

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:

$$\begin{aligned} V_0 &= a_0 b_0 c_0 \sin \alpha \sin \beta \sin \gamma^* \\ &= \frac{\lambda}{a^* \sin \beta \sin \gamma^*} \cdot \frac{\lambda}{b^* \sin \alpha \sin \gamma^*} \cdot c_0 \sin \alpha \sin \beta \sin \gamma^* \\ &= \frac{\lambda^2 c_0}{a^* b^* \sin \gamma^*} = \frac{d_{(100)} \cdot d_{(010)}}{\sin \gamma^*} c_0. \end{aligned}$$