heated to its melting point and quenched to room temperature. A change was noticed in the powder photograph, which although not leading to a change in symmetry indicated changes in lattice constants. These were calculated and differed in the following way from the original: a- and c-axes were each reduced by about 0·02 Å. The treatment had been rather drastic and as the analyses did not indicate an impurity which could have caused this, the change was not clearly understood. More recently, the $YFeO_3$ was made by J. P. Remeika both by the original method (Remeika, 1956) and by a modification of that method. These gave patterns and lattice constants not like the original, but rather like the melted and quenched sample. Subsequently, a very pure ceramic sample was made by D. W. Mitchell by a coprecipitation technique as has been used by Mitchell to prepare rare earth garnets (see for example Gilleo & Geller, 1958). This sample also gives a pattern much the same as the first melted and quenched sample and the more recent specimens made by Remeika.

Table 1. *Powder diffraction data for* $YFeO_3$, CrK *radiation*

Index	d_o	d_c	I
110	3·811*	3·839	*vvw*
002		3·801	
111	3·409	3·427	*m–s*
020	2·784	2·796	*m*
112	2·688	2·701	*vs*
200	2·630	2·640	*m–s*
021	2·616	2·624	*w–m*
211	2·272	2·277	*w–m*
022	2·247	2·252	*vw*
202	2·162	2·168	*w*
113	2·108	2·115	*w–m*
122	2·066	2·072	*vvw*
220	1·915	1·919	*m–s*
004	1·898	1·900	*m*
023	1·875	1·877	*w–m*
221	1·856	1·861	*m*
213	1·735	1·737	*vvw*
301	1·710	1·714	*s*
222		1·713	
131		1·712	
311	1·637	1·639	*vw*
132	1·594	1·595	*m*
024	1·571	1·572	*m*
204	1·541	1·542	*m*
312	1·534	1·536	*s*
303	1·443	1·445	*m–s*
133		1·444	
232	1·412	1·413	*vvw*
115		1·413	
313	1·398	1·399	*vvw*
040		1·398	
322	1·386	1·387	*vvw*
041	1·374	1·375	*w–m*
224	1·350	1·350	*s*
025	1·3362	1·3356	*vvw*
400	1·3206	1·3199	*w–m*
042	1·3115	1·3120	*w*
215	1·2826	1·2823	*vvw*
006	1·2672	1·2669	*w*
411		1·2666	
331	1·2618	1·2619	*m–s*
043	1·2240	1·2240	*vw*
241	1·2195	1·2194	*m–s*
332	1·2126	1·2127	*w–m*
116	1·2031	1·2031	*s*
420	1·1936	1·1936	*w–m*
225	1·1916	1·1918	*m–s*
421	1·1791	1·1791	*m*
242	1·1750	1·1749	*w–m*
305	1·1502	1·1505	*s*
135		1·1498	

* Broad.

The powder pattern reported here (Table 1) is that of the specimen made by Mitchell. The lattice constants are:

$$a = 5{\cdot}280,\ b = 5{\cdot}592,\ c = 7{\cdot}602 \text{ all} \pm 0{\cdot}003 \text{ Å} .$$

The volume of the unit cell is 224·5 Å^3 and the X-ray density, 5·71 g.cm.$^{-3}$. The pseudocell dimensions are:

$$a\ (= c) = 3{\cdot}845,\ b = 3{\cdot}801,\ \beta = 93{\cdot}3^\circ .$$

The 'minimum average interionic distances' (see Geller & Wood, 1956, and Geller, 1957*a*) in $YFeO_3$ are:

$$Y^{3+}\text{–}Y^{3+} = 3{\cdot}828,\quad Y^{3+}\text{–}O^{2-} = 2{\cdot}708,\quad Fe^{3+}\text{–}O^{2-} = 1{\cdot}914 \text{ Å} .$$

The effect on the calculated relative ionic sizes (Geller, 1957*b*) is negligible ($\leq$ 0·001 Å).

Because the repetition of the original procedure produced crystals with the unit cell and pattern given here, it appears that the presence of lead could not be the cause of the difference.* Furthermore, analysis of the original material did not indicate an impurity of any amount which could cause such a significant difference. We therefore do not really know the cause, but believe that the pattern given in Table 1 is the one which should be used.

Several of the other orthoferrites were prepared again by Remeika's modified method and no differences found between the more recent powder patterns and those given in the paper by Geller & Wood (1956). It is also noteworthy that the new lattice constants allow $YFeO_3$ to fit better into the scheme of the perovskite-like crystals. For example, the difference in pseudocell axes $|a-b|$ is 0·044 Å with $\beta = 93{\cdot}3^\circ$ (see Geller, 1957*a*, p. 246).

The author wishes to thank J. P. Remeika and D. W. Mitchell for supplying the $YFeO_3$ specimens and C. E. Miller for taking and measuring the powder photographs.

References

Geller, S. (1957*a*). *Acta Cryst.* **10**, 243.
Geller, S. (1957*b*). *Acta Cryst.* **10**, 248.
Geller, S. & Wood, E. A. (1956). *Acta Cryst.* **9**, 563.
Gilleo, M. A. & Geller, S. (1958). *Phys. Rev.* In the press.
Remeika, J. P. (1956). *J. Amer. Chem. Soc.* **78**, 4259.

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* We had indicated earlier that the Pb probably did not enter the structure.

Notes and News

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On behalf of the Union the Executive Committee has accepted with gratitude from the Canadian National Committee the sum of $2106 representing the balance of the funds in respect of the Fourth General Assembly and International Congress.