Appendix

The Joint Committee for Powder Diffraction Standards (JCPDS) of $FeVO_4$

Name and formula

Reference code:	00-038-1372
Compound name:	Iron Vanadium Oxide
PDF index name:	Iron Vanadium Oxide
Empirical formula:	FeO_4V
Chemical formula:	$FeVO_4$

Crystallographic parameters

Crystal system:	Anorthic
Space group:	P-1
Space group number:	2
a (Å):	8.0572
b (Å):	9.3470
c (Å):	6.7138
Alpha (°):	106.5900
Beta (°):	101.5260
Gamma (°):	96.6900
Volume of cell (10^6 pm^3):	466.62
Z:	6.00
RIR:	-

Subfiles and quality

Subfiles:	Common Phase
	Corrosion
	Inorganic

NBS pattern

Quality: Star (S)

Comments

Color: Gray-brown

Creation Date: 1/1/1970

Modification Date: 1/1/1970

Temperature of Data Collection: The mean temperature of data collection was 25.1 C

Structures: The unit cell of $FeVO_4$ was determined by Robertson and Kostiner

Sample Preparation: There are several high pressure forms of $FeVO_4$, Muller and Joubert

Additional Patterns: To replace 25-418, 24-541 and 30-667

Sample Preparation: The sample was prepared by heating a 1:1 molar mixture of Fe_2O_3 and V_2O_5 at 840 C overnight. It was then made into pellets and heated at 850 C for 17 hours

Color: Gray-brown.

References

Primary reference: Wong-Ng, W., McMurdie, H., Paretzkin, B., Hubbard, C., Dragoo, A., NBS (USA)., *ICDD Grant-in-Aid*, (1987)

Structure: 1. Muller, J., Joubert, J-C., *J. Solid State Chem.*, **14**, 8, (1975)

Unit cell: Wong-Ng, W., McMurdie, H., Paretzkin, B., Hubbard, C., Dragoo, A., *Powder Diffraction*, **3**, 52, (1988)

Other: 2. Robertson, B., Kostiner, E., *J. Solid State Chem.*, **4**, 29, (1972)

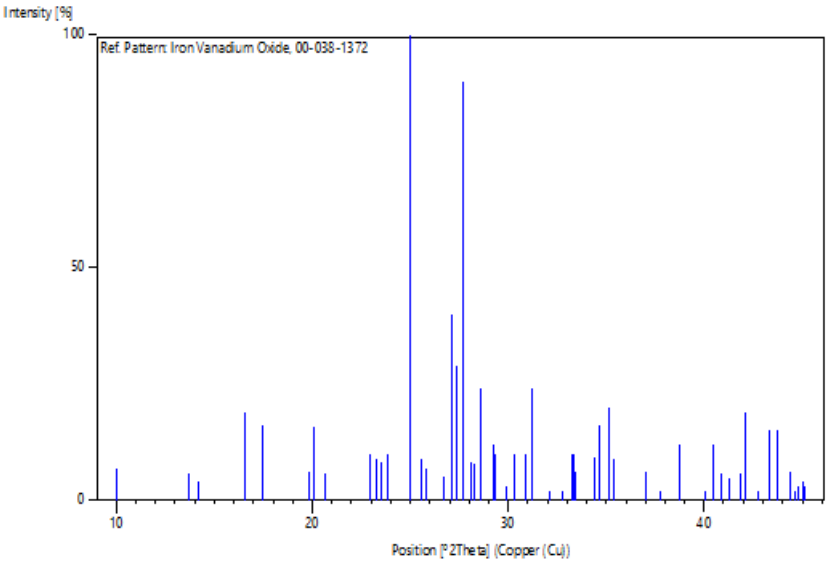
Peak list

No.	h	k	l	d [A]	2Theta[deg]	I [%]
1	0	1	0	8.81007	10.032	7.0

2	-1	1	0	6.44905	13.720	6.0
3	0	0	1	6.22776	14.210	4.0
4	1	1	0	5.35275	16.548	19.0
5	-1	-1	1	5.06508	17.495	16.0
6	0	1	1	4.46559	19.866	6.0
7	-1	1	1	4.41826	20.081	16.0
8	0	-2	1	4.29779	20.650	6.0
9	2	0	0	3.87801	22.914	10.0
10	-2	1	0	3.82191	23.255	9.0
11	1	-2	1	3.77470	23.550	8.0
12	-2	0	1	3.72759	23.852	10.0
13	1	2	0	3.55812	25.006	100.0
14	1	1	1	3.48626	25.530	9.0
15	-2	-1	1	3.44933	25.808	7.0
16	2	1	0	3.33241	26.730	5.0
17	0	-1	2	3.28691	27.107	40.0
18	-1	-1	2	3.25791	27.353	29.0
19	-2	2	0	3.22096	27.673	90.0
20	-1	0	2	3.17541	28.078	8.0
21	0	2	1	3.15538	28.260	8.0
22	0	0	2	3.12237	28.565	24.0
23	0	-3	1	3.05365	29.222	12.0
24	0	-2	2	3.04225	29.334	10.0
25	2	0	1	2.98301	29.930	3.0
26	-1	-2	2	2.94419	30.334	10.0
27	2	-2	1	2.89666	30.844	10.0
28	-2	-2	1	2.86245	31.222	24.0
29	-2	0	2	2.78791	32.079	2.0
30	1	-2	2	2.73068	32.770	2.0
31	1	2	1	2.69188	33.256	10.0
32	0	1	2	2.68365	33.361	10.0
33	2	2	0	2.67562	33.464	6.0

