(1)-O	(3)	2.110 (6)	Mo(6)—O(17)	2.082 (7)
Sr(3)	0.11374(0)	0.0083(1)	0.30290(3)	1.22(2)	Mo(1)-O	(1)	2.129 (5)	Mo(7)-O(21)	1.922 (6)
$G_{\alpha}(1)$	0.39749(3)	0.3008(1)	0.93913(3)	0.70(1)	Mo(2)O	(5)	2.018 (6)	Mo(7)-O(13)	1,996 (6)
$G_{a}(1)$	0.11230(0)	0.1378(1)	0.24194(3)	0.42(1)	Mo(2)O	(7)	2.024 (6)	$M_0(7) = O(15)$	2.001 (6)
Ga(2)	0.92023 (6)	0.3620(1)	0.70342(3)	0.41 (1)	Mo(2)O	(9)	2.064 (6)	$M_0(7) - O(18)$	2.031 (6)
O(1)	0.03472(0)	0.0340(1)	0.09414(4)	0.48 (2)	Mo(2)O	(20)	2.075 (6)	$M_0(7) - O(19)$	2,163 (6)
O(1)	0.4003 (3)	0.0042(7)	0.6434(2)	0.47 (8)	Ma Chu		. ,		- (-)
O(2)	0.5396 (4)	0.2383(0)	0.0907(2)	0.40 (9)	March Clus		2 (10 (1)	M.(0) 0(14)	2.126.46
O(3)	0.3020 (4)	0.2318(0)	0.0841 (2)	0.33(9)	M0(8)M	0(9)	2.610(1)	MO(9) = O(14)	2.136 (6)
0(4)	0.7136(4)	0.2404 (6)	0.7288(2)	0.42 (9)	MO(8)M	0(11)	2.032(11)	MO(10)	2.025 (6)
0(5)	0.0873(4)	0.2362 (6)	0.1177(2)	0.51 (9)	M0(8)M	0(10)	2.6/6(1)	Mo(10)O(2)	2.026 (6)
0(0)	0.0439(4)	0.2439(0)	0.5102(2)	0.49 (9)	M0(8)M	0(25)	3.171 (1)	M0(10)	2.038 (6)
O(7)	0.3514(3)	0.0104(7)	0.3174(2)	0.50 (9)	M0(9)—M	0(12)	2.718(1)	Mo(10) = O(4)	2.065 (6)
	0.3902(3)	0.0026(7)	0.4354 (2)	0.53 (9)	M0(9)M	0(11)	2.7298 (9)	Mo(10)O(22)	2.080 (6)
0(9)	0.8589(4)	0.2454(7)	0.1527(2)	0.57 (9)	Mo(9)—M	0(10)	2.750(1)	Mo(11)O(25)	2.032 (6)
O(10)	0.8219(4)	0.2572(6)	0.5477(2)	0.44 (9)	M0(9)M	0(13)	2.7630(9)	Mo(11)O(2)	2.034 (6)
O(11)	0.0030(4)	0.2531 (6)	0.0826(2)	0.49 (9)	Mo(10)	MO(12)	2.720(1)	Mo(11)O(26)	2.044 (6)
O(12)	0.0384(3)	-0.0053(7)	0.3591 (2)	0.37 (8)	Mo(10)—M	Mo(11)	2.751(1)	Mo(11)—O(31)	2.092 (6)
0(13)	0.9244 (3)	0.9989(7)	0.5381(2)	0.42 (8)	Mo(10)	MO(14)	2.786(1)	Mo(11)O(1)	2.094 (6)
0(14)	0.2482 (4)	0.2423(7)	0.8363 (2)	0.57 (9)	M0(11)N	NO(13)	2.717(1)	Mo(12)—O(30)	1.978(6)
0(15)	0.2868 (4)	0.2452 (6)	0.9407 (2)	0.54 (9)	Mo(11)—N	/10(14)	2.728(1)	Mo(12)O(27)	1.982 (6)
U(16)	0.4246 (4)	0.2458 (6)	0.8693 (2)	0.51 (9)	Mo(12)	Mo(14)	2.7031 (9)	Mo(12)	2.000 (6)
0(17)	0.0695 (4)	0.2611 (7)	0.8009 (2)	0.8(1)	Mo(12)—N	Mo(13)	2.732(1)	Mo(12)	2.019 (6)
O(18)	0.1094 (4)	0.2518 (6)	0.4056(2)	0.41 (9)	Mo(13)—N	Mo(14)	2.718(1)	Mo(12)O(28)	2.081 (6)
U(19)	0.1432 (4)	0.2487 (6)	0.5142 (2)	0.34 (9)	Mo(8)—O	(26)	2.037 (6)	Mo(13)—O(33)	1.925 (6)
0(20)	0.1764 (4)	0.4874 (7)	0.7887 (2)	0.60 (9)	Mo(8)O	(25)	2.041 (6)	Mo(13)O(31)	1.978 (6)
O(21)	0.7532(3)	0.9974 (6)	0.5010(2)	0.40 (8)	Mo(8)—O	(24)	2.055 (6)	Mo(13)—O(29)	2.028 (6)
O(22)	0.5691 (4)	0.2549 (7)	0.2970 (2)	0.54 (9)	Mo(8)O	(16)	2.071 (6)	Mo(13)—O(35)	2.040 (6)
O(23)	0.5289 (3)	0.0112 (7)	0.8593 (2)	0.48 (9)	Mo(8)—O	(23)	2.093 (6)	Mo(13)O(32)	2.141 (6)
O(24)	0.6522 (4)	0.4891 (7)	0.6762 (2)	0.9(1)	Mo(8)—O	(22)	2.104 (6)	Mo(14)—O(1)	1.956 (6)

0.75 (9) 1.0 (1) 0.57 (9) 0.65 (9)

0.8178 (2) 0.0414 (2)

0.4742 (2)

