

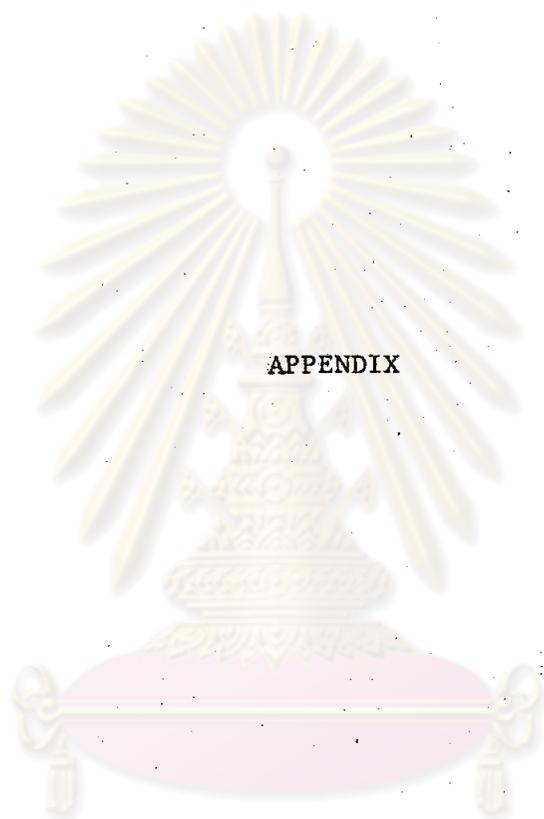


BIBLIOGRAPHY

1. Cullity, B.D. in Elements of X-ray Diffraction, 2nd ed. pp. 497, pp.3-4 Addison-Wesley Publishing Company, Inc., 1978.
2. Freundlich, W. "New ternary in the tungsten-Vanadium-Oxygen system" C.R. Acad. Sc. Paris, 260 (11), (1965).
3. Mondet L., and Suzanne "Crystal Chemistry of the Nonstoichiometric Phases Identified in Vanadium-Tungsten-Oxygen and Lithium-Vanadium-Tungsten-Oxygen System" Rev. Chim. Miner. 1971, 8(3) 391-422.
4. Heurung G. and Gruehn, R. "Inorganic Non-Stoichiometric" Z. Anorg. Allg. Chem. 1984, 513, 175-82.
5. Israelsson M. and Kihlberg L. "The Crystal Structure of Monoclinic Wolfram Vanadium Oxide, $W_3V_5O_{20}$, an OD Structure Related to $R-Nb_2O_5$ " Journal of Solid State Chemistry 1, (1970) : 469-477.
6. Dionne G., Wooley J.G., "Crystal Growth and Isothermal Annealing of $Pb_{1-x}Sn_xTe$ alloys" Journal of the Electrochemical Society 119 (6) (1972) : 784-788.
7. Nuffield, E.W. in X-ray Diffraction Methods, pp.46-47, pp.250-281, pp.66-69, Wiley Sons, Sydney, 1966.
8. Sands, D.E. in Introduction to crystallography, pp.92-94, Benjamin, W.A. Inc., New York, 1969.
9. Stout, G.H. and Jensen, L.H. in X-ray Structure Determination, pp.195-196, pp.219-221, pp.270-281, pp.376-382, 66-67, pp.385-392, 99-120, 83-98, McMillan Company, New York, 1968.
10. Lipson, H. and Cochran W., in the Determination of Crystal Structure, pp.12-15 G. Bell and Sons Ltd, London, 1966.
11. Buerger, M.J., in Contemporary Crystallography pp.317-325, pp.119-123, pp.83-97, McGraw-Hill Book Company, New York, 1970.

