

ERRATUM

Erratum: "Heteroepitaxy of rare-earth hexa-aluminates on sapphire" [J. Mater. Res. **9**, 410–419 (1994)]

K. J. Vaidya,^{a)} C. Y. Yang, M. DeGraef,^{b)} and F. F. Lange

Materials Department, College of Engineering, University of California, Santa Barbara, California 93106

(Received 14 February 1994; accepted 16 February 1994)

After this article was accepted for publication in the February issue of *Journal of Materials Research*, the authors recognized that the in-plane orientation of hexa-aluminates on basal plane sapphire was reported correctly, but incorrectly related to the differential lattice strain and the atomic arrangements of the basal planes of the two structures.

The sapphire (α -Al₂O₃) and magnetoplumbite structures have different crystallographic symmetries and unit cell definitions. Although the crystal symmetry of sapphire is rhombohedral¹ (space group $R\bar{3}c$), its lattice is quite commonly represented with hexagonal Miller indices.² In its hexagonal representation, the a -axis direction for sapphire is $\langle\bar{1}2\bar{1}0\rangle$, which is rotated 30° from the close-packed oxygen direction ($\langle 10\bar{1}0\rangle$) within the basal oxygen plane. The magnetoplumbite structure is truly hexagonal (space group $P6_3/mmc$).³ The a -axis direction ($\langle\bar{1}2\bar{1}0\rangle$) for the magnetoplumbite structure is coincident with the close-packed oxygen direction; this direction is commonly used to define the a -axis for structures

with hexagonal symmetry. The observed and reported in-plane epitaxial relation, $\langle\bar{1}2\bar{1}0\rangle_s \parallel \langle 10\bar{1}0\rangle_{mp}$, cannot be interpreted as a 30° rotation of the basal oxygen planes, as reported. Instead, this observation shows that the close-packed oxygen directions of the two structures are parallel. With this correct interpretation, the basal oxygen planes of the two structures are simply translated relative to one another as they are in the two respective structures. This translation preserves the 6-fold and 4-fold coordination sites for Al³⁺ ions at the interface between the two structures. In addition, the in-plane lattice strain calculated using the average basal plane oxygen-oxygen separation distance in these two structures (0.275 nm for α -Al₂O₃,² and between 0.278 nm and 0.280 nm for the rare-earth magnetoplumbites⁴) at room temperature is ~1.5%.

REFERENCES

1. W. E. Lee and K. P. D. Lagerlof, *J. Electron. Microsc. Technol.* **2**, 247–258 (1985).
2. M. L. Kronberg, *Acta Metall.* **5**, 507–524 (1957).
3. A. Kahn, A. M. Lejus, M. Madsac, J. Thery, D. Vivien, and J. C. Bernier, *J. Appl. Phys.* **52**, 6864–6869 (1981).
4. S. C. Abrahams, P. Marsh, and C. D. Brandle, *J. Chem. Phys.* **86**, 4221–4227 (1987).

^{a)}Present address: Department of Chemical Engineering and Materials Science, University of Minnesota, 191 Amundson Hall, 421 Washington Avenue S.E., Minneapolis, Minnesota 55455-0132.

^{b)}Present address: Department of Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, Pennsylvania 15213.