## 1866

# $Sr_4Ga_3Mo_{26}O_{48}$

	2.022 (6)	Mo(14)—O(22)	1.987 (6)	Sr(2)—O(46)	2.886 (6)	Sr(4)—O(1)	2.876 (6)
Mo(9)—O(24)	2.027 (6)	Mo(14)O(33)	1.999 (6)	Sr(2)—O(30)	2.938 (6)	Sr(4)—O(3)	2.914 (6)
Mo(9)—O(35)	2.055 (6)	Mo(14)—O(30)	2.040 (6)	Sr(2)—O(20)	2.964 (5)	Sr(4)—O(48)	2.945 (6)
Mo(9)—O(27)	2.075 (6)	Mo(14)—O(34)	2.157 (6)	Sr(2) = O(40)	2.984 (6)	Sr(4)—O(8)	3.095 (5)
Mo <sub>24</sub> Tricluster				Sr(2) = O(23)	3.008 (6)		
(a) Mo <sub>7</sub> Subcluster				Ga-atom environments			
Mo(15)—Mo(16)	2.616(1)	Mo(16)—O(36)	2.052 (6)	Ga(1) - O(35)	1.909 (6)	Ga(2) = O(27)	1.934 (5)
Mo(15)—Mo(19)	2.654 (1)	Mo(16)—O(42)	2.055 (6)	Ga(1) = O(17)	1.936 (6)	Ga(2) = O(37)	1.993 (6)
Mo(15)—Mo(17)	2.938 (1)	$M_0(16) = O(18)$	2.083 (6)	$G_{2}(1) = O(20)$	1.941 (0)	Ga(2) = O(38)	2.058 (6)
Mo(16) - Mo(19) Mu(16) - Mu(17)	2.670(1)	Mo(16) = O(41) Mo(17) = O(32)	2.089 (6)	Ga(1) = O(37)	2 050 (6)	$G_a(2) = O(30)$ $G_a(3) = O(38)$	2.039(0)
MO(10) - MO(17) Mo(16) - Mo(20)	2.705(1)	$M_0(17) = O(32)$ $M_0(17) = O(11)$	1.964 (0)	Ga(1) - O(40)	2.055 (6)	Ga(3) - O(12)	1.837 (6)
$M_0(16) - M_0(18)$	2.824(1)	$M_0(17) = O(40)$	2.092 (6)	Ga(2)O(9)	1.902 (6)	Ga(3)—O(29)	1.851 (5)
$M_0(16) - M_0(18)$	3.064 (1)±	$M_0(17) - O(36)$	2.094 (6)	Ga(2)—O(28)	1.912 (6)	Ga(3)-O(37)	1.873 (6)
Mo(17)—Mo(21)	2.7166 (9)	Mo(17)—O(37)	2.156 (6)				
Mo(17)—Mo(19)	2.720 (9)	Mo(18)-O(19)	2.028 (6)	* Between isolated Mo7	clusters. †	Between isolated M	lo7 clusters and
Mo(17)—Mo(18)	2.745 (9)	Mo(18)O(11)	2.041 (6)	Mo <sub>10</sub> clusters of the tri	cluster chain	fragments. ‡ Betw	veen Mo7 clus-
Mo(18)—Mo(20)	2.657 (1)	Mo(18)O(42)	2.112 (6)	ters of different triclust	er chain frag	ments within a chai	n. § Between
$M_0(18) = M_0(18)$	2.780(1)‡	Mo(18) = O(41)	2.143 (6)	Mo7 and Mo10 subclust	ters of the sar	ne tricluster chain f	ragment.
MO(18) - MO(21) MO(18) - MO(20)	2.788(1)	Mo(18) = O(41) Mo(10) = O(43)	2.147 (6)	Data wara corrected	for Lorent	and notorization	offacto The
$M_0(18) = M_0(20)$ $M_0(19) = M_0(21)$	$2.873(1)_{4}$	$M_0(19) = O(43)$ $M_0(19) = O(39)$	2.028 (0)	Data were conected			i enects. The
Mo(19) - Mo(20)	2.836(1)	Mo(19) = O(40)	2.072 (6)	structure was solved	i using SHI	LASSO (Sheldric	k, 1990) and
Mo(19)—Mo(22)	3.0520 (9)§	Mo(19)-O(30)	2.094 (6)	subsequent difference	ce Fourier	syntheses. Refine	ement of the
Mo(20)—Mo(21)	2.681 (1)	Mo(19)—O(46)	2.111 (5)	occupancy factors for	or the Sr, G	a and Mo sites c	onfirmed that
Mo(20)—Mo(22)	2.982 (1)§	Mo(20)—O(42)	1.998 (6)	they are fully occur	pied. Calcu	lations were per	formed on a
Mo(21)—Mo(22)	2.7816 (9)§	Mo(20)—O(43)	2.002 (6)	Digital Pentium Ce	lebris 590	FP for SHELXS	86 and on a
Mo(21)—Mo(24)	3.0493 (9)§	Mo(20)O(41)	2.070 (6)	Digital MicroVAX 3	100 for the	MolEN (Fair 199	0) programs
Mo(21)—Mo(23)	3.059 (1)§	Mo(20)	2.084 (5)	Data collection:	CAD-A Sol	tware (Enraf_No	$n_{1080}$
$M_0(15) = O(17)$ $M_0(15) = O(28)$	2.019(6)	$M_0(20) = O(10)$ $M_0(21) = O(22)$	2.11/(0)	Coll refinements C	CAD - 7 SOJ	iware (Linai-ive	tion: MolEN
$M_0(15) = O(28)$ $M_0(15) = O(39)$	2.030(0)	$M_0(21) = O(32)$ $M_0(21) = O(19)$	2.027 (0)		4D-4 Sojin	are. Data reduc	uon: MOLEN
$M_0(15) = O(36)$	2.078 (6)	$M_0(21) = O(45)$	2.045(0)	(Fair, 1990). Progra	am(s) used	to refine struct	ure: MolEN.
Mo(15)—O(40)	2.088 (6)	Mo(21)—O(46)	2.126 (6)	Molecular graphics:	ORTEPII (.	Johnson, 1976). S	oftware used
Mo(15)O(38)	2.136 (6)	Mo(21)—O(44)	2.135 (6)	to prepare material f	for publicati	on: MolEN.	
Mo(16)—O(39)	2.023 (6)						
(b) $Mo_{10}$ Subcluster $M_{2}(22)$	2 7045 (0)	Ma(22) 0(2)	1.044 (6)	Lists of structure fact	ors, anisotro	nic displacement r	arameters and
MO(22) = MO(23) Mo(22) = Mo(25)	2.7045 (9)	MO(23) = O(3)	1.944 (6)	complete geometry ha	ve heen den	osited with the IU	Cr (Reference:
$M_0(22) = M_0(23)$ $M_0(22) = M_0(26)$	2.737(1)	$M_0(23) = O(45)$ $M_0(23) = O(46)$	2.031 (6)	DU1150) Copies may	be obtained	through The Ma	naging Editor
$M_0(22) = M_0(24)$	2.781(1)	$M_0(23) = O(31)$	2.104 (5)	International Union of (	Crystallwarar	by 5 Abbey Source	Chaster CUI
$M_{2}(22) = M_{2}(21)$	2.701(1)	0(23) - 0(31)	2.157 (0)	international Onion of s	Crystanograp	iny, J ADDEY Syuan	
$WO(2.5 \rightarrow MO(26))$	2.7399(9)	$M_0(24) = O(47)$	2 026 (6)	2011 England		<b>5 5</b> 1	, enester erri
MO(23) - MO(26) Mo(23) - Mo(25)	2.7399(9) 2.7423(9)	Mo(24)—O(47) Mo(24)—O(48)	2.026 (6) 2.049 (6)	2HU, England.			
Mo(23)—Mo(26) Mo(23)—Mo(25) Mo(23)—Mo(24)	2.7399 (9) 2.7423 (9) 2.8478 (9)	Mo(24)—O(47) Mo(24)—O(48) Mo(24)—O(45)	2.026 (6) 2.049 (6) 2.079 (6)	2HU, England.			
Mo(23)—Mo(26) Mo(23)—Mo(25) Mo(23)—Mo(24) Mo(24)—Mo(25)	2.7399 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9)	Mo(24)—O(47) Mo(24)—O(48) Mo(24)—O(45) Mo(24)—O(15)	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6)	2HU, England.			
MO(23)—MO(26) MO(23)—MO(25) MO(23)—MO(24) MO(24)—MO(25) MO(24)—MO(26)	2.7399 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7072 (9)	Mo(24)O(47) Mo(24)O(48) Mo(24)O(45) Mo(24)O(15) Mo(24)O(44)	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6)	2HU, England.			
MO(23)—MO(26) MO(23)—MO(25) MO(23)—MO(24) MO(24)—MO(25) MO(24)—MO(26) MO(24)—MO(26)	2.7399 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9)	Mo(24)O(47) Mo(24)O(48) Mo(24)O(45) Mo(24)O(15) Mo(24)O(44) Mo(25)O(47)	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.046 (6)	2HU, England.			
MO(23)—MO(26) MO(23)—MO(25) MO(23)—MO(24) MO(24)—MO(25) MO(24)—MO(26) MO(24)—MO(26) MO(25)—MO(26) MO(26) MO(26)	2.7399 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.7400 (9)		2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.046 (6) 2.054 (6)	2HU, England. References Cromer, D. T. & Wal	ber, J. T. (1	974). International	Tables for X-
MO(23)—MO(26) MO(23)—MO(25) MO(23)—MO(24) MO(24)—MO(25) MO(24)—MO(26) MO(24)—MO(26) MO(25)—MO(26) MO(26)—MO(26) MO(26)—MO(26)	2.7399 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.7400 (9) 2.789 (1) 2.838 (1)	$\begin{array}{l} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(44) \\ Mo(25) - O(47) \\ Mo(25) - O(34) \\ Mo(25) - O(16) \\ Mo(25) - O(23) \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.046 (6) 2.054 (6) 2.054 (6)	2HU, England. References Cromer, D. T. & Wall ray Crystallography,	ber, J. T. (1'	974). International ble 2.2A, pp. 72–98	Tables for X-
$\begin{array}{c} Mo(25) &Mo(26) \\ Mo(23) &Mo(25) \\ Mo(23) &Mo(24) \\ Mo(24) &Mo(26) \\ Mo(24) &Mo(26) \\ Mo(24) &Mo(26) \\ Mo(25) &Mo(26) \\ Mo(25) &Mo(26) \\ Mo(26) &Mo(26) \\ Mo(22) &Mo(34) \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6)	$\begin{array}{l} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(44) \\ Mo(25) - O(47) \\ Mo(25) - O(34) \\ Mo(25) - O(16) \\ Mo(25) - O(23) \\ Mo(25) - O(48) \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.046 (6) 2.054 (6) 2.054 (6) 2.094 (6) 2.094 (6)	2HU, England. <b>References</b> Cromer, D. T. & Wat <i>ray Crystallography</i> , Kynoch Press, (Pres	ber, J. T. (1 , Vol. IV, Tal sent distribut	974). International ole 2.2A, pp. 72–98 or Kluwer Acader	Tables for X-
$\begin{array}{c} Mo(25) &Mo(26) \\ Mo(23) &Mo(25) \\ Mo(23) &Mo(24) \\ Mo(24) &Mo(26) \\ Mo(24) &Mo(26) \\ Mo(25) &Mo(26) \\ Mo(25) &Mo(26) \\ Mo(25) &Mo(26) \\ Mo(26) &Mo(26) \\ Mo(22) &O(34) \\ Mo(22) &O(6) \end{array}$	2.7399 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6)	$\begin{array}{l} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(44) \\ Mo(25) - O(47) \\ Mo(25) - O(34) \\ Mo(25) - O(16) \\ Mo(25) - O(23) \\ Mo(25) - O(48) \\ Mo(26) - O(6) \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.046 (6) 2.054 (6) 2.054 (6) 2.094 (6) 2.098 (6)	2HU, England. References Cromer, D. T. & Wal ray Crystallography, Kynoch Press. (Pres Dordrecht.)	ber, J. T. (1' , Vol. IV, Tal sent distribut	974). International ble 2.2A, pp. 72–98 or Kluwer Acader	Tables for X- Birmingham: nic Publishers,
MO(23)—MO(26) MO(23)—MO(25) MO(23)—MO(24) MO(24)—MO(26) MO(24)—MO(26) MO(25)—MO(26) MO(25)—MO(26) MO(25)—MO(26) MO(22)—O(34) MO(22)—O(6) MO(22)—O(44)	2.7399 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.114 (6)	$\begin{array}{l} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(25) - O(44) \\ Mo(25) - O(47) \\ Mo(25) - O(34) \\ Mo(25) - O(16) \\ Mo(25) - O(23) \\ Mo(25) - O(48) \\ Mo(26) - O(6) \\ Mo(26) - O(47) \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.054 (6) 2.054 (6) 2.054 (6) 2.094 (6) 2.098 (6) 2.028 (6) 2.021 (6)	2HU, England. <b>References</b> Cromer, D. T. & Wal <i>ray Crystallography</i> , Kynoch Press. (Press. Dordrecht.) Dronskowski, R. & Si	ber, J. T. (1' , Vol. IV, Tal sent distribut mon. A. (19:	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem.	Tables for X- Birmingham: nic Publishers, Int. Ed. Enel.