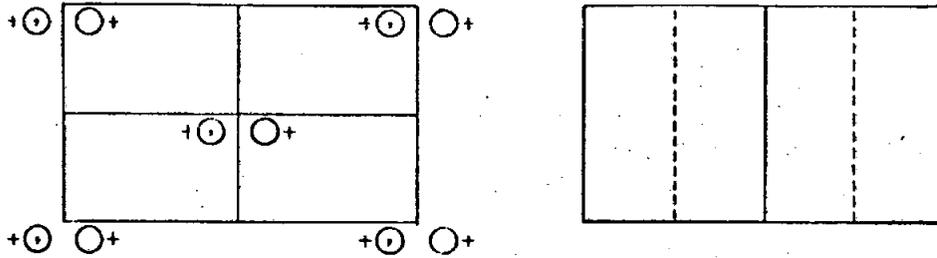
12. Bowen, G.M., in Properties of Solids and their Atomic Structure.
pp.95-96, Mcgraw-Hill Publishing Company Ltd, London, 1967.
13. Tweeddale, T.G., in Materials technology Volume I, first publish
pp.107-108, Butterworth & Co (Publishers) Ltd, London. 1973.
14. Cracknell, A.P. in Crystals and their Structure, pp.165-166,
Pergamon Press 1969.
15. Hull, D. in Introduction to dislocations. pp.12-13, pp.21-22,
Pergamon Press Ltd, Oxford, 1965.
16. Kittle, C., in Introduction to Solid State physics, 5th ed.
pp.571 John Wiley & Sons, Inc., 1976.
17. Azaroff L.V. in Introduction to Solids, pp.105-107, Mcgraw-Hill
Publishing Company Ltd, 1960.
18. Hannay, N.B., in Solid-State Chemistry, pp.57-58, Prentice-Hall
of India Private Limit, New Delhi-110001, 1976.
19. Azaroff L.V. in Crystallography, pp.256-260, Mcgraw-Hill book
Company, 1968.
20. Wooster, W.A. in Diffuse X-ray Reflections from Crystals
pp.113-121, Clarendon Press, Oxford, 1962.
21. Amorós J.L., Buerger, M.J. and Amorós, M.C. in The Laue method.
pp.293-295, Academic Press, New York.
22. Lonsdale K. and H. Smith "An Experimental Study of Diffuse X-ray
Reflection by Single Crystal" Proc. Roy. Soc. A 179 (1942):8-50.
23. Jeffery, J.W. "Unusual X-ray Diffraction Effects-from a Crystal
of Wollastonite" Acta Cryst, 6 (1953) : 821-825.
24. Suzanne Mondet, Alexandre, Rimsky, Jacques Borene and William
Freundlich "Structure Crystalline de la phase WV_2O_7 "
Acad. Sc. Paris, t 266 (1968), pp.1145-1147.

25. Eick H.A. and Lars Kihlberg, "The Crystal Structure of V_2MoO_8 "
Acta Chemica Scandinavica 20 (1966) pp.1658-1666.
26. Van Uitert L.G. and Soden R.R., "Single Crystal-Tungstates for
Resonance and Emission Studies" Journal of Applied Physic
3 (2), (1960) 328-330.
27. Dionne G., Wooley J.G., "Crystal Growth and Isothermal Annealing
of $Pb_{1-x}Sn_xTe$ Alloys" Journal of the Electrochemical Society
119 (6) (1972) : 784-788.
28. Vogel, I, in Macro and Semimicro Qualitative Inorganic Analysis,
4th ed, pp.279, Longmans, 1954.
29. Astle M.J. Beyer W.H., CRC. Handbook of Chemistry and Physic
pp.B-155, B-157. CRC Press Inc., Boca Raton, Florida, 1985-1986.
30. International Tables for X-ray Crystallography, Vol III, pp.17,
Kynoch Press, Birmingham, England, 1962.
31. D'Eye, R.W.M., and Wait E., in X-ray Powder Photograph in Inorganic
Chemistry pp.72, Butterworths Scientific Publications, 1960.
32. Lundgren, J.O. Editor A. Series of Crystallographic Programs for
the IBM 3031-008 System at the computer service centre,
Chulalongkorn University Internal Report, (1984).
33. Ladd, M.F.C. and R.A. Palmer in Structure Determination by X-ray
Crystallography pp.59-6, Plenum Press, New York, 1977.
34. Kaebler E.F., in Handbook of X-rays pp.24-13, 25-14 McGraw-Hill
Book Company, 1967.
35. Cruickshank D.W.J., Philling, D.E, Bujosa, A., Lovell, F.M. and
Truter, M.R. in Computing Method and the Phase Problem pp.32,
Oxford, Pergamon, 1961.



