Equivalent planes for Laue classes $\bar{3}m1$ and $\bar{3}1m$. Correction of an error in International Tables for X-ray Crystallography. By J. K. Nimmo, Department of Physics, University of Queensland, St. Lucia, Brisbane, Queensland, Australia 4067

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Abstract

The equivalence relationships for general planes (or reflexions) in Laue class $\bar{3}1m$ are different from those for Laue class $\bar{3}m1$. Table 3.5.1 of International Tables for X-ray Crystallography [(1969). Vol. I. Birmingham: Kynoch Press] makes no allowance for these differences. The necessary corrections are given.

For Laue class 3 (with hexagonal lattice), planes of general form can be grouped into four sets where within each set all planes are equivalent. These sets are

Set (1): $hkil$, $hiki$, $ikhl$, $ihkl$;  
Set (2): $hikl$, $hkil$, $ikhi$, $ihki$;  
Set (3): $hikl$, $hkil$, $ihkl$, $ihki$;  
Set (4): $hkil$, $ihkl$, $ikhi$, $ihki$.

For Laue classes $\bar{3}m1$ and $\bar{3}1m$ the above relationships also hold, but there are additional equivalence relationships as follows

$\bar{3}m1$: Set (1) = Set (2);  
Set (3) = Set (4);  
$\bar{3}1m$: Set (1) = Set (3);  
Set (2) = Set (4).

These results follow immediately from the stereograms given in Fig. 1.

Table 3.5.1 of International Tables for X-ray Crystallography (1969) fails to indicate that the equivalence relationships for general reflexions in Laue class $\bar{3}1m$ are different from those for Laue class $\bar{3}m1$. The necessary corrections to that table are given in Table 1 of the present text.

Reference


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