MO(23)—MO(26) MO(23)—MO(25) MO(23)—MO(24) MO(24)—MO(26) MO(24)—MO(26) MO(25)—MO(26) MO(25)—MO(26) MO(25)—MO(26) MO(22)—O(34) MO(22)—O(44) MO(22)—O(46)	2.7399 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.71072 (9) 2.7136 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.114 (6) 2.123 (6)	$\begin{array}{l} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(15) \\ Mo(25) - O(44) \\ Mo(25) - O(47) \\ Mo(25) - O(16) \\ Mo(25) - O(23) \\ Mo(25) - O(48) \\ Mo(26) - O(6) \\ Mo(26) - O(47) \\ Mo(26) - O(48) \\ \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.054 (6) 2.054 (6) 2.054 (6) 2.098 (6) 2.028 (6) 2.031 (6) 2.038 (6)	2HU, England. <b>References</b> Cromer, D. T. & Wal <i>ray Crystallography</i> , Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si <b>6</b> , 758–760.	ber, J. T. (1' , Vol. IV, Tal sent distribut mon, A. (19:	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem.	Tables for X- Birmingham: nic Publishers, Int. Ed. Engl.
$\begin{array}{c} Mo(23) &Mo(26) \\ Mo(23) &Mo(25) \\ Mo(23) &Mo(24) \\ Mo(24) &Mo(26) \\ Mo(24) &Mo(26) \\ Mo(25) &Mo(26) \\ Mo(25) &Mo(26) \\ Mo(26) &Mo(26) \\ Mo(22) &O(34) \\ Mo(22) &O(4) \\ Mo(22) &O(44) \\ Mo(22) &O(43) \end{array}$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.114 (6) 2.123 (6)	$\begin{array}{l} Mo(24)O(47)\\ Mo(24)O(48)\\ Mo(24)O(45)\\ Mo(24)O(15)\\ Mo(25)O(44)\\ Mo(25)O(47)\\ Mo(25)O(34)\\ Mo(25)O(16)\\ Mo(25)O(23)\\ Mo(25)O(48)\\ Mo(26)O(6)\\ Mo(26)O(48)\\ Mo(26)O(48)\\ Mo(26)O(3)\\ \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.054 (6) 2.054 (6) 2.054 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.031 (6) 2.058 (6) 2.060 (6)	2HU, England. <b>References</b> Cromer, D. T. & Wal <i>ray Crystallography</i> , Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si <b>6</b> , 758–760. Dronskowski, R. Simu	ber, J. T. (1' , Vol. IV, Tal sent distribut mon, A. (19: on, A & M	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin W (1991) 2	Tables for X- Birmingham: nic Publishers, Int. Ed. Engl.
$\begin{array}{c} Mo(23) &= Mo(26) \\ Mo(23) &= Mo(25) \\ Mo(23) &= Mo(24) \\ Mo(24) &= Mo(26) \\ Mo(24) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(26) &= Mo(26) \\ Mo(22) &= O(34) \\ Mo(22) &= O(44) \\ Mo(22) &= O(44) \\ Mo(22) &= O(43) \\ Mo(23) &= O(23) \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.77400 (9) 2.7789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.1123 (6) 2.123 (6) 1.930 (6)	$\begin{array}{l} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(47) \\ Mo(25) - O(47) \\ Mo(25) - O(34) \\ Mo(25) - O(16) \\ Mo(25) - O(16) \\ Mo(25) - O(48) \\ Mo(26) - O(6) \\ Mo(26) - O(47) \\ Mo(26) - O(48) \\ Mo(26) - O(3) \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.054 (6) 2.054 (6) 2.054 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.058 (6) 2.058 (6)	2HU, England. <b>References</b> Cromer, D. T. & Wal <i>ray Crystallography</i> , Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si <b>6</b> , 758–760. Dronskowski, R., Simu <i>Chem</i> , <b>602</b> . 49–63.	ber, J. T. (1' , Vol. IV, Tal sent distribut mon, A. (19: on, A. & M	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin, W. (1991). 2	Tables for X- Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg.
$\begin{array}{l} Mo(23) &= Mo(26) \\ Mo(23) &= Mo(25) \\ Mo(23) &= Mo(24) \\ Mo(24) &= Mo(26) \\ Mo(24) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(26) &= Mo(26) \\ Mo(22) &= O(34) \\ Mo(22) &= O(34) \\ Mo(22) &= O(44) \\ Mo(22) &= O(44) \\ Mo(22) &= O(43) \\ Mo(23) &= O(23) \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.7789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.114 (6) 2.123 (6) 2.130 (6) 1.930 (6)	$\begin{array}{l} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(15) \\ Mo(25) - O(14) \\ Mo(25) - O(34) \\ Mo(25) - O(16) \\ Mo(25) - O(16) \\ Mo(25) - O(48) \\ Mo(26) - O(6) \\ Mo(26) - O(47) \\ Mo(26) - O(48) \\ Mo(26) - O(3) \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.054 (6) 2.054 (6) 2.094 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.058 (6) 2.058 (6)	2HU, England. <b>References</b> Cromer, D. T. & Wal <i>ray Crystallography</i> , Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si <b>6</b> , 758–760. Dronskowski, R., Simu <i>Chem.</i> <b>602</b> , 49–63. Enraf–Nonius (1989).	ber, J. T. (1 , Vol. IV, Tal sent distribut mon, A. (19 on, A. & M <i>CAD-4 Soft</i>	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin, W. (1991). 2 ware. Version 5.0.	Tables for X- Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius.
$\begin{array}{l} Mo(23) & Mo(26) \\ Mo(23) & Mo(25) \\ Mo(23) & Mo(24) \\ Mo(24) & Mo(26) \\ Mo(24) & Mo(26) \\ Mo(25) & Mo(26) \\ Mo(25) & Mo(26) \\ Mo(25) & Mo(26) \\ Mo(22) & O(34) \\ Mo(22) & O(34) \\ Mo(22) & O(44) \\ Mo(22) & O(46) \\ Mo(22) & O(43) \\ Mo(23) & O(23) \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.123 (6) 2.130 (6) 1.930 (6)	Mo(24) - O(47) $Mo(24) - O(48)$ $Mo(24) - O(45)$ $Mo(24) - O(15)$ $Mo(24) - O(47)$ $Mo(25) - O(34)$ $Mo(25) - O(16)$ $Mo(25) - O(16)$ $Mo(25) - O(16)$ $Mo(26) - O(6)$ $Mo(26) - O(48)$ $Mo(26) - O(48)$ $Mo(26) - O(3)$ $Sr(3) - O(39)$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.054 (6) 2.054 (6) 2.094 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.058 (6) 2.060 (6)	2HU, England. References Cromer, D. T. & Wal ray Crystallography, Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si 6, 758–760. Dronskowski, R., Simu Chem. 602, 49–63. Enraf–Nonius (1989). Delft. The Netherlan	ber, J. T. (1 <sup>1</sup> , Vol. IV, Tal sent distribut mon, A. (19 on, A. & M <i>CAD-4 Soft</i> n ds.	974). International ole 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin, W. (1991). 2 vare. Version 5.0.	Tables for X- Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius,
$\begin{array}{l} Mo(23) & Mo(26) \\ Mo(23) & Mo(25) \\ Mo(23) & Mo(24) \\ Mo(24) & Mo(26) \\ Mo(24) & Mo(26) \\ Mo(25) & Mo(26) \\ Mo(25) & Mo(26) \\ Mo(25) & Mo(26) \\ Mo(26) & Mo(26) \\ Mo(22) & O(34) \\ Mo(22) & O(34) \\ Mo(22) & O(44) \\ Mo(22) & O(43) \\ Mo(23) & O(23) \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.114 (6) 2.130 (6) 1.930 (6) 2.513 (6) 2.516 (6)	$\begin{array}{l} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(15) \\ Mo(25) - O(47) \\ Mo(25) - O(34) \\ Mo(25) - O(34) \\ Mo(25) - O(16) \\ Mo(25) - O(23) \\ Mo(25) - O(48) \\ Mo(26) - O(6) \\ Mo(26) - O(48) \\ Mo(26) - O(3) \\ \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.033 (6) 2.046 (6) 2.054 (6) 2.094 (6) 2.094 (6) 2.098 (6) 2.028 (6) 2.058 (6) 2.060 (6) 2.640 (6) 2.641 (5)	2HU, England. <b>References</b> Cromer, D. T. & Walt ray Crystallography, Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si <b>6</b> , 758–760. Dronskowski, R., Sime Chem. <b>602</b> , 49–63. Enraf–Nonius (1989). Delft, The Netherlan Fair, C. K. (1990). A	ber, J. T. (1) , Vol. IV, Tal sent distribut mon, A. (19) on, A. & M <i>CAD-4 Soft</i> dol. <i>An JEN An J</i>	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin, W. (1991). 2 vare. Version 5.0.	Tables for X- . Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius, ant. System for
$\begin{array}{l} Mo(23) &Mo(26) \\ Mo(23) &Mo(25) \\ Mo(23) &Mo(24) \\ Mo(24) &Mo(26) \\ Mo(24) &Mo(26) \\ Mo(25) &Mo(26) \\ Mo(25) &Mo(26) \\ Mo(26) &Mo(26) \\ Mo(26) &Mo(26) \\ Mo(22) &O(34) \\ Mo(22) &O(44) \\ Mo(22) &O(44) \\ Mo(22) &O(43) \\ Mo(23) &O(23) \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7136 (9) 2.7136 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.038 (6) 2.114 (6) 2.133 (6) 2.130 (6) 1.930 (6) 2.513 (6) 2.556 (6) 2.592 (5)	$\begin{array}{l} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(15) \\ Mo(25) - O(47) \\ Mo(25) - O(34) \\ Mo(25) - O(34) \\ Mo(25) - O(16) \\ Mo(25) - O(23) \\ Mo(25) - O(48) \\ Mo(26) - O(6) \\ Mo(26) - O(48) \\ Mo(26) - O(3) \\ \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.033 (6) 2.046 (6) 2.054 (6) 2.054 (6) 2.094 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.058 (6) 2.060 (6) 2.640 (6) 2.641 (5) 2.709 (5)	2HU, England. References Cromer, D. T. & Wal ray Crystallography, Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si 6, 758–760. Dronskowski, R., Sime Chem. 602, 49–63. Enraf–Nonius (1989). Delft, The Netherlam Fair, C. K. (1990). M Crystal Structure An	ber, J. T. (1 <sup>1</sup> , Vol. IV, Tal sent distribut mon, A. (19) on, A. & M <i>CAD-4 Soft</i> <i>CAD-4 Soft</i> <i>MolEN. An I</i>	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin, W. (1991). 2 vare. Version 5.0. interactive Intellige -Nonius Delft The	Tables for X- . Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius, ont System for