APPENDIX

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



Origin on plane m ; unique axis b

2ND SETTING

Number of positions,
Wyckoff notation,
and point symmetry

Co-ordinates of equivalent positions

Conditions limiting
possible reflections

$$(0,0,0; \frac{1}{2}, \frac{1}{2}, 0)+$$

4 b 1 $x,y,z; x,\bar{y},z.$

General:

$$hkl: h = k - 2n$$

$$h0l: (h = 2n)$$

$$0k0: (k = 2n)$$

2 a m $x,0,z.$

Special: as above only

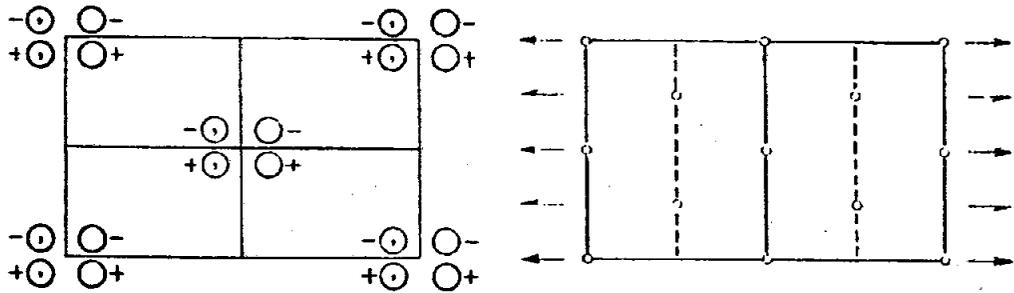
Symmetry of special projections

(001) $c1m$; $a' = a, b' = b$

(100) $pm1$; $b' = b/2, c' = c$

(010) $p1$; $c' = c, a' = a/2$

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



Origin at centre ($2/m$); unique axis b

2ND SETTING

Number of positions,
Wyckoff notation,
and point symmetry

Co-ordinates of equivalent positions

Conditions limiting
possible reflections

$(0,0,0; \frac{1}{2}, \frac{1}{2}, 0)+$

General:

$hkl: h+k=2n$
 $h0l: (h=2n)$
 $0k0: (k=2n)$

Special: as above, plus

8	<i>j</i>	1	$x,y,z; \bar{x},\bar{y},z; \bar{x},y,\bar{z}; x,\bar{y},\bar{z}$
4	<i>i</i>	m	$x,0,z; \bar{x},0,\bar{z}$
4	<i>h</i>	2	$0,y,\frac{1}{2}; 0,\bar{y},\frac{1}{2}$
4	<i>g</i>	2	$0,y,0; 0,\bar{y},0$
4	<i>f</i>	$\bar{1}$	$\frac{1}{2},\frac{1}{2},\frac{1}{2}; \frac{1}{2},\frac{1}{2},\frac{1}{2}$
4	<i>e</i>	$\bar{1}$	$\frac{1}{2},\frac{1}{2},0; \frac{1}{2},\frac{1}{2},0$
2	<i>d</i>	$2/m$	$0,\frac{1}{2},\frac{1}{2}$
2	<i>c</i>	$2/m$	$0,0,\frac{1}{2}$
2	<i>b</i>	$2/m$	$0,\frac{1}{2},0$
2	<i>a</i>	$2/m$	$0,0,0$

no extra conditions

$hkl: h=2n; (k=2n)$

no extra conditions

ศูนย์วิทยุทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Symmetry of special projections

$(001) cmm; a'=a, b'=b$

$(100) pmm; b'=b/2, c'=c$

$(010) p2; c'=c, a'=a/2$

VITA

Miss Aree Hanprasopwattana was born on 26th June 1956 in Bangkok. She received her B.Sc. (Chemistry) from Chulalongkorn University in 1979.

She was granted a leave of absence from Department of Science Service to study for M.Sc. at Chulalongkorn University in 1981-1982.



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย