The results thus strongly indicate that microhardness studies of solid solution series might be utilised in detecting structural breaks and compositional variation.

LIMITATION

The obvious limitation of this technique is that although 20 random grains were examined in each case, the highest value obtained might not represent the maximum hardness. However in all cases the ranges of hardness of each species are so widely apart, compared to the range of hardness variation of a mineral with varying orientation, that this limitation does not seem to affect the general observations and conclusions.

REFERENCES


THE AMERICAN MINERALOLOGIST, VOL. 45, MAY-JUNE, 1960

LATTICE CONSTANTS AND PROBABLE SPACE GROUP OF ANHYDROUS CUPRIC SULFATE (ARTIFICIAL CHALCOCYANITE)*

CARL W. F. T. PISTORIUS, Institute of Geophysics, University of California, Los Angeles 24, California.†

Anhydrous cupric sulfate was prepared by heating Baker and Adamson Reagent Grade CuSO₄·5H₂O to approximately 300° C. for two hours. The x-ray powder diffraction pattern at 25° C. was obtained in a Norelco high angle recording diffractometer, using CuKα radiation (λ = 1.5418 Å) and a Ni filter. The scanning speed was 8° (2θ) per minute.

The indexing was done by means of the similarity to the zinc sulfate pattern (Schiff, 1934) and by using the goniometric value for the axial ratios of natural chalcocyanite, which is orthorhombic dipyramidal (Dana's system, 1951). All the observed diffraction peaks could be satisfactorily assigned as being due to an orthorhombic lattice with the following unit-cell dimensions, obtained by a least