$\begin{array}{l} Mo(23) &= Mo(26) \\ Mo(23) &= Mo(25) \\ Mo(23) &= Mo(24) \\ Mo(24) &= Mo(26) \\ Mo(24) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(22) &= O(34) \\ Mo(22) &= O(44) \\ Mo(22) &= O(44) \\ Mo(22) &= O(44) \\ Mo(23) &= O(23) \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7136 (9) 2.7136 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.114 (6) 2.123 (6) 2.130 (6) 1.930 (6) 2.513 (6) 2.552 (5) 2.5706 (6)	$\begin{array}{l} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(47) \\ Mo(25) - O(47) \\ Mo(25) - O(34) \\ Mo(25) - O(34) \\ Mo(25) - O(16) \\ Mo(25) - O(23) \\ Mo(25) - O(48) \\ Mo(26) - O(48) \\ Mo(26) - O(48) \\ Mo(26) - O(3) \\ \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.033 (6) 2.046 (6) 2.054 (6) 2.054 (6) 2.094 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.058 (6) 2.060 (6) 2.640 (6) 2.641 (5) 2.709 (5) 2.732 (6)	2HU, England. <b>References</b> Cromer, D. T. & Walt ray Crystallography, Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si <b>6</b> , 758–760. Dronskowski, R., Sime Chem. <b>602</b> , 49–63. Enraf–Nonius (1989). Delft, The Netherlan Fair, C. K. (1990). M Crystal Structure An Gall P (1993). Thesis	ber, J. T. (1' , Vol. IV, Tal sent distribut mon, A. (19: on, A. & M <i>CAD-4 Soft</i> <i>doleN. An I</i> <i>lalysis.</i> Enraf University	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin, W. (1991). 2 ware. Version 5.0. Interactive Intellige -Nonius, Delft, Tho of Rennes, France	Tables for X- Design Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius, ant System for e Netherlands.
$\begin{array}{l} Mo(2.5) &= Mo(2.6) \\ Mo(2.3) &= Mo(2.5) \\ Mo(2.3) &= Mo(2.6) \\ Mo(2.4) &= Mo(2.6) \\ Mo(2.6) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.2) &= O(3.4) \\ Mo(2.2) &= O(4.4) \\ Mo(2.2) &= O(4.4) \\ Mo(2.2) &= O(4.4) \\ Mo(2.3) &= O(2.3) \\ \begin{array}{l} \mathbf{Sr} \text{-atom environments} \\ Sr(1) &= O(2.4) \\ Sr(1) &= O(1.4) \\ Sr(1) &= O(1.4) \\ Sr(1) &= O(4.4) \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7107 (9) 2.7136 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.114 (6) 2.123 (6) 2.123 (6) 2.130 (6) 2.513 (6) 2.559 (5) 2.766 (6) 2.759 (6)	$\begin{array}{l} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(15) \\ Mo(25) - O(44) \\ Mo(25) - O(47) \\ Mo(25) - O(16) \\ Mo(25) - O(23) \\ Mo(25) - O(48) \\ Mo(26) - O(48) \\ Mo(26) - O(48) \\ Mo(26) - O(48) \\ Mo(26) - O(47) \\ Mo(26) - O(48) \\ Mo(26) - O(17) \\ Mo(26) - O(19) \\ Sr(3) - O(19) \\ Sr(3) - O(13) \\ \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.016 (6) 2.054 (6) 2.054 (6) 2.094 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.031 (6) 2.058 (6) 2.060 (6) 2.641 (5) 2.709 (5) 2.732 (6) 2.735 (6)	2HU, England. <b>References</b> Cromer, D. T. & Walt ray Crystallography, Kynoch Press. (Pres- Dordrecht.) Dronskowski, R. & Si <b>6</b> , 758–760. Dronskowski, R., Simu- Chem. <b>602</b> , 49–63. Enraf–Nonius (1989). Delft, The Netherlan Fair, C. K. (1990). M Crystal Structure An Gall, P. (1993). Thesis Gall P. & Gougeon P.	ber, J. T. (1 <sup>1</sup> , Vol. IV, Tal sent distribut mon, A. (19) on, A. & M <i>CAD-4 Soft</i> dolEN. An <i>1</i> <i>calysis</i> . Enraf , University <i>6</i> (1994) Act	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin, W. (1991). 2 vare. Version 5.0. Interactive Intellige -Nonius, Delft, The of Rennes, France. a Cryst C50 7–9	Tables for X- Design Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius, ent System for e Netherlands.
$\begin{array}{l} Mo(23) &= Mo(26) \\ Mo(23) &= Mo(25) \\ Mo(23) &= Mo(24) \\ Mo(24) &= Mo(26) \\ Mo(24) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(22) &= O(34) \\ Mo(22) &= O(44) \\ Mo(22) &= O(44) \\ Mo(22) &= O(44) \\ Mo(23) &= O(23) \\ \begin{array}{l} \mathbf{Sr} \\ rl &= O(24) \\ Sr(1) &= O(24) \\ Sr(1) &= O(14) \\ Sr(1) &= O(14) \\ Sr(1) &= O(15) \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7107 (9) 2.7136 (9) 2.7400 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.113 (6) 2.123 (6) 2.123 (6) 2.123 (6) 2.130 (6) 2.513 (6) 2.559 (5) 2.706 (6) 2.759 (6) 2.776 (6)	$\begin{array}{l} Mo(24) & \longrightarrow (47) \\ Mo(24) & \longrightarrow (47) \\ Mo(24) & \longrightarrow (48) \\ Mo(24) & \longrightarrow (46) \\ Mo(24) & \longrightarrow (44) \\ Mo(25) & \longrightarrow (44) \\ Mo(25) & \longrightarrow (44) \\ Mo(25) & \longrightarrow (47) \\ Mo(25) & \longrightarrow (48) \\ Mo(25) & \longrightarrow (48) \\ Mo(26) & \longrightarrow (47) \\ Mo(26) & \longrightarrow (47) \\ Mo(26) & \longrightarrow (48) \\ Mo(26) & \longrightarrow (42) \\ Sr(3) & \longrightarrow (42) \\ Sr(3) & \longrightarrow (42) \\ Sr(3) & \longrightarrow (13) \\ Sr(3) & \longrightarrow (43) \\ \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.054 (6) 2.054 (6) 2.054 (6) 2.098 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.031 (6) 2.058 (6) 2.060 (6) 2.640 (6) 2.641 (5) 2.732 (6) 2.735 (6) 2.737 (6)	2HU, England. <b>References</b> Cromer, D. T. & Wal ray Crystallography, Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si <b>6</b> , 758–760. Dronskowski, R., Simu Chem. <b>602</b> , 49–63. Enraf–Nonius (1989). Delft, The Netherlan Fair, C. K. (1990). M Crystal Structure An Gall, P. (1993). Thesis Gall, P. Tounet L. &	ber, J. T. (1 <sup>4</sup> , Vol. IV, Tal sent distribut mon, A. (19 <sup>4</sup> on, A. & M <i>CAD-4 Soft</i> dol. <i>AolEN. An I</i> <i>alysis.</i> Enraf , University of Courseon P	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin, W. (1991). 2 vare. Version 5.0. nteractive Intellige -Nonius, Delft, The of Rennes, France. a Cryst. C <b>50</b> , 7–9. (1993) Acta Cry.	Tables for X- Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius, ent System for Netherlands.
$\begin{array}{l} Mo(23) & Mo(26) \\ Mo(23) & Mo(25) \\ Mo(23) & Mo(24) \\ Mo(24) & Mo(26) \\ Mo(24) & Mo(26) \\ Mo(25) & Mo(26) \\ Mo(25) & Mo(26) \\ Mo(25) & Mo(26) \\ Mo(22) & O(34) \\ Mo(22) & O(34) \\ Mo(22) & O(44) \\ Mo(22) & O(44) \\ Mo(22) & O(43) \\ Mo(23) & O(23) \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.7423 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.7400 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.114 (6) 2.123 (6) 2.123 (6) 2.130 (6) 1.930 (6) 2.513 (6) 2.566 (6) 2.579 (6) 2.776 (6) 2.824 (6)	$\begin{array}{c} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(15) \\ Mo(25) - O(16) \\ Mo(25) - O(23) \\ Mo(25) - O(16) \\ Mo(25) - O(23) \\ Mo(26) - O(48) \\ Mo(26) - O(13) \\ Sr(3) - $	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.054 (6) 2.054 (6) 2.098 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.031 (6) 2.060 (6) 2.640 (6) 2.640 (6) 2.641 (5) 2.732 (6) 2.735 (6) 2.737 (6) 2.923 (5)	2HU, England. <b>References</b> Cromer, D. T. & Wal ray Crystallography, Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si <b>6</b> , 758–760. Dronskowski, R., Simu Chem. <b>602</b> , 49–63. Enraf–Nonius (1989). Delft, The Netherlan Fair, C. K. (1990). M Crystal Structure An Gall, P. (1993). Thesis Gall, P., Gougeon, P Gall, P., Toupet, L. & 1584	ber, J. T. (1 <sup>4</sup> , Vol. IV, Tal sent distribut mon, A. (19 <sup>4</sup> on, A. & M <i>CAD-4 Soft</i> dol. <i>AolEN. An I</i> <i>alysis.</i> Enraf , University ( 2. (1994). Act Gougeon, P	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin, W. (1991). 2 ware. Version 5.0. interactive Intellige -Nonius, Delft, The of Rennes, France. a Cryst. C <b>50</b> , 7–9. . (1993). Acta Cry.	Tables for X- Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius, ent System for Netherlands. St. C49, 1580-