34	2	1	1	2.60214	34.438	9.0
35	3	0	0	2.58830	34.628	16.0
36	-2	1	2	2.54971	35.169	20.0
37	-2	-2	2	2.53298	35.409	9.0
38	1	-3	2	2.42403	37.057	6.0
39	0	3	1	2.38172	37.740	2.0
40	-2	-3	1	2.31968	38.789	12.0
41	-3	-1	2	2.24897	40.060	2.0
42	-1	-1	3	2.22940	40.427	12.0
43	3	0	1	2.20573	40.880	6.0
44	0	-1	3	2.18502	41.285	5.0
45	2	3	0	2.15726	41.841	6.0
46	-3	3	0	2.14698	42.051	19.0
47	2	-3	2	2.11272	42.766	2.0
48	-3	-2	2	2.08757	43.307	15.0
49	3	2	0	2.06894	43.717	15.0
50	-2	-2	3	2.03729	44.432	6.0
51	0	-3	3	2.02660	44.679	2.0
52	1	4	0	2.02137	44.801	3.0
53	-3	3	1	2.01166	45.029	4.0
54	1	2	2	2.00659	45.149	3.0

Stick Pattern



The Joint Committee for Powder Diffraction Standards (JCPDS) of BiOI

Name and formula

Reference code:	00-010-0445
Compound name:	Bismuth Oxide Iodide
PDF index name:	Bismuth Oxide Iodide
Empirical formula:	BiIO
Chemical formula:	BiOI

Crystallographic parameters

Crystal system:	Tetragonal
Space group:	P4/nmm
Space group number:	129
a (Å):	3.9940
b (Å):	3.9940
c (Å):	9.1490
Alpha (°):	90.0000
Beta (°):	90.0000
Gamma (°):	90.0000
Calculated density (g/cm^3):	8.01
Volume of cell (10^6 pm^3):	145.95
Z:	2.00
RIR:	-

Subfiles and quality

Subfiles:	Common Phase
	Inorganic
	NBS pattern
Quality:	Star (S)

Comments

Color:	Dark red-orange

Creation Date:	1/1/1970
Modification Date:	1/1/1970
Sample Preparation:	Sample prepared at NBS, Gaithersburg, Maryland, USA, by reacting Bi_2O_3 with concentrated HI. Pattern was improved by heating the material in air for two hours at 450 C
Analysis:	Spectrographic analysis showed <0.1% Ni; <0.01% Al, Co, Fe, Si
Temperature of Data Collection:	Pattern taken at 25 C
Color:	Dark red-orange
Additional Diffraction Lines:	Plus 19 additional reflections to 0.9414.

References

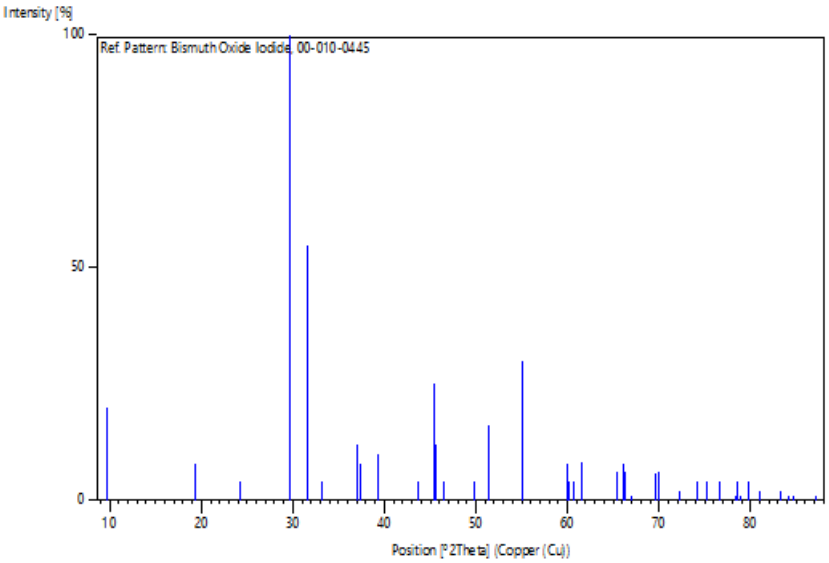
Primary reference: *Natl. Bur. Stand. (U.S.), Circ. 539*, **9**, 16, (1960)

