A CHECK ON UNIT CELL CONSTANTS DERIVED FROM 1-LAYER-LINE WEISSENBERG PICTURES

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Buerger (*Am. Mineral.*, **22,** 416–435, 1937) has summarized the methods of obtaining all lattice constants from one crystal setting. A check on the constants which are derived from 1-layer-line Weissenberg pictures is here proposed, since these constants cannot be obtained so accurately, as a rule. The volume of the unit cell of a triclinic mineral may be computed from constants derived from rotation and 0-layer-line pictures, alone. The result is more accurate than that obtained when constants derived from the 1-layer-line picture are also used. Consequently, any considerable variation in the volumes obtained in these two ways indicates an error in the determination of the 1-layer-line constants. For example:

Rotation and 0-layer-line Weissenberg pictures about c[001] give the values for a^*, b^*, γ^* and c_0, all of which may be accurately derived. Now:

$$a_0=\frac{\lambda}{a^*}\cdot\frac{1}{\sin\beta\sin\gamma^*}=\frac{d_{(100)}}{\sin\beta\sin\gamma^*};\quad b_0=\frac{\lambda}{b^*}\cdot\frac{1}{\sin\alpha\sin\gamma^*}=\frac{d_{(010)}}{\sin\alpha\sin\gamma^*}.$$

The volume is:

$$\begin{aligned}V_0&=a_0b_0c_0\sin\alpha\sin\beta\sin\gamma^*\\&=\frac{\lambda}{a^*\sin\beta\sin\gamma^*}\cdot\frac{\lambda}{b^*\sin\alpha\sin\gamma^*}\cdot c_0\sin\alpha\sin\beta\sin\gamma^*\\&=\frac{\lambda^2c_0}{a^*b^*\sin\gamma^*}=\frac{d_{(100)}\cdot d_{(010)}}{\sin\gamma^*}c_0.\end{aligned}$$