the general position is $\pm(x, y, z;\ \bar{x}, \bar{y}, \frac{1}{2}+z;\ \bar{y}, x, \frac{3}{4}+z;\ y, \bar{x}, \frac{1}{4}+z)$ and let us find the phase relation corresponding to the symmetry operation $\mathbf{r}(xyz) \rightarrow \mathbf{r}'(\bar{y}, x, \frac{3}{4}+z)$.

This is done in four steps.

(1) Form the scalar product
$\mathbf{h}.\mathbf{r}' = h(\bar{y}) + kx + l(\frac{3}{4}+z)$.

(2) Isolate the translational component which gives rise to a phase factor $a = \exp 2\pi i \frac{3}{4} l = \exp(3\pi i l/2)$.

(3) Rewrite the resting scalar product in the form $\mathbf{r}.\mathbf{h}' = xk + y(\bar{h}) + zl$, *i.e.* bring xyz into their usual sequence.

(4) The desired symmetry relation between structure factors is
$F(\mathbf{h}) = aF(\mathbf{h}')$, *i.e.*
$F(hkl) = \exp(3\pi i l/2) F(k\bar{h}l)$.

If the reader is able to show that to the points $\mathbf{r}(xyz)$ and $\mathbf{r}'(\frac{1}{4}-z, \frac{1}{4}-y, x)$ of group $Fd3m(O_h^7)$ No. 227 corresponds the phase relation $F(hkl) = F(l\bar{k}\bar{h})\exp(\pi i(h+k)/2)$ he will probably have understood how to use the method.

The theoretical proof may be found in French (Bertaut, 1959), in English (Bertaut & Waser, 1957) and in German (Bertaut, 1958).

In Jeffery's (1963) notation, the phase relation under (4) reads

$$\alpha_{hkl} = \alpha_{k\bar{h}l} + (3\pi/2)\, l$$

whereas Jeffery writes

$$\alpha_{hkl} = \alpha_{\bar{k}hl} + (3\pi/2)\, l\,.$$

We must conclude and have checked that in Tables 1 and 2 given by Jeffery, $\alpha_{\bar{k}hl}$ should be replaced by $\alpha_{k\bar{h}l}$ and, *vice versa*, $\alpha_{k\bar{h}l}$ should be replaced by $\alpha_{\bar{k}hl}$.

Finally let us mention that all phase relations for centrosymmetric groups are given in *Tables de Linéarisation des Facteurs de Structure* (Bertaut & Dulac, 1955, 1956).

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Lattice constants of some double sulphates $M_2Co(SO_4)_2 . 6H_2O$.

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The lattice constants of four isomorphous cobalt double sulphates $M_2Co(SO_4)_2 6H_2O$, with M = K, Rb, NH_4 and Cs, have been determined from powder X-ray photographs with a quadruple Guinier—de Wolff camera (de Wolff, 1948) and Cu $K\alpha$ radiation. Because of the larger deviations on the two outer strips, only the inner ones were used, one recording the powder lines of the cobalt double sulphate, the other recording the lines of a reference substance for which we chose potassium aluminum alum. In a separate measurement on a Debye-Scherrer X-ray photograph taken in a cylindrical camera with 9 cm diameter the unit cell edge of the potassium aluminum alum was found to be $12{\cdot}157_8$ Å, in excellent agreement with the value $12{\cdot}158 \pm 0{\cdot}001$ Å found by Klug & Alexander (1940).

Calibration of each film was based on this value of the alum unit cell edge. The measured line positions appeared to be, within the limits of errors, a linear function of the calculated positions.

Irregular deviations as found by Fisher (1957) were not observed.

With this linear function the line positions of the sulphates were corrected and the constants in the relation

$$\sin^2\theta = Ah^2 + Bk^2 + Cl^2 + Dhl$$

were calculated. B was found from $\sin^2\theta$ differences between hk_1l and hk_2l reflexions, A from $hk0$ reflexions, C from $0kl$ reflexions and from $\sin^2\theta$ differences between hkl and $h\bar{k}l$ reflexions and D from all hkl reflexions. Table 1 gives the calculated lattice constants with the standard deviation of the mean. The morphological axial ratios were taken from Groth (1908).

Table 1. *Lattice constants of* $M_2Co(SO_4)_2 . 6H_2O$

	K	Rb	NH_4	Cs
a_0	$9{\cdot}061 \pm 0{\cdot}003$ Å	$9{\cdot}180 \pm 0{\cdot}001$ Å	$9{\cdot}247 \pm 0{\cdot}001$ Å	$9{\cdot}316 \pm 0{\cdot}001$ Å
b_0	$12{\cdot}207 \pm 0{\cdot}001$	$12{\cdot}433 \pm 0{\cdot}001$	$12{\cdot}519 \pm 0{\cdot}001$	$12{\cdot}824 \pm 0{\cdot}001$
c_0	$6{\cdot}151 \pm 0{\cdot}002$	$6{\cdot}230 \pm 0{\cdot}003$	$6{\cdot}239 \pm 0{\cdot}001$	$6{\cdot}365 \pm 0{\cdot}002$
β	104° 48′ ± 2′	106° 01′ ± 1′	107° 02′ ± 1′	107° 07′ ± 1′
β (morph.)	104° 55′	106° 01′	106° 56′	107° 08′
Axial ratio	0·7423 : 1 : 0·5039	0·7384 : 1 : 0·5011	0·7386 : 1 : 0·4984	0·7265 : 1 : 0·4963
Axial ratio (morph.)	0·7404 : 1 : 0·5037	0·7391 : 1 : 0·5011	0·7392 : 1 : 0·4985	0·7270 : 1 : 0·4968

