(In the parallel setting of the double crystal X-ray spectrometer, Z = total number of electrons in the unit cell, θ_0 is the Bragg angle and δ is the unit decrement of refractive index of the crystal.)

These X-ray diffraction intensity and peak width measurements show that the (111) plane of γ-CuI contains Cu^+ ions while the $(\bar{1}\bar{1}\bar{1})$ plane contains I^-. Moreover, the studies showed that the natural faces of the tetrahedral crystals were of the $(\bar{1}\bar{1}\bar{1})$ index. This study demonstrates the feasibility of working with single crystals as small as 1 mm in diameter for direct crystallographic polarity determinations using a double crystal X-ray spectrometer.

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Ce_2O_2Sb and Ce_2O_2Bi crystal structure.*

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Ce_2O_2Sb and Ce_2O_2Bi crystals were prepared with body-centered tetragonal (U_2N_2Sb type structure, space group $I4/mmm$) unit-cell parameters

	a_0	c_0	u
Ce_2O_2Sb	4·012 ± 0·001 Å	13·697 ± 0·008 Å	0·344 ± 0·003
Ce_2O_2Bi	4·034 ± 0·001	13·736 ± 0·002	0·344 ± 0·003

Compounds with the chemical formula Ce_2O_2X, X = Sb and Bi, were prepared by reaction of weighed quantities of fused Ce_2O_3 + Ce and of elemental X in sealed silica capsules for one month at 800°. X-ray diffraction powder patterns of the two products could be indexed on the basis of tetragonal symmetry. Unit-cell dimensions and densities calculated for two molecules per unit cell are listed in Table 1.

The powder patterns are similar to that of the U_2N_2Sb type previously reported for U and Th compounds (Benz & Zachariasen, 1970) and to Ce_2O_2Te (Pardo & Flahaut, 1962). Accordingly, the structure is

$$\begin{aligned}&\text{Space group } I4/mmm\ (D_{4h}^{17})\\&(000)\ (\tfrac{1}{2}\tfrac{1}{2}\tfrac{1}{2}) + 2\mathrm{X}\text{ on }(000)\\&4\mathrm{Ce}\text{ in } \pm(00u)\\&4\mathrm{O}\text{ in } \pm(\tfrac{1}{2}0\tfrac{1}{4})\end{aligned}$$

where from observed intensities the parameter value was

Table 1. *Lattice-parameter data and densities of* Ce_2O_2X *compounds*

	a_0	b_0	u	v	Reference	Density (g.cm^{-3})
Ce_2O_2Sb	4·012 ± 0·001 Å	13·697 ± 0·008 Å	0·344 ± 0·003	—	This work	6·540 ± 0·007
Ce_2O_2Bi	4·034 ± 0·001	13·736 ± 0·002	0·344 ± 0·003	—	This work	7·747 ± 0·02
Ce_2O_2Te	4·0705 ± 0·0006	12·904 ± 0·002	0·344 ± 0·003	—	This work	6·835 ± 0·004
	4·09	12·92			Pardo & Flahaut (1962)	6·76
Ce_2O_2S	4·001 ± 0·002	6·844 ± 0·006	0·278 ± 0·003	0·63	This work	6·028 ± 0·01
	4·01 ± 0·01	6·83 ± 0·03	0·29 ± 0·02	0·64	Zachariasen (1949)	5·99
	4·00	6·87	—	—	Flahaut & Guittard (1955)	6·00
	4·004	6·872	—	—	Picon & Patrie (1956)	6·00
	4·008	6·886	0·208	0·863	Flahaut, Guittard & Patrie (1958)	5·98
Ce_2O_2Se	4·0152 ± 0·0003	7·0492 ± 0·0009	0·293 ± 0·003	0·63	This work	6·603 ± 0·002
	4·04 ± 0·01	7·06 ± 0·01	—		Benacerraf, Guittard, Domange & Flahaut (1959)	6·51

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* Work done under the auspices of the U.S. Atomic Energy Commission.

determined as being $u=0{\cdot}344\pm0{\cdot}003$. Nearest-neighbor interatomic distances are listed in Table 2.

Table 2. *Nearest-neighbor interatomic distances in* Ce_2O_2X *compounds*

	Ce–4O, (±0·02 Å)	Ce–3X, (±0·02 Å)
Ce_2O_2S	2·39	2·99
Ce_2O_2Se	2·38	3·10
	Ce–4O	Ce–4X
Ce_2O_2Te	2·37	3·51
Ce_2O_2Sb	2·38	3·55
Ce_2O_2Bi	2·39	3·58

Compounds with the analogous compositions M_2N_2S and M_2N_2Se, with M = Th and U (Benz & Zachariasen, 1969), and Ce_2O_2S (Zachariasen, 1949) and Ce_2O_2Se (Benacerraf, Guittard, Domange & Flahaut, 1959) have been reported with a structure distinct from the above with hexagonal symmetry. Crystal structure data on the latter Ce compounds are summarized in Tables 1 and 2. Compounds M_2N_2P and M_2N_2As, with M = U and Th also exist with this same structure (Benz & Zachariasen, 1970) and one might expect that compounds Ce_2O_2P and Ce_2O_2As might exist with this hexagonal structure too. However, all attempts to prepare these two compounds were unsuccessful. Presumably, insufficient energy is gained when Ce^{3+} is promoted to the Ce^{4+} state with formation of X^{3-} (X = P and As) ions as would be required to stabilize the compounds under our experimental conditions (*ca.* 800°).

We made attempts to replace O by N atoms in the crystal lattice of the various Ce compounds by heating selected $Ce_2(O,N)_2X$ mixtures in N_2. No significant change of unit-cell dimensions of the compounds in the product mixtures was observed.

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Structure cristalline de $RbAlSi_3O_8$.

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The crystal structure of rubidium feldspar $RbAlSi_3O_8$ has been refined by the least-square method. The final *R* factor is 0·07 for the isotropic refinement. Atomic coordinates, interatomic distances and angles show that the structure is very similar to that of sanidized orthoclase: Al and Si are disordered over the tetrahedral sites.

Des monocristaux de $RbAlSi_3O_8$ de type feldspath ont été obtenus par Ghélis (1970) par cristallisation, pendant une semaine, d'un gel de cette composition à 600° et 1000 bars dans un tube en or scellé. Leurs dimensions comprises entre 50 et 80μ rendent possible une étude par diffraction des rayons X.

Nous avons utilisé un diffractomètre automatique Nonius pour mesurer, par la méthode d'intégration $\theta/2\theta$, 771 réflexions indépendantes telles que $F_o\min \geq F_o\max/10$ avec la radiation Mo $K\alpha$ pour θ compris entre 0 et 35°.

Les paramètres sont $a=8{,}820$, $b=12{,}992$, $c=7{,}161$ Å, $\beta=116{,}24°$. Le groupe spatial est $C2/m$ avec $Z=4$.

Nous avons introduit les coordonnées atomiques trouvées par Colville & Ribbe (1968) pour l'orthose comme point de départ d'un affinement par moindres carrés sur ordinateur 360 IBM d'après le programme de Busing &

Tableau 1. *Coordonnées atomiques, en fraction de maille, et facteurs de température isotropes*

Les écarts-type (entre parenthèses) portent sur le dernier chiffre.

	$RbAlSi_3O_8$				Sanidine		
Atome	*x*	*y*	*z*	β	*x*	*y*	*z*
4Rb (ou K)	0,2958 (2)	0	0,1468 (3)	1,88 (3)	0,2840	0	0,1352
$8T_1$	0,0104 (3)	0,1904 (2)	0,2227 (4)	0,76 (4)	0,0097	0,1850	0,2233
$8T_2$	0,7227 (3)	0,1195 (2)	0,3440 (4)	0,75 (4)	0,7089	0,1178	0,3444
$4O_A(1)$	0	0,1525 (9)	0	1,6 (2)	0	0,1472	0
$4O_A(2)$	0,664 (1)	0	0,283 (2)	1,7 (2)	0,6343	0	0,2858
$8O_B$	0,832 (1)	0,1596 (6)	0,226 (1)	1,5 (1)	0,8273	0,1469	0,2253
$8O_C$	0,0464 (9)	0,3145 (6)	0,263 (1)	1,4 (1)	0,0347	0,3100	0,2579
$8O_D$	0,1682 (9)	0,1283 (6)	0,403 (1)	1,5 (1)	0,1793	0,1269	0,4024