$\begin{array}{l} Mo(23) &= Mo(25) \\ Mo(23) &= Mo(25) \\ Mo(23) &= Mo(24) \\ Mo(24) &= Mo(26) \\ Mo(24) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(25) &= Mo(26) \\ Mo(22) &= O(34) \\ Mo(22) &= O(44) \\ Mo(22) &= O(44) \\ Mo(22) &= O(44) \\ Mo(23) &= O(23) \\ \begin{array}{l} \mathbf{Sr}(1) &= O(24) \\ Sr(1) &= O(44) \\ \mathbf{Sr}(1) &= O(41) \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.7423 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.7400 (9) 2.7400 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.130 (6) 2.130 (6) 2.123 (6) 2.566 (6) 2.579 (6) 2.776 (6) 2.824 (6) 2.834 (6) 2.844 (6) 2.844 (6) 2.844 (6)	$\begin{array}{c} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(45) \\ Mo(25) - O(16) \\ Mo(25) - O(34) \\ Mo(25) - O(16) \\ Mo(25) - O(23) \\ Mo(26) - O(48) \\ Mo(26) - O(13) \\ Sr(3) - O(13) \\ Sr(3) - O(13) \\ Sr(3) - O(13) \\ Sr(3) - O(11) \\ Sr(3) - O(12) \\ Sr(3) - O(12) \\ Sr(3) - O(13) \\ Sr(3) - O(13) \\ Sr(3) - O(11) \\ Sr(3) - O(11) \\ Sr(3) - O(12) \\ Sr(3) - O(12) \\ Sr(3) - O(12) \\ Sr(3) - O(12) \\ Sr(3) - O(13) \\ Sr(3) - O(12) \\ Sr(3) - O(12) \\ Sr(3) - O(12) \\ Sr(3) - O(12) \\ Sr(3) - O(13) \\ Sr(3) - O(12) \\ Sr(3) - O(13) \\ Sr(3) $	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.054 (6) 2.054 (6) 2.098 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.028 (6) 2.031 (6) 2.060 (6) 2.640 (6) 2.641 (5) 2.732 (6) 2.735	2HU, England. <b>References</b> Cromer, D. T. & Wal ray Crystallography, Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si <b>6</b> , 758–760. Dronskowski, R., Simu Chem. <b>602</b> , 49–63. Enraf–Nonius (1989). Delft, The Netherlan Fair, C. K. (1990). M Crystal Structure An Gall, P. (1993). Thesis Gall, P., Toupet, L. & 1584. Gougeon P. (1993). III	ber, J. T. (1 <sup>4</sup> , Vol. IV, Tal sent distribut mon, A. (19) on, A. & M <i>CAD-4 Soft</i> dots. <i>AolEN. An I</i> <i>alysis.</i> Enraf , University ( . (1994). <i>Act</i> Gougeon, P	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin, W. (1991). 2 ware. Version 5.0. Interactive Intellige -Nonius, Delft, The of Rennes, France. a Cryst. C <b>S0</b> , 7–9. . (1993). Acta Crys	Tables for X- Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius, ont System for Netherlands. St. C49, 1580-
$\begin{array}{l} Mo(2.5) &= Mo(2.6) \\ Mo(2.3) &= Mo(2.5) \\ Mo(2.3) &= Mo(2.4) \\ Mo(2.4) &= Mo(2.6) \\ Mo(2.4) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.2) &= O(3.4) \\ Mo(2.2) &= O(3.4) \\ Mo(2.2) &= O(4.4) \\ Mo(2.3) &= O(2.3) \\ \begin{array}{c} Sr \text{-} atom environments \\ Sr(1) &= O(4.4) \\ Sr(1) &= O(4.4) \\ Sr(1) &= O(4.4) \\ Sr(1) &= O(4.9) \\ Sr(1) &= O(4.9) \\ Sr(1) &= O(4.9) \\ Sr(1) &= O(4.8) \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.7789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.130 (6) 2.130 (6) 2.130 (6) 2.513 (6) 2.556 (6) 2.556 (6) 2.5792 (5) 2.776 (6) 2.834 (6) 2.834 (6) 2.834 (6) 2.866 (6) 2.941 (6)	$\begin{array}{c} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(15) \\ Mo(25) - O(34) \\ Mo(25) - O(34) \\ Mo(25) - O(16) \\ Mo(25) - O(16) \\ Mo(25) - O(48) \\ Mo(26) - O(13) \\ Sr(3) - O(19) \\ Sr(3) - O(13) \\ Sr(3) - O(13) \\ Sr(3) - O(11) \\ Sr(3) - O(32) \\ Sr(3) - O(32) \\ \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.016 (6) 2.054 (6) 2.054 (6) 2.098 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.028 (6) 2.060 (6) 2.060 (6) 2.641 (5) 2.732 (6) 2.735 (6) 2.735 (6) 2.737 (6) 2.930 (6) 2.930 (6) 2.955 (6)	2HU, England. <b>References</b> Cromer, D. T. & Wal ray Crystallography, Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si <b>6</b> , 758–760. Dronskowski, R., Simu Chem. <b>602</b> , 49–63. Enraf–Nonius (1989). Delft, The Netherlan Fair, C. K. (1990). M Crystal Structure An Gall, P. (1993). Thesis Gall, P., Toupet, L. & 1584. Gougeon, P. (1993). Ui Gougeon, P. & McCarl	ber, J. T. (19 , Vol. IV, Tal sent distribut mon, A. (199 on, A. & M <i>CAD-4 Soft</i> dol. <i>AolEN. An I</i> <i>alysis.</i> Enraf , University of C (1994). Act Gougeon, P npublished re	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin, W. (1991). 2 ware. Version 5.0. Interactive Intellige -Nonius, Delft, The of Rennes, France. a Cryst. C <b>50</b> , 7–9. . (1993). Acta Cryst. Sults.	Tables for X- Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius, ent System for e Netherlands. st. C49, 1580- 47 241-244
$\begin{array}{l} Mo(2.5) &= Mo(2.6) \\ Mo(2.3) &= Mo(2.5) \\ Mo(2.3) &= Mo(2.4) \\ Mo(2.4) &= Mo(2.6) \\ Mo(2.4) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.2) &= O(3.4) \\ Mo(2.2) &= O(3.4) \\ Mo(2.2) &= O(4.4) \\ Mo(2.3) &= O(2.3) \\ \mathbf{Sr} = \mathbf{tom} \ environments \\ \mathbf{Sr}(1) &= O(4.4) \\ \mathbf{Sr}(1) &= O(4.6) \\ \mathbf{Sr}(1) &= $	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.7423 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.7789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.130 (6) 1.930 (6) 2.130 (6) 2.513 (6) 2.556 (6) 2.592 (5) 2.776 (6) 2.834 (6) 2.834 (6) 2.834 (6) 2.834 (6) 2.846 (6) 2.941 (6) 2.955 (6)	$\begin{array}{c} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(15) \\ Mo(25) - O(34) \\ Mo(25) - O(34) \\ Mo(25) - O(33) \\ Mo(25) - O(48) \\ Mo(26) - O(6) \\ Mo(26) - O(48) \\ Mo(26) - O(48) \\ Mo(26) - O(48) \\ Mo(26) - O(13) \\ Sr(3) - O(12) \\ Sr(3) - O(13) \\ Sr(3) - O(22) \\ Sr(3) - O($	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.016 (6) 2.054 (6) 2.054 (6) 2.098 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.028 (6) 2.060 (6) 2.060 (6) 2.641 (5) 2.732 (6) 2.735 (6) 2.735 (6) 2.735 (6) 2.930 (6) 2.930 (6) 2.955 (6) 3.099 (6)	2HU, England. References Cromer, D. T. & Wal ray Crystallography, Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si 6, 758–760. Dronskowski, R., Simu Chem. 602, 49–63. Enraf–Nonius (1989). Delft, The Netherlan Fair, C. K. (1990). M Crystal Structure An Gall, P. (1993). Thesis Gall, P., Toupet, L. & 1584. Gougeon, P. MacCar Gougeon, P. MacCar Gougeon, P. MacCar	ber, J. T. (19 , Vol. IV, Tal sent distribut mon, A. (199 on, A. & M <i>CAD-4 Soft</i> dol. <i>AolEN. An I</i> <i>alysis.</i> Enraf , University of C. (1994). Act Gougeon, P npublished re & Sereet	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin, W. (1991). 2 vare. Version 5.0. Interactive Intellige -Nonius, Delft, The of Rennes, France. a Cryst. C <b>50</b> , 7–9. . (1993). Acta Cryst. 991). Acta Cryst. C (1990). Acta Cryst. C	Tables for X- Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius, ent System for e Netherlands. st. C49, 1580- 47, 241-244. st. C46, 1188-
$\begin{array}{l} Mo(2.5) &= Mo(2.6) \\ Mo(2.3) &= Mo(2.5) \\ Mo(2.3) &= Mo(2.4) \\ Mo(2.4) &= Mo(2.6) \\ Mo(2.4) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.2) &= O(3.4) \\ Mo(2.2) &= O(4.4) \\ Mo(2.3) &= O(2.3) \\ Sr(1) &= O(4.4) \\ Sr(1) &= O(4.7) \\ Sr(1) &= O(4.7) \\ Sr(1) &= O(4.1) \\ Sr(1) &= O(2.7) \\ Sr(1) &= O(2.7) \\ Sr(1) &= O(3.6) \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7136 (9) 2.7136 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.038 (6) 2.038 (6) 2.114 (6) 2.133 (6) 2.130 (6) 2.513 (6) 2.566 (6) 2.592 (5) 2.706 (6) 2.759 (6) 2.759 (6) 2.824 (6) 2.834 (6) 2.834 (6) 2.834 (6) 2.834 (6) 2.955 (6) 3.000 (6)	$\begin{array}{c} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(24) - O(15) \\ Mo(25) - O(34) \\ Mo(25) - O(34) \\ Mo(25) - O(34) \\ Mo(25) - O(16) \\ Mo(25) - O(16) \\ Mo(25) - O(16) \\ Mo(26) - O(48) \\ Mo(26) - O(48) \\ Mo(26) - O(48) \\ Mo(26) - O(48) \\ Mo(26) - O(3) \\ \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.016 (6) 2.054 (6) 2.054 (6) 2.094 (6) 2.094 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.058 (6) 2.060 (6) 2.641 (5) 2.732 (6) 2.735 (6) 2.735 (6) 2.735 (6) 2.930 (6) 2.930 (6) 2.940 (6) 2.940 (6) 2.940 (6) 2.955 (6) 3.099 (6) 3.105 (5)	2HU, England. References Cromer, D. T. & Wal ray Crystallography, Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si 6, 758–760. Dronskowski, R., Simu <i>Chem.</i> 602, 49–63. Enraf–Nonius (1989). Delft, The Netherlan Fair, C. K. (1990). M Crystal Structure An Gall, P. (1993). Thesis Gall, P., Toupet, L. & 1584. Gougeon, P. (1993). Ui Gougeon, P. & McCari Gougeon, P., Potel, M. 1190	ber, J. T. (19 , Vol. IV, Tal sent distribut mon, A. (19) on, A. & M <i>CAD-4 Sofn</i> dds. <i>AolEN. An I</i> <i>alysis.</i> Enraf , University (1994). <i>Act</i> Gougeon, P npublished re ley, R. E. (19 & Sergent, N	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin, W. (1991). 2 vare. Version 5.0. Interactive Intellige -Nonius, Delft, The of Rennes, France. a Cryst. C <b>50</b> , 7–9. . (1993). Acta Cryst. esults. 991). Acta Cryst. C A. (1990). Acta Cryst. C	Tables for X- Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius, ent System for e Netherlands. st. C49, 1580- 47, 241-244. st. C46, 1188-
$\begin{array}{l} Mo(2.5) &= Mo(2.6) \\ Mo(2.3) &= Mo(2.5) \\ Mo(2.3) &= Mo(2.4) \\ Mo(2.4) &= Mo(2.6) \\ Mo(2.4) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.5) &= Mo(2.6) \\ Mo(2.2) &= O(4.6) \\ Mo(2.6) \\ M$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.8478 (9) 2.8478 (9) 2.7072 (9) 2.7136 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.114 (6) 2.133 (6) 2.130 (6) 1.930 (6) 2.513 (6) 2.513 (6) 2.592 (5) 2.706 (6) 2.579 (6) 2.824 (6) 2.834 (6) 2.834 (6) 2.834 (6) 2.834 (6) 2.941 (6) 2.955 (6) 3.000 (6) 2.495 (6)	$\begin{array}{c} Mo(24)O(47) \\ Mo(24)O(48) \\ Mo(24)O(45) \\ Mo(24)O(15) \\ Mo(24)O(15) \\ Mo(25)O(34) \\ Mo(25)O(34) \\ Mo(25)O(16) \\ Mo(25)O(16) \\ Mo(25)O(16) \\ Mo(26)O(48) \\ Mo(26)O(48) \\ Mo(26)O(48) \\ Mo(26)O(48) \\ Mo(26)O(3) \\ \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.016 (6) 2.054 (6) 2.054 (6) 2.094 (6) 2.094 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.031 (6) 2.058 (6) 2.060 (6) 2.640 (6) 2.641 (5) 2.732 (6) 2.732 (6) 2.735 (6) 2.735 (6) 2.930 (6) 2.930 (6) 2.940 (6) 2.955 (6) 3.099 (6) 3.105 (5) 2.557 (5)	<ul> <li>2HU, England.</li> <li><b>References</b></li> <li>Cromer, D. T. &amp; Walt ray Crystallography, Kynoch Press. (Pres Dordrecht.)</li> <li>Dronskowski, R. &amp; Si 6, 758–760.</li> <li>Dronskowski, R., Sime Chem. 602, 49–63.</li> <li>Enraf–Nonius (1989).</li> <li>Delft, The Netherlan</li> <li>Fair, C. K. (1990). M Crystal Structure An Gall, P. (1993). Thesis Gall, P. &amp; Gougeon, P. Gall, P., Toupet, L. &amp; 1584.</li> <li>Gougeon, P. (1993). Ut Gougeon, P. &amp; McCarl Gougeon, P., Potel, M. 1190.</li> </ul>	ber, J. T. (1) , Vol. IV, Tal sent distribut mon, A. (19) on, A. & M <i>CAD-4 Soft</i> dole. An <i>I</i> <i>calysis</i> . Enraf , University of (1994). Act Gougeon, P npublished re ley, R. E. (15 & Sergent, M n A K Bo	974). International ble 2.2A, pp. 72–98 or Kluwer Acader 89). Angew. Chem. ertin, W. (1991). 2 vare. Version 5.0. Interactive Intellige -Nonius, Delft, The of Rennes, France. a Cryst. C <b>50</b> , 7–9. . (1993). Acta Cryst. 991). Acta Cryst. C 4. (1990). Acta Cryst. 991. Acta Cryst. C	Tables for X- . Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius, ent System for e Netherlands. st. C49, 1580- 47, 241-244. st. C46, 1188- erley H R &
$\begin{array}{l} \text{MO}(2.5) &= \text{MO}(2.6) \\ \text{MO}(2.3) &= \text{MO}(2.5) \\ \text{MO}(2.3) &= \text{MO}(2.5) \\ \text{MO}(2.4) &= \text{MO}(2.6) \\ \text{MO}(2.5) &= \text{MO}(2.6) \\ \text{MO}(2.5) &= \text{MO}(2.6) \\ \text{MO}(2.5) &= \text{MO}(2.6) \\ \text{MO}(2.5) &= \text{MO}(2.6) \\ \text{MO}(2.2) &= \text{O}(4.4) \\ \text{MO}(2.2) &= \text{O}(4.6) \\ \text{Sr}(1) &= \text{O}(1.6) \\ \text{Sr}(1) &= \text{O}(2.5) \\ \text{Sr}(2) &= \text{O}(2.5) \\ \text{Sr}(2) &= \text{O}(2.6) \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7072 (9) 2.7136 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.114 (6) 2.130 (6) 1.930 (6) 2.513 (6) 2.513 (6) 2.592 (5) 2.776 (6) 2.884 (6) 2.884 (6) 2.884 (6) 2.884 (6) 2.941 (6) 2.945 (6) 2.495 (6) 2.548 (6)	$\begin{array}{l} Mo(24)O(47) \\ Mo(24)O(48) \\ Mo(24)O(45) \\ Mo(24)O(15) \\ Mo(24)O(15) \\ Mo(25)O(16) \\ Mo(25)O(16) \\ Mo(25)O(16) \\ Mo(25)O(16) \\ Mo(26)O(48) \\ Mo(26)O(48) \\ Mo(26)O(48) \\ Mo(26)O(48) \\ Mo(26)O(42) \\ Sr(3)O(21) \\ Sr(3)O(12) \\ Sr(3)O(12) \\ Sr(4)O(21) \\ \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.016 (6) 2.054 (6) 2.054 (6) 2.094 (6) 2.094 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.031 (6) 2.058 (6) 2.060 (6) 2.640 (6) 2.641 (5) 2.732 (6) 2.732 (6) 2.735 (6) 2.735 (6) 2.930 (6) 2.930 (6) 2.940 (6) 2.955 (6) 3.099 (6) 3.105 (5) 2.557 (5) 2.589 (5)	<ul> <li>2HU, England.</li> <li><b>References</b></li> <li>Cromer, D. T. &amp; Walt ray Crystallography, Kynoch Press. (Pres Dordrecht.)</li> <li>Dronskowski, R. &amp; Si 6, 758–760.</li> <li>Dronskowski, R., Sime Chem. 602, 49–63.</li> <li>Enraf–Nonius (1989).</li> <li>Delft, The Netherlan</li> <li>Fair, C. K. (1990). M Crystal Structure An Gall, P. (1993). Thesis Gall, P. &amp; Gougeon, P. Gall, P., Toupet, L. &amp; 1584.</li> <li>Gougeon, P. &amp; McCari Gougeon, P., Potel, M. 1190.</li> <li>Hibble, S. J., Cheethar Cox, D. F. (1988).</li> </ul>	ber, J. T. (1 <sup>4</sup> , Vol. IV, Tal sent distribut mon, A. (19) on, A. & M <i>CAD-4 Soft</i> dolEN. An <i>I</i> <i>calysis</i> . Enraf <i>calysis</i> . Enraf <i>c</i> (1994). <i>Act</i> Gougeon, P npublished re ley, R. E. (19 & Sergent, N m, A. K., Bo	<ul> <li>974). International ble 2.2A, pp. 72–98 or Kluwer Acader</li> <li>89). Angew. Chem.</li> <li>ertin, W. (1991). 2</li> <li>vare. Version 5.0.</li> <li>interactive Intellige-Nonius, Delft, The of Rennes, France.</li> <li>a Cryst. C50, 7–9.</li> <li>(1993). Acta Cryst.</li> <li>vesults.</li> <li>191). Acta Cryst. C4. (1990). Acta Cryst.</li> <li>gle, A. R. L., Wak Soc. 110, 3295-32</li> </ul>	Tables for X- Birmingham: nic Publishers, Int. Ed. Engl. Anorg. Allg. Enraf-Nonius, ent System for Netherlands. St. C49, 1580- 47, 241-244. St. C46, 1188- erley, H. R. & 96
$\begin{array}{l} \text{MO(23)} &\text{MO(26)} \\ \text{MO(23)} &\text{MO(25)} \\ \text{MO(23)} &\text{MO(24)} \\ \text{MO(24)} &\text{MO(26)} \\ \text{MO(24)} &\text{MO(26)} \\ \text{MO(25)} &\text{MO(26)} \\ \text{MO(25)} &\text{MO(26)} \\ \text{MO(25)} &\text{MO(26)} \\ \text{MO(22)} &\text{O(34)} \\ \text{MO(22)} &\text{O(44)} \\ \text{MO(22)} &\text{O(44)} \\ \text{MO(22)} &\text{O(44)} \\ \text{MO(22)} &\text{O(43)} \\ \text{MO(23)} &\text{O(23)} \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7173 (9) 2.7136 (9) 2.7400 (9) 2.7400 (9) 2.7490 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.114 (6) 2.113 (6) 2.123 (6) 2.123 (6) 2.130 (6) 1.930 (6) 2.513 (6) 2.592 (5) 2.776 (6) 2.824 (6) 2.834 (6) 2.834 (6) 2.848 (6) 2.955 (6) 3.000 (6) 2.958 (6) 2.578 (6) 2.578 (6)	$\begin{array}{c} Mo(24)O(47) \\ Mo(24)O(48) \\ Mo(24)O(45) \\ Mo(24)O(15) \\ Mo(24)O(15) \\ Mo(25)O(47) \\ Mo(25)O(47) \\ Mo(25)O(16) \\ Mo(25)O(16) \\ Mo(25)O(48) \\ Mo(26)O(48) \\ Mo(26)O(48) \\ Mo(26)O(48) \\ Mo(26)O(48) \\ Mo(26)O(41) \\ Sr(3)O(21) \\ Sr(3)O(21) \\ Sr(3)O(12) \\ Sr(3)O(13) \\ Sr(3)O(13) \\ Sr(3)O(13) \\ Sr(3)O(13) \\ Sr(3)O(13) \\ Sr(3)O(13) \\ Sr(3)O(12) \\ Sr(3)O(29) \\ Sr(3)O(21) \\ Sr(4)O(21) \\ Sr(4)$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.054 (6) 2.054 (6) 2.054 (6) 2.098 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.031 (6) 2.058 (6) 2.060 (6) 2.640 (6) 2.641 (5) 2.735 (6) 2.735 (6) 2.735 (6) 2.735 (6) 2.735 (6) 2.923 (5) 2.930 (6) 2.940 (6) 2.955 (6) 3.099 (6) 3.105 (5) 2.557 (5) 2.589 (5) 2.602 (6)	2HU, England. <b>References</b> Cromer, D. T. & Wal ray Crystallography, Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si <b>6</b> , 758–760. Dronskowski, R., Simu Chem. <b>602</b> , 49–63. Enraf–Nonius (1989). Delft, The Netherlan Fair, C. K. (1990). M Crystal Structure An Gall, P. (1993). Thesis Gall, P., Toupet, L. & 1584. Gougeon, P. (1993). Ui Gougeon, P. & McCarl Gougeon, P., Potel, M. 1190. Hibble, S. J., Cheethar Cox, D. E. (1988). J Johnson, C. K. (1976).	ber, J. T. (1 <sup>4</sup> , Vol. IV, Tal sent distribut mon, A. (19 <sup>4</sup> on, A. & M <i>CAD-4 Soft</i> dol <i>EN. An I</i> <i>calysis.</i> Enraf , University of Calgeon, P npublished re ley, R. E. (19 & Sergent, N m, A. K., Bo <i>C. Am. Chem.</i>	<ul> <li>974). International ble 2.2A, pp. 72–98 or Kluwer Acader</li> <li>89). Angew. Chem.</li> <li>ertin, W. (1991). 2</li> <li>vare. Version 5.0.</li> <li>nteractive Intellige</li> <li>Nonius, Delft, Theorem of Rennes, France.</li> <li>a Cryst. C50, 7–9.</li> <li>(1993). Acta Cryst.</li> <li>cults.</li> <li>991). Acta Cryst. CA. (1990). Acta Cryst</li> <li>gle, A. R. L., Wak Soc. 110, 3295–32</li> <li>Report ORNI 5.13</li> </ul>	Tables for X- Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius, ent System for Netherlands. St. C49, 1580- 47, 241-244. ISL C46, 1188- erley, H. R. & 96. 8. Oak Ridge
$\begin{array}{l} \text{MO(23)} &\text{MO(26)} \\ \text{MO(23)} &\text{MO(25)} \\ \text{MO(23)} &\text{MO(24)} \\ \text{MO(24)} &\text{MO(26)} \\ \text{MO(24)} &\text{MO(26)} \\ \text{MO(25)} &\text{MO(26)} \\ \text{MO(25)} &\text{MO(26)} \\ \text{MO(26)} &\text{MO(26)} \\ \text{MO(22)} &\text{O(44)} \\ \text{MO(22)} &\text{O(44)} \\ \text{MO(22)} &\text{O(44)} \\ \text{MO(22)} &\text{O(44)} \\ \text{MO(23)} &\text{O(23)} \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.8478 (9) 2.5963 (9) 2.7107 (9) 2.7136 (9) 2.7400 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.113 (6) 2.123 (6) 2.123 (6) 2.123 (6) 2.123 (6) 2.130 (6) 1.930 (6) 2.559 (5) 2.759 (6) 2.759 (6) 2.824 (6) 2.834 (6) 2.834 (6) 2.848 (6) 2.955 (6) 3.000 (6) 2.558 (6) 2.558 (6) 2.558 (6) 2.578 (6) 2.578 (6) 2.701 (6)	$\begin{array}{l} Mo(24) - O(47) \\ Mo(24) - O(48) \\ Mo(24) - O(45) \\ Mo(24) - O(45) \\ Mo(24) - O(15) \\ Mo(25) - O(16) \\ Mo(25) - O(23) \\ Mo(25) - O(16) \\ Mo(25) - O(23) \\ Mo(25) - O(48) \\ Mo(26) - O(41) \\ Sr(3) - O(21) \\ Sr(3) - O(21) \\ Sr(3) - O(12) \\ Sr(3) - O(13) \\ Sr(3) - O(12) \\ Sr(3) - O(22) \\ Sr(3) - O(22) \\ Sr(3) - O(22) \\ Sr(3) - O(21) \\ Sr(4) - O(33) \\ Sr(4) - O(21) \\ Sr(4) - O(34) \\ Sr(4) - O(34) \\ Sr(4) - O(34) \\ Sr(4) - O(45) \\ Sr(4) - O(45) \\ Sr(4) - O(46) \\ \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.116 (6) 2.054 (6) 2.054 (6) 2.094 (6) 2.098 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.031 (6) 2.058 (6) 2.058 (6) 2.060 (6) 2.735 (6) 2.735 (6) 2.735 (6) 2.735 (6) 2.735 (6) 2.930 (6) 2.955 (6) 3.099 (6) 3.105 (5) 2.589 (5) 2.589 (5) 2.589 (5) 2.602 (6) 2.688 (6)	2HU, England. <b>References</b> Cromer, D. 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$\begin{array}{l} \text{MO(23)} &\text{MO(26)} \\ \text{MO(23)} &\text{MO(25)} \\ \text{MO(23)} &\text{MO(24)} \\ \text{MO(24)} &\text{MO(26)} \\ \text{MO(24)} &\text{MO(26)} \\ \text{MO(25)} &\text{MO(26)} \\ \text{MO(25)} &\text{MO(26)} \\ \text{MO(26)} &\text{MO(26)} \\ \text{MO(22)} &\text{O(44)} \\ \text{MO(22)} &\text{O(44)} \\ \text{MO(22)} &\text{O(44)} \\ \text{MO(22)} &\text{O(44)} \\ \text{MO(23)} &\text{O(23)} \\ \end{array}$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.7423 (9) 2.8478 (9) 2.7072 (9) 2.7136 (9) 2.7400 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.114 (6) 2.123 (6) 2.130 (6) 1.930 (6) 2.513 (6) 2.566 (6) 2.579 (6) 2.759 (6) 2.759 (6) 2.776 (6) 2.834 (6) 2.844 (6) 2.844 (6) 2.941 (6) 2.941 (6) 2.945 (6) 2.548 (6) 2.548 (6) 2.548 (6) 2.548 (6) 2.578 (6) 2.776 (6) 2.776 (6) 2.776 (6) 2.776 (6) 2.776 (6) 2.776 (6) 2.776 (6) 2.777 (6)	$\begin{array}{l} Mo(24)O(47) \\ Mo(24)O(48) \\ Mo(24)O(45) \\ Mo(24)O(45) \\ Mo(24)O(45) \\ Mo(25)O(47) \\ Mo(25)O(47) \\ Mo(25)O(16) \\ Mo(25)O(23) \\ Mo(26)O(48) \\ Mo(26)O(48) \\ Mo(26)O(47) \\ Mo(26)O(48) \\ Mo(26)O(3) \\ \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.016 (6) 2.054 (6) 2.054 (6) 2.094 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.031 (6) 2.028 (6) 2.031 (6) 2.060 (6) 2.640 (6) 2.641 (5) 2.709 (5) 2.732 (6) 2.737 (6) 2.923 (5) 2.930 (6) 2.955 (6) 3.099 (6) 3.105 (5) 2.589 (5) 2.602 (6) 2.658 (6) 2.717 (6) 2.717 (6) 2.727 (6)	2HU, England. <b>References</b> Cromer, D. T. & Wal ray Crystallography, Kynoch Press. (Pres Dordrecht.) Dronskowski, R. & Si <b>6</b> , 758–760. Dronskowski, R., Simu Chem. <b>602</b> , 49–63. Enraf–Nonius (1989). Delft, The Netherlan Fair, C. K. (1990). M Crystal Structure An Gall, P. (1993). Thesis Gall, P., Toupet, L. & 1584. Gougeon, P. (1993). Uf Gougeon, P., A McCarl Gougeon, P., Potel, M. 1190. Hibble, S. J., Cheethar Cox, D. E. (1988). J Johnson, C. K. (1976) National Laboratory, Kerihuel G. & Gougee	ber, J. T. (1 <sup>4</sup> , Vol. IV, Tal sent distribut mon, A. (19) on, A. & M <i>CAD-4 Soft</i> dol. <i>AolEN. An I</i> <i>alysis.</i> Enraf , University ( 2. (1994). Act Gougeon, P npublished re ley, R. E. (19 & Sergent, M n, A. K., Bo <i>J. Am. Chem.</i> ). <i>ORTEPI</i> 1. Tennessee, 1 0, P. (1995/	<ul> <li>974). International ble 2.2A, pp. 72–98 or Kluwer Acader</li> <li>89). Angew. Chem.</li> <li>ertin, W. (1991). 2</li> <li>ware. Version 5.0.</li> <li>interactive Intellige</li> <li>Nonius, Delft, Theorem of Rennes, France.</li> <li>a Cryst. C50, 7–9.</li> <li>(1993). Acta Cryst.</li> <li>csults.</li> <li>D91). Acta Cryst. C4. (1990). Acta Cryst</li> <li>gle, A. R. L., Wak Soc. 110, 3295–32</li> <li>Report ORNL-513: USA.</li> <li>U. Acta Cryst. C51</li> </ul>	Tables for X- Birmingham: nic Publishers, Int. Ed. Engl. Z. Anorg. Allg. Enraf-Nonius, mt System for e Netherlands. st. C49, 1580- 47, 241-244. st. C46, 1188- erley, H. R. & 96. 18. Oak Ridge 787-790
$\begin{array}{l} \text{Mo}(23) &\text{Mo}(26) \\ \text{Mo}(23) &\text{Mo}(25) \\ \text{Mo}(23) &\text{Mo}(24) \\ \text{Mo}(24) &\text{Mo}(26) \\ \text{Mo}(24) &\text{Mo}(26) \\ \text{Mo}(25) &\text{Mo}(26) \\ \text{Mo}(25) &\text{Mo}(26) \\ \text{Mo}(25) &\text{Mo}(26) \\ \text{Mo}(22) &\text{O}(34) \\ \text{Mo}(22) &\text{O}(4) \\ \text{Mo}(22) &\text{O}(44) \\ \text{Mo}(22) &\text{O}(44) \\ \text{Mo}(22) &\text{O}(44) \\ \text{Mo}(23) &\text{O}(23) \\ \hline \text{Sr-atom environments} \\ \frac{\text{Sr}(1) &\text{O}(24) \\ \text{Sr}(1) &\text{O}(24) \\ \text{Sr}(1) &\text{O}(24) \\ \text{Sr}(1) &\text{O}(14) \\ \text{Sr}(2) &\text{O}(25) \\ \text{Sr}(2) &\text{O}(25) \\ \text{Sr}(2) &\text{O}(24) \\ \text{Sr}(2) &\text{O}(25) \\ \text{Sr}(2) &\text{O}(24) \\ \text{Sr}(2) &\text{O}(25) \\ \text{Sr}(2) &\text{O}(24) \\ \text{Sr}(2) &\text{O}(25) \\ \text{Sr}(2) &\text{O}(25$	2.7399 (9) 2.7423 (9) 2.7423 (9) 2.7423 (9) 2.7426 (9) 2.7072 (9) 2.7136 (9) 2.7400 (9) 2.7400 (9) 2.789 (1) 2.838 (1) 2.037 (6) 2.038 (6) 2.114 (6) 2.123 (6) 2.130 (6) 1.930 (6) 2.513 (6) 2.566 (6) 2.579 (6) 2.776 (6) 2.834 (6) 2.834 (6) 2.844 (6) 2.844 (6) 2.846 (6) 2.941 (6) 2.955 (6) 3.000 (6) 2.495 (6) 2.558 (6) 2.558 (6) 2.578 (6) 2.578 (6) 2.776 (6) 2.776 (6) 2.776 (6) 2.776 (6) 2.776 (6) 2.778 (6) 2.778 (6) 2.778 (6) 2.778 (6)	$\begin{array}{c} Mo(24)O(47) \\ Mo(24)O(48) \\ Mo(24)O(45) \\ Mo(24)O(15) \\ Mo(24)O(15) \\ Mo(25)O(16) \\ Mo(25)O(23) \\ Mo(25)O(16) \\ Mo(25)O(23) \\ Mo(26)O(48) \\ Mo(26)O(48) \\ Mo(26)O(48) \\ Mo(26)O(48) \\ Mo(26)O(13) \\ Sr(3)O(12) \\ Sr(3)O(12) \\ Sr(3)O(13) \\ Sr(3)O(12) \\ Sr(4)O(21) \\ Sr(4)O(21) \\ Sr(4)O(21) \\ Sr(4)O(21) \\ Sr(4)O(24) \\ Sr(4)O(24) \\ Sr(4)O(24) \\ Sr(4)O(24) \\ Sr(4)O(28) \\ \end{array}$	2.026 (6) 2.049 (6) 2.079 (6) 2.083 (6) 2.016 (6) 2.054 (6) 2.054 (6) 2.098 (6) 2.098 (6) 2.028 (6) 2.028 (6) 2.031 (6) 2.031 (6) 2.058 (6) 2.060 (6) 2.641 (5) 2.709 (5) 2.732 (6) 2.735 (6) 2.735 (6) 2.930 (6) 2.930 (6) 3.099 (6) 3.105 (5) 2.589 (5) 2.602 (6) 2.658 (6) 2.717 (6) 2.737 (6) 2.588 (5) 2.602 (6) 2.658 (6) 2.717 (6) 2.774 (6) 2.775 (6)	<ul> <li>2HU, England.</li> <li><b>References</b></li> <li>Cromer, D. T. &amp; Wal ray Crystallography, Kynoch Press. (Pres Dordrecht.)</li> <li>Dronskowski, R. &amp; Si 6, 758–760.</li> <li>Dronskowski, R., Simu Chem. 602, 49–63.</li> <li>Enraf–Nonius (1989).</li> <li>Delft, The Netherlan Fair, C. K. (1990). M Crystal Structure An Gall, P. (1993). Thesis Gall, P. &amp; Gougeon, P. Gall, P., Toupet, L. &amp; 1584.</li> <li>Gougeon, P. (1993). Ut Gougeon, P. McCarl Gougeon, P., Potel, M. 1190.</li> <li>Hibble, S. J., Cheetharl Cox, D. E. (1988). J Johnson, C. K. (1976).</li> <li>National Laboratory, Kerihuel, G. &amp; Gougeor</li> </ul>	ber, J. T. (1 <sup>4</sup> , Vol. IV, Tal sent distribut mon, A. (19) on, A. & M <i>CAD-4 Soft</i> dol. <i>AolEN. An I</i> <i>alysis.</i> Enraf , University ( 2. (1994). Act Gougeon, P npublished re ley, R. E. (19 & Sergent, M m, A. K., Bo <i>J. Am. Chem.</i> ). <i>ORTEP</i> 11. Tennessee, 1 Tennessee, 1 (1995a on, P. (1995a	<ul> <li>974). International ble 2.2A, pp. 72–98 or Kluwer Acader</li> <li>89). Angew. Chem.</li> <li>ertin, W. (1991). 2</li> <li>ware. Version 5.0.</li> <li>interactive Intellige</li> <li>Nonius, Delft, Theorem of Rennes, France.</li> <li>a Cryst. C50, 7–9.</li> <li>(1993). Acta Cryst. C51, 1990). Acta Cryst. C72</li> <li>gle, A. R. L., Wak Soc. 110, 3295–32</li> <li>Report ORNL-513</li> <li>USA.</li> <li>Acta Cryst. C51, 0.</li> <li>Acta Cryst. C51, 0.</li> </ul>	Tables for X-         Birmingham:         nic Publishers,         Int. Ed. Engl.         Z. Anorg. Allg.         Enraf–Nonius,         mt System for         e Netherlands.         st. C49, 1580–         47, 241–244.         st. C46, 1188–         erley, H. R. &         96.         18. Oak Ridge         , 787–790.         1475–1478.

