209.1 X-Ray Diffraction (powder and solid forms)

SRMs 656, 676, 674b, 1878a and 1879a consist of high phase purity materials for use in the quantitative analysis of samples by the internal standard method. SRM 656 consists of 2 silicon nitride powders, one high in α, the other high in β. SRMs 640c, 660a, 675, and 1976 consist of materials with select crystallographic and microstructure properties used in the evaluation of diffraction equipment for the following variables; 1) d-spacing or line position, 2) line or instrument intensity, and 3) instrumental or sample contributions to the shape of reflection profiles. SRM 1976, a sintered alumina plate, is also certified with respect to lattice parameters as well as 12 relative intensity values from 25° to 145° 2θ (Cu K_α). SRM 1990 is certified for lattice parameter. SRM 1994 is certified for miss orientation of the crystal axis relative to the surface normal. SRM 2910 is a high purity synthetic calcium hydroxyapatite for which line profile, relative intensity, lattice parameter, and crystallographically disordered material fraction reference data have been provided.

Technical Contact: james.cline@nist.gov Technical Contact: eric.benck@nist.gov for SRM 1994

PLEASE NOTE: The tables are presented to facilitate comparisons among a family of materials to help customers select the best SRM for their needs. For specific values and uncertainties, the certificate is the only official source.

SRM	Description	XRD Application	Lattice Parameters (in nm)	Unit Size (in g)
640c	Silicon Powder 2θ/d-Spacing	Line Position	(0.54311946 ± 0.00000092)	7.5
656	Silicon Nitride	Quantitative Analysis	α-(0.7752630 / 0.5619372) β-(0.7602293 / 0.2906827)	10 10
660a	Lanthanum Hexaboride Powder	Line Position	(0.41569162 ± 0.00000097)	6
674b	X-Ray Powder Diffraction Intensity Set	Quantitative Analysis		
	CeO_2 (fluorite structure)		(0.541651)	10
	Cr_2O_3 (corundum structure)		(0.4950979 / 1.359592)	10
	TiO_2 (rutile)		(0.4593927 / 0.2958875)	10
	ZnO (wurtzite structure)		(0.3249897 / 0.520653)	10
675	Mica	Line Position - Low 2θ	0.998104	7.5
676a	Alumina Powder for Quantitative Analysis by X-ray Diffraction	Quantitative Analysis	0.47590914 / 1.2991779	20
1878a	Respirable Alpha Quartz	Quantitative Analysis		5
1879a	Respirable Cristobalite	Quantitative Analysis		5
1976	XRD Instrument Sensitivity, Alumina Plate	Instrument Response	0.4758846/1.299306	4.5 x 0.16cm
1990	Single Crystal Diffractometer Alignment Standard	Quantitative Analysis		3 Spheres
1994	Standard Silicon Single Crystal Wafer for Crystalline Orientation	Crystalline Orientation		100-mm wafer
2910	Calcium Hydroxyapatite	Quantitative Analysis	(a-0.942253) (c-0.688501)	2

Values in parentheses are not certified but are provided as reference values or are given for information only.