Table 2. *Observed and calculated* $10^5.\sin^2\theta$ *values of* $M_2Co(SO_4)_2.6H_2O$

M = K

hkl	$10^5.\sin^2\theta$ obs.	$10^5.\sin^2\theta$ calc.
020	1601	1592
001	1694	1677
011	2074	2075
$11\bar{1}$	2266	2267
200	3096	3092
021	3271	3270
111	3420	3430
$20\bar{1}$	3598	3606
$21\bar{1}$	4009	4004
130	4348	4356
121	4624	4625
031	5261	5260
$13\bar{1}$	5450	5451
201	5937	5933
211	6350	6331
040		6370
002	6711	6711
$11\bar{2}$		6717
310	7367	7355
221	7511	7525
$21\bar{2}$	7894	7872
$12\bar{2}$		7911
$14\bar{1}$	8236	8238
$32\bar{1}$	8487	8481
231	9521	9516
$33\bar{1}$	10468	10472
241	12299	12303
250	13060	13044
042		13079
$24\bar{2}$	13840	13844
420	13963	13960
331		13963

M = Rb

hkl	$10^5.\sin^2\theta$ obs.	$10^5.\sin^2\theta$ calc.
110	1144	1146
020	1544	1535
001	1661	1655
$11\bar{1}$	2189	2181
120	2300	2297
200	3046	3048
021	3192	3190
210	3435	3432
130	4209	4216
220	4580	4583
$13\bar{1}$	5251	5251
201	5935	5941
040	6145	6140
211	6325	6325
230	6508	6502
140	6904	6902
$31\bar{1}$	7030	7038
$20\bar{2}$	7184	7188
310	7243	7241
221	7466	7476
$21\bar{2}$	7572	7572
$12\bar{2}$	7681	7677
041	7801	7795
$14\bar{1}$	7929	7938
$32\bar{1}$	8183	8189
320	8397	8393
$22\bar{2}$	8712	8723
240	9188	9188
231	9388	9395
$13\bar{2}$	9601	9595
$24\bar{1}$		9604
$33\bar{1}$	10113	10108
051	11258	11249
$41\bar{1}$	11743	11752
321	11898	11905
132	12068	12073
241		12082
042	12774	12759
$34\bar{1}$		12794
$25\bar{1}$	13061	13058
$24\bar{2}$	13323	13329
420	13722	13726
$20\bar{3}$	14228	14222
$41\bar{2}$		14238
003	14881	14891

M = NH_4

hkl	$10^5.\sin^2\theta$ obs.	$10^5.\sin^2\theta$ calc.
020	1518	1514
001	1670	1667
011	2048	2046
$11\bar{1}$	2148	2146
120	2276	2273
200	3033	3036
021	3182	3181
$12\bar{1}$	3282	3281
$20\bar{1}$	3378	3385
111	3470	3464
$21\bar{1}$	3766	3764
130	4170	4166
220	4558	4550
121	4600	4599
$22\bar{1}$	4895	4899
031	5078	5074
$13\bar{1}$	5174	5174
201	6020	6021
040	6061	6056
211	6399	6400
$11\bar{2}$	6491	6488
131		6492
140	6815	6815
$31\bar{1}$	6899	6900
$20\bar{2}$	7068	7069
310	7211	7210
221	7535	7537
$12\bar{2}$	7621	7624
$32\bar{1}$	8033	8034
112	9120	9124
231	9429	9428
$31\bar{2}$	9929	9925
$33\bar{1}$		9928
122	10253	10260
241	12082	12078
212	12726	12719
042		12725
340	12884	12887
420	13653	13658

M = Cs

hkl	$10^5.\sin^2\theta$ obs.	$10^5.\sin^2\theta$ calc.
110	1110	1109
001	1602	1603
011	1963	1964
120	2192	2192
021	3048	3046
$12\bar{1}$	3154	3149
$20\bar{1}$	3305	3307
210	3363	3355
111		3358
$21\bar{1}$	3667	3667
130	3997	3995
220	4435	4437
121		4440
$13\bar{1}$	4954	4953
040	5771	5772
201	5891	5888
$11\bar{2}$	6233	6232
$31\bar{1}$	6771	6764
012		6774
$20\bar{2}$	6821	6826
310	7097	7097
$12\bar{2}$	7322	7314
221		7331
141	7485	7479
$32\bar{1}$	7837	7847
320	8181	8180
240	8771	8766
141		8770
$24\bar{1}$	9103	9079
$13\bar{2}$		9118
$31\bar{2}$	9462	9638
$33\bar{1}$		9650
032		9661
122	9896	9896
330	9982	9983
051	10616	10622
311		10637
$32\bar{2}$	10711	10720
$15\bar{1}$		10725
$41\bar{1}$	11362	11358

Table 2 lists the observed $\sin^2\theta$ values of the measured reflexions, together with the calculated values.

The crystals were prepared by Mrs. H. Zandbergen of the Kamerlingh Onnes Laboratorium and the X-ray photographs were taken by Mr. A. Verhoorn.

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Paramètres et groupes spatiaux du chlorodurène et du bromodurène.

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Les mesures diélectriques ont montré que de nombreux dérivés pentasubstitués du benzène présentaient du polymorphisme. Nous avons entrepris l'étude des structures de différentes phases du chloro-1-tétraméthyl-2,3,5,6-benzène (monochlorodurène) et du bromo-1-tétraméthyl-2,3,5,6-benzène (monobromodurène). Nous avons