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## Lithium Dicobalt Tripolyphosphate and Lithium Dinickel Tripolyphosphate

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#### Abstract

Isotypic lithium dicobalt triphosphate,  $LiCo_2P_3O_{10}$ , and lithium dinickel triphosphate,  $LiNi_2P_3O_{10}$ , have been synthesized and characterized by single-crystal X-ray diffraction. These are the first observations of nonhydrated mixed-metal tripolyphosphates. The  $P_3O_{10}^{5-}$ groups are situated on a mirror plane, with successive  $PO_3$  moieties displaying both staggered and eclipsed conformations. Octahedrally coordinated  $Co^{2+}$  and  $Ni^{2+}$ ions form a staggered chain  $[Co\cdots Co \ 3.286(1) \ and 3.133(1) \ \text{Å}, Ni\cdots Ni \ 3.201(1) \ and \ 3.023(1) \ \text{Å}]$ , with successive metal ions bridged by two O atoms.

#### Comment

The literature contains numerous structural studies of solid materials containing the  $P_3O_{10}^{5-}$  group. Most, however, are hydrated systems in which hydrogen-bonding

interactions play a role in determining the packing, for example, Zn<sub>5</sub>(P<sub>3</sub>O<sub>10</sub>)<sub>2</sub>.17H<sub>2</sub>O (Averbuch-Pouchot & Durif, 1975; Averbuch-Pouchot, Durif & Guitel, 1975), Na<sub>5</sub>P<sub>3</sub>O<sub>10</sub>.6H<sub>2</sub>O (Dyroff, 1965), CuNa<sub>3</sub>P<sub>3</sub>O<sub>10</sub>.12H<sub>2</sub>O (Jouini, Dabbabi, Averbuch-Pouchot, Durif & Guitel, 1984), NaZn<sub>2</sub>P<sub>3</sub>O<sub>10</sub>.9H<sub>2</sub>O (powder data; Corbridge & Tromans, 1958) and Na<sub>3</sub>NiP<sub>3</sub>O<sub>10</sub>, 12H<sub>2</sub>O (powder data; Corbridge & Tromans, 1958). Another group of  $P_3O_{10}^{5-}$ containing complexes reflect their preparation from solution by the inclusion of ammonia in the stoichiometry of the solid, for example, (NH<sub>4</sub>)Be<sub>2</sub>P<sub>3</sub>O<sub>10</sub> (Bagieu-Beucher, Durif & Averbuch-Pouchot, 1976; Averbuch-Pouchot, Durif, Coing-Boyat & Guitel, 1977). A third type of complex is both hydrated and contains  $NH_4^+$ , for example,  $(NH_4)_4NaP_3O_{10}.4H_2O$  (Averbuch-Pouchot & Durif, 1985). There are few examples of pure ceramics of the type  $M_r P_3 O_{10}$ . Only Ag<sub>5</sub>P<sub>3</sub>O<sub>10</sub> (ATD data only; Lee, 1968) and two forms of Na<sub>5</sub>P<sub>3</sub>O<sub>10</sub> (Corbridge, 1960; Davies & Corbridge, 1958) are known.

We have prepared the first non-hydrated mixedmetal tripolyphosphates. Lithium dicobalt tripolyphosphate and lithium dinickel tripolyphosphate are isotypic and crystallize with alternating layers of metal atoms and tripolyphosphate groups. The  $P_3O_{10}^{5-}$  groups are situated on a mirror plane passing through the P atoms, the bridging O atoms and one O atom of each terminal group. The central P atom of each  $P_3O_{10}^{5-}$  group is eclipsed with one neighboring PO<sub>4</sub> group and shows a staggered arrangement of O atoms with the other neighboring group. P-O-P angles between staggered oxyphosphorus groups are large  $[143.3(2) \text{ and } 142.5(3)^{\circ}]$ for the Co and Ni structures, respectively], but smaller when the adjacent groups are eclipsed [124.8(3) and  $126.4(3)^{\circ}$  for the Co and Ni structures, respectively] (Fig. 1).



Fig. 1. View of the  $P_3O_{10}$  group of lithium dicobalt tripolyphosphate showing the conformation. Displacement ellipsoids are plotted at the 50% probability level.

The transition metal atoms display distorted octahedral coordination geometry with no visible Jahn-Teller distortion for Co [average Co-O 2.136 (3) Å and average Ni-O 2.074 (3) Å]. The Co and Ni octahedra share edges to form staggered chains. These chains are bridged by edge-sharing octahedral lithium motifs (Fig. 2). The Li atoms are situated on inversion cen-