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Bond-valence summation for borates: errata.

By GABRIELLE DONNAY and J. D. H. DONNAY, *Department of Geological Sciences, McGill University, P.O. Box* 6070, *Station A, Montreal, Quebec, Canada H3C* 3G1

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In Table 1 of Donnay & Donnay [*Acta Cryst.* (1973), B**29**, 1417–1425], (O–H) should read (B–O); on p. 1424, $L \leq \bar{L}$ should read $L \geq \bar{L}$.

The following errata should be corrected in Donnay & Donnay (1973): p. 1418, Table 1: in the title and first column heading, instead of (O–H), read (B–O); p. 1424, 1st column, line 14 from bottom of page: instead of $L \leq \bar{L}$ read $L \geq \bar{L}$.

Reference

DONNAY, G. & DONNAY, J. D. H. (1973). *Acta Cryst.* B**29**, 1417–1425.

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New compounds of $Yb_3Fe_4O_{10}$ and $Yb_4Fe_5O_{13}$.

By NOBORU KIMIZUKA, KATSUO KATO, ISAMU SHINDO and ISAO KAWADA, *National Institute for Researches in Inorganic Materials, Sakura-mura, Niihari-gun, Ibaraki* 300-31, *Japan* and TAKASHI KATSURA, *Faculty of Science, Tokyo Institute of Technology, Ookayama, Meguroku, Tokyo* 152, *Japan*

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New compounds of $Yb_3Fe_4O_{10}$ [$(YbFeO_3)_3FeO$] and $Yb_4Fe_5O_{13}$ [$(YbFeO_3)_4FeO$] have been found in the $YbFeO_3$–FeO pseudo-binary system and their crystallographic data determined. The structural relations of $Yb_3Fe_4O_{10}$ and $Yb_4Fe_5O_{13}$ to the previously determined $YbFe_2O_4$ and $Yb_2Fe_3O_7$ are presented.

Introduction

In the pseudo-binary system of $(A/B)FeO_3$–FeO, the $(AFeO_3)FeO$ and the $(BFeO_3)_2FeO$ types of compound (A = Y, Ho, Er, Tm, Yb and Lu; B = Yb and Lu) have so far been synthesized under controlled oxygen partial pressures at 1200°C (Kimizuka, Takenaka, Sasada & Katsura, 1975*a*, *b*; Tannières, Evrard & Aubry, 1974) and crystal structure analyses have been performed on $YbFe_2O_4$ (Kato, Kawada, Kimizuka & Katsura, 1975) and $Yb_2Fe_3O_7$ (Kato, Kawada, Kimizuka, Shindo & Katsura, 1976). The crystal structure of $(Yb,Eu)Fe_2O_4$ has been independently determined by Malaman, Evrard, Tannières & Aubry (1975). The present paper reports the existence of the new compounds of $Yb_3Fe_4O_{10}$ and $Yb_4Fe_5O_{13}$ along with their crystallographic data and their structural relations to the compounds of $YbFe_2O_4$ and $Yb_2Fe_3O_7$.

Sample preparation

99·99% purity grade Yb_2O_3 (Shinetsu Chemical Co.) and guaranteed reagent grade Fe_2O_3 (3/4 in mole ratio) were thoroughly mixed in an agate mortar under ethyl alcohol and heated at 1200°C in air for two days. The mixture was then placed in a crucible (10 × 10 mm φ) of 20% Rh–Pt alloy and heated at 1650 ± 1°C in a CO_2 gas (99·99%) atmosphere using a vertical Mo-wire wound furnace. Reaction time was 30 min and the sample was rapidly cooled to ice temperature.

X-ray powder diffraction by a counter diffractometer (Mn-filtered Fe $K\alpha$ radiation and Si standard) revealed that the polycrystalline material thus obtained was a mixture of $Yb_2Fe_3O_7$, $Yb_3Fe_4O_{10}$ and $Yb_4Fe_5O_{13}$. The crystals of the former two phases were grown large enough to be examined by single-crystal methods.

Table 1. *Spacings and relative intensities of* $Yb_3Fe_4O_{10}$

	h	k	l	d_{obs} (Å)	d_{calc} (Å)	I_{obs}
1	0	0	3	19·8	20·3	1
2	0	0	6	10·07	10·13	15
3	0	0	9	6·726	6·754	80
4	0	0	12	5·055	5·066	80
5	0	0	15	4·054	4·053	30
6	0	0	18	3·359	3·377	5
7	0	0	21	2·8929	2·8948	100
8	1	0	10	2·7013	2·7063	20
9	1	0	13	2·5377	2·5383	10
10	0	0	24		2·5329	
11	0	0	27	2·2548	2·2515	2
12	$\bar{1}$	0	20	2·1411	2·1432	3
13	1	0	22	2·0419	2·0394	5
14	1	0	25	1·8933	1·8945	3
15	$\bar{1}$	0	26	1·8474	1·8493	10
16	1	1	0	1·7452	1·7450	20
17	1	0	31	1·6430	1·6451	3
18	$\bar{1}$	0	32	1·6086	1·6084	3
19	1	0	34	1·5407	1·5388	3
20	$\bar{2}$	0	1	1·5110	1·5107	5
21	1	1	21	1·4963	1·4955	10
22	$\bar{2}$	0	10	1·4659	1·4666	8
23	0	0	42	1·4467	1·4474	30
24	$\bar{1}$	0	38	1·4141	1·4139	3