

ภาคผนวก

ข้อมูลการเลี้ยวเบนของรังสีเอ็กซ์ของ Sn
ไฟล์มาตรฐาน JCPDS No. 4-673

Pattern : 4-673		Radiation = 1.540600		Quality : High		
Sn		2θ	<i>l</i>	<i>h</i>	<i>k</i>	<i>l</i>
		30.645	100	2	0	0
		32.019	90	1	0	1
Tin, syn / Tin		43.872	34	2	2	0
		44.903	74	2	1	1
		55.332	17	3	0	1
		62.540	23	1	1	2
		63.785	13	4	0	0
		64.578	20	3	2	1
		72.416	15	4	2	0
		73.198	15	4	1	1
		79.472	20	3	1	2
		89.412	13	4	3	1
		95.167	3	1	0	3
		95.565	5	3	3	2
		96.699	2	4	4	0
		97.418	5	5	2	1
		103.275	5	2	1	3
		104.868	2	6	0	0
		111.663	3	3	0	3
		112.101	13	5	1	2
		113.348	5	6	2	0
		114.130	5	6	1	1
		120.599	4	3	2	3
		123.246	2	5	4	1
		130.416	4	4	1	3
		130.976	10	5	3	2
		133.431	4	6	3	1
		144.590	6	6	4	0
		145.859	3	7	0	1
<p>Lattice : Body-centered tetragonal Mol. weight = 118.69</p> <p>S.G. : I41/amd (141) Volume [CD] = 108.19</p> <p>a = 5.83100 Dx = 7.287</p> <p>c = 3.18200</p> <p>Z = 4 //cor = 1.97</p>						
<p>GENERAL COMMENTS : Space group given by Mark, Polanyi, Z. Phys., 18 75-96 (1925).</p> <p>SAMPLE SOURCE OR LOCALITY : Sample was furnished by Johnson Matthey Company, Ltd. and annealed 12 hours at 160 C.</p> <p>ANALYSIS : Analysis (wt. %): Pb 0.0012, Sb 0.001, Fe 0.00027, Cu 0.0002, As 0.0002, Bi 0.00012, S 0.0003, Sn 99.997 (by difference), other form alpha-Sn (cubic).</p> <p>TEMP. OF DATA COLLECTION : Pattern taken at 26 C.</p> <p>MELTING POINT : 231.8 deg.</p> <p>COLOR : Light gray metallic</p> <p>GENERAL COMMENTS : Color from Dana's System of Mineralogy, 7th Ed., 485.</p>						
<p>CAS: 7440-31-5</p> <p>*Natl. Bur. Stand. (U.S.), Circ. 539, volume 0, page 24, (1953) primary reference : Swanson, Tatge.</p>						
<p>Radiation : CuKα1 Filter : Beta</p> <p>Lambda : 1.54056 d-sp : Not given</p> <p>SS/FOM : F29=70(0.0125,33)</p>						

ข้อมูลการเลี้ยวเบนของรังสีเอ็กซ์ของ SnS₂
ไฟล์มาตรฐาน JCPDS No. 40-1467

Pattern : 40-1467		Radiation = 1.540600		Quality : Indexed		
Sn S ₂		2th	l	h	k	j
Tin Sulfide		28.227	75	1	0	0
		30.278	10	0	0	2
		32.113	100	1	0	1
		41.867	75	1	0	2
		46.134	5	0	0	3
		49.961	90	1	1	0
		52.455	90	1	1	1
		54.972	20	1	0	3
		58.357	75	2	0	0
		59.557	20	1	1	2
		60.634	90	2	0	1
		62.965	10	0	0	4
		67.143	75	2	0	2
		70.359	20	1	1	3
		77.475	20	2	0	3
		80.353	75	2	1	0
		82.352	90	2	1	1
		84.378	10	1	1	4
		88.189	75	2	1	2
		94.029	90	3	0	0
		95.944	75	3	0	1
		97.956	20	2	1	3
Lattice : Hexagonal S.G. : P-3m1 (164) a = 3.64780 c = 5.89800 Z = 1		Mol. weight = 182.81 Volume [CD] = 67.97 Dx = 4.466 Dm = 3.400				
GENERAL COMMENTS : 2H polytype. SAMPLE PREPARATION : Prepared by chemical transport. Single-crystals ground with silicon.						
*J. Appl. Crystallogr., volume 22, page 622, (1989) primary reference : Palosz, B., Salje, E.						
Radiation : CuK α 1 Lambda : 1.54056 SS/FOM : F22=51(0.0161,27)		Filter : Monochromator crystal d-sp : Guinier Internal standard : Si				

ข้อมูลการเลี้ยวเบนของรังสีเอกซ์ของ SnS

ไฟล์มาตรฐาน JCPDS No. 65-3766

PDF#65-3766: QM=Star/Calculated; d=Other/Unknown; l=(Unknown)												PDF Card					
Tin Sulfide																	
SnS																	
Radiation=CuKa1				Lambda=1.5406				Filter=									
Calibration=				d-Cutoff=				l/c(RIR)=4.4									
Ref= Level-1 PDF																	
Orthorhombic, Pbnm(62)										Z=4		mp=					
Cell=4.334x11.2x3.987<90x90x90>																	
Density(c)=5.174			Density(m)=			Mwt=			Vol=			Pearson=					
Ref= Ibid.																	
Strong Line: 2.84/X 3.25/7 3.43/7 2.80/7 2.93/5 1.88/5 2.31/4 4.04/3																	
158 Lines, Wavelength to Compute Theta = 1.54056A(Cu), I%-Type = (Unknown)																	
#	d(A)	l(f)	h	k	l	#	d(A)	l(f)	h	k	l	#	d(A)	l(f)	h	k	l
1	5.6000	0.2	0	2	0	44	1.3583	4.6	3	0	1	87	1.0355	1.3	3	7	1
2	4.0419	34.0	1	1	0	45	1.3473	5.0	3	1	1	88	1.0278	5.2	4	2	1
3	3.4274	69.6	1	2	0	46	1.3322	0.6	2	6	1	89	1.0257	4.1	1	9	2
4	3.2479	71.9	0	2	1	47	1.3209	3.0	0	8	1	90	1.0129	0.1	2	8	2
5	2.9343	54.5	1	0	1	48	1.2998	9.4	1	6	2	91	1.0110	5.2	2	5	3
6	2.8385	100.0	1	1	1	49	1.2931	2.5	0	2	3	92	1.0054	0.2	3	8	0
7	2.8000	68.5	0	4	0	50	1.2872	3.2	2	7	0	93	0.9967	1.3	0	0	4
8	2.5991	0.2	1	2	1	51	1.2838	1.7	3	4	0	94	0.9950	2.2	1	7	3
9	2.3519	0.7	1	4	0	52	1.2764	1.5	3	3	1	95	0.9912	2.8	3	6	2
10	2.3070	40.8	1	3	1	53	1.2706	2.3	1	0	3	96	0.9813	0.1	0	2	4
11	2.2914	4.2	0	4	1	54	1.2625	10.8	1	8	1	97	0.9781	1.1	3	0	3
12	2.1670	2.2	2	0	0	55	1.2391	0.1	1	2	3	98	0.9749	3.6	3	8	1
13	2.1275	19.7	2	1	0	56	1.2273	3.0	2	5	2	99	0.9678	0.6	2	6	3
14	2.0257	30.8	1	4	1	57	1.2249	2.4	2	7	1	100	0.9654	0.2	2	10	1
15	2.0210	15.5	2	2	0	58	1.2221	5.9	3	4	1	101	0.9639	0.8	0	8	3
16	1.9935	23.9	0	0	2	59	1.2141	1.0	3	5	0	102	0.9619	0.6	1	11	1
17	1.9899	19.2	1	5	0	60	1.2028	3.0	1	3	3	103	0.9571	1.1	1	2	4
18	1.8770	46.0	0	2	2	61	1.2006	3.2	0	4	3	104	0.9526	2.4	1	10	2
19	1.8742	19.8	2	3	0	62	1.1961	2.2	1	9	0	105	0.9490	1.6	2	9	2
20	1.8026	1.4	2	2	1	63	1.1759	0.1	2	8	0	106	0.9462	0.6	3	3	3
21	1.7879	5.4	1	1	2	64	1.1635	2.2	3	1	2	107	0.9443	0.9	3	7	2
22	1.7805	17.4	1	5	1	65	1.1614	1.1	3	5	1	108	0.9428	0.2	3	9	0
23	1.7232	13.9	1	2	2	66	1.1571	2.8	1	4	3	109	0.9409	2.4	1	8	3
24	1.7144	15.8	1	6	0	67	1.1535	1.5	2	6	2	110	0.9390	4.2	0	4	4
25	1.6961	9.8	2	3	1	68	1.1457	11.6	0	8	2	111	0.9371	1.0	4	6	0
26	1.6905	12.4	0	6	1	69	1.1425	4.1	3	6	0	112	0.9333	0.4	0	12	0
27	1.6295	1.1	1	3	2	70	1.1272	5.0	2	8	1	113	0.9246	0.4	2	7	3
28	1.6240	18.8	0	4	2	71	1.1200	0.1	0	10	0	114	0.9234	1.7	3	4	3
29	1.5744	1.8	1	6	1	72	1.1163	2.0	3	3	2	115	0.9215	1.2	2	11	0
30	1.5575	4.5	2	5	0	73	1.1104	0.2	2	2	3	116	0.9177	0.2	1	4	4
31	1.5207	0.3	1	4	2	74	1.1077	0.3	1	8	2	117	0.9122	6.0	1	12	0
32	1.5010	0.1	1	7	0	75	1.1052	2.4	1	5	3	118	0.9088	0.6	0	12	1
33	1.4671	0.9	2	0	2	76	1.0983	0.1	3	6	1	119	0.9055	0.1	2	0	4
34	1.4547	8.7	2	1	2	77	1.0841	4.4	2	3	3	120	0.9026	1.2	2	1	4
35	1.4507	14.7	2	5	1	78	1.0826	1.4	0	6	3	121	0.9013	1.3	4	4	2
36	1.4328	2.9	3	1	0	79	1.0813	3.9	2	7	2	122	0.8979	0.8	2	11	1
37	1.4192	0.1	2	2	2	80	1.0783	6.2	4	1	0	123	0.8939	0.1	2	2	4
38	1.4143	0.3	2	6	0	81	1.0723	0.7	3	7	0	124	0.8912	0.8	1	5	4
39	1.4083	4.9	1	5	2	82	1.0638	0.1	4	2	0	125	0.8902	0.2	2	10	2
40	1.4047	6.5	1	7	1	83	1.0502	0.4	1	6	3	126	0.8894	3.0	1	12	1
41	1.4000	10.0	0	8	0	84	1.0464	0.1	1	10	1	127	0.8875	0.6	1	11	2
42	1.3655	7.8	2	3	2	85	1.0417	6.2	2	9	1	128	0.8852	0.6	3	10	0
43	1.3626	3.9	0	6	2	86	1.0389	1.0	3	5	2	129	0.8800	2.8	2	8	3

ข้อมูลการเลี้ยวเบนของรังสีเอ็กซ์ของ SnS
ไฟล์มาตรฐาน JCPDS No. 65-3766 (ต่อ)

PDF#65-3766: QM=Star/Calculated; d=Other/Unknown; I=(Unknown)												PDF Card					
Tin Sulfide																	
SnS																	
#	d(A)	I(f)	h	k	l	#	d(A)	I(f)	h	k	l	#	d(A)	I(f)	h	k	l
130	0.8761	0.1	4	5	2	140	0.8395	0.8	2	5	4	150	0.8193	0.1	4	3	3
131	0.8753	0.1	4	7	1	141	0.8378	3.8	2	9	3	151	0.8182	1.4	3	1	4
132	0.8664	0.1	3	6	3	142	0.8365	1.4	2	11	2	152	0.8172	0.1	4	9	0
133	0.8642	1.2	5	1	0	143	0.8345	1.4	3	7	3	153	0.8147	2.6	2	6	4
134	0.8617	2.2	1	6	4	144	0.8323	0.5	3	11	0	154	0.8120	3.2	0	8	4
135	0.8584	3.2	5	2	0	145	0.8305	5.8	4	2	3	155	0.8107	0.3	5	4	1
136	0.8523	0.3	3	9	2	146	0.8296	0.2	1	12	2	156	0.8090	1.0	3	10	2
137	0.8481	0.3	4	6	2	147	0.8280	1.4	5	4	0	157	0.8044	0.1	4	4	3
138	0.8470	0.1	5	0	1	148	0.8266	0.2	1	13	1	158	0.8018	1.1	3	8	3
139	0.8450	2.8	1	13	0	149	0.8260	0.6	5	3	1						