Peak list

No.	h	k	l	d [A]	2Theta[deg]	I [%]
1	0	0	1	9.15000	9.658	20.0
2	0	0	2	4.58000	19.365	8.0
3	1	0	1	3.66100	24.292	4.0
4	1	0	2	3.01100	29.645	100.0
5	1	1	0	2.82400	31.658	55.0
6	1	1	1	2.69900	33.166	4.0
7	1	0	3	2.42400	37.058	12.0
8	1	1	2	2.40300	37.393	8.0
9	0	0	4	2.28700	39.366	10.0
10	1	1	3	2.07200	43.649	4.0
11	2	0	0	1.99700	45.378	25.0
12	1	0	4	1.98500	45.668	12.0
13	2	0	1	1.95200	46.485	4.0
14	0	0	5	1.82900	49.816	4.0
15	1	1	4	1.77800	51.347	16.0

16	2	1	2	1.66400	55.151	30.0
17	2	1	3	1.54100	59.983	8.0
18	1	1	5	1.53590	60.203	4.0
19	0	0	6	1.52460	60.696	4.0
20	2	0	4	1.50450	61.594	8.0
21	1	0	6	1.42440	65.475	6.0
22	2	2	0	1.41200	66.123	8.0
23	2	1	4	1.40780	66.346	6.0
24	2	2	1	1.39570	66.996	1.0
25	2	2	2	1.34950	69.613	6.0
26	1	1	6	1.34220	70.046	6.0
27	0	0	7	1.30730	72.205	2.0
28	3	0	2	1.27860	74.092	4.0
29	3	1	0	1.26340	75.136	4.0
30	1	0	7	1.24240	76.634	4.0
31	3	0	3	1.22000	78.306	1.0
32	3	1	2	1.21760	78.490	4.0
33	2	0	6	1.21210	78.915	1.0
34	2	2	4	1.20170	79.734	4.0
35	1	1	7	1.18600	81.007	2.0
36	2	1	6	1.15970	83.246	2.0
37	3	0	4	1.15020	84.089	1.0
38	0	0	8	1.14360	84.687	1.0
39	2	2	5	1.11810	87.092	1.0

Stick Pattern



Curriculum Vitae

Author's Name Mr. Auttaphon Chachvalvutikul

Date/Year of Birth June 27th, 1995

Place of Birth Bangkok, Thailand

Education

2013-2016 Bachelor of Science in Chemistry (1st class honors, GPA = 3.96/4.00), Department of Chemistry, Faculty of Science, Chiang Mai University, Thailand

2017-Present Master's degree in Chemistry (GPA 4.00/4.00), Department of Chemistry, Faculty of Science, Chiang Mai University, Thailand

Scholarship

2013-Present Development and Promotion of Science and Technology Talents Project (DPST)

Publications

2019 Chachvalvutikul, A., Pudkon, W., Luangwanta, T., Thongtem, T., Thongtem, S., Kittiwachana, S., & Kaowphong, S. (2019). Enhanced photocatalytic degradation of methylene blue by a direct Z-scheme $Bi_2S_3/ZnIn_2S_4$ photocatalyst. Materials

Research Bulletin, 111, 53-60.; Journal Impact Factor 2018: 2.873 with the second quartile (Q2)

2019 Chachvalvutikul, A., Jakmunee, J., Thongtem, S., Kittiwachana, S., & Kaowphong, S. (2019). Novel $FeVO_4/Bi_7O_9I_3$ nanocomposite with enhanced photocatalytic dye degradation and photoelectrochemical properties. Applied Surface Science, 475, 175-184.; Journal Impact Factor 2018: 4.439 with the first quartile (Q1)

Experiences

2014 Being a contestant in Science Competition, Atom games #23 at Faculty of Science and Technology, Thammasat University, Pathum Thani, Thailand

2015 Doing a summer research project on the topic of "Wastewater treatment from heterogeneous materials research" under supervision of Asst. Dr. Chamnan Randorn at Department of Chemistry, Faculty of Science, Chiang Mai University

2015 Giving oral presentation in the title of "Wastewater treatment from heterogeneous materials research" at Department of Chemistry, Faculty of Science, Chiang Mai University, Thailand

2015 Being a participant in Asian Science Camp 2015 Thailand Science Park Convention Centre, National Science and Technology Development Agency, Pathum Thani, Thailand

2016	Doing internship on the synthesis of Indole derivatives at Laboratory of Medicinal Chemistry, Chulabhorn Research Institute, Bangkok, Thailand
2017-2018	Being a teacher assistant in General Chemistry Laboratory for The Health Sciences courses, Faculty of Science, Chiang Mai University, Thailand

International conferences

June 3rd, 2017	Giving an oral presentation on the topic of "Efficient photocatalytic degradation of methylene blue over $Bi_2S_3/ZnIn_2S_4$ photocatalyst" at the First Materials Research Society of Thailand International Conference, Chiang Mai, Thailand
June 26th-28th, 2019	Going to have an oral presentation on the topic of "Novel $FeVO_4$/BiOCl nanocomposite for efficient photocatalytic dye degradation and Cr(VI) reduction under visible light irradiation" at the fifth edition of Nanotech France 2019 International Conference and Exhibition, Paris, France (Abstract is accepted)