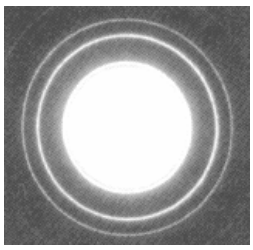
DIFFRACTION STANDARD
EVAPORATED ALUMINUM
PRODUCT NO. 619



Aluminum Diffraction Pattern

In order to use a standard in electron diffraction properly, several conditions are necessary:

1) After obtaining the pattern of an unknown, it is necessary to expose the known standard to the same electrical and magnetic conditions, specifically the same lens current or high voltage.
(2) The specimen must be in the same position as the unknown had been. Small movements of the stage are permissible in order to obtain a clearer pattern of the standard.

After developing the diffraction plates, the standard is measured first. The indices are assigned per the attached ASTM "d" spacings. After assigning the spacings, calculate "K" using the formula K = Sd; where "K" is a constant that represents wave length of the beam, camera length and associated variable crystallographic data, "S" is the diameter of the ring in centimeters and "d" is the interplanar spacing in angstroms. The values for "K" for the first five lines should be within 1% of each other. Use the mean value of "K".

Next, the pattern of the unknown is measured, and using "K", determined from the standard, the "d" spacings of the unknown are calculated. It is then necessary to establish identity of the unknown from the ASTM published data.

Aluminum: ASTM "d" spacings

Miller Indices hk1	Lattice Spacing d (Å)	Intensity I	Lattice Constant a (Å)
111	2.338	100	4.050
200	2.024	47	4.048
220	1.431	22	4.047
311	1.221	24	4.0489
222	1.1690	7	4.0495
400	1.0124	2	4.0496
331	0.9289	8	4.0490
420	.9055	8	4.0495
422	.8266	8	4.0495

Average unit cell from last five lines.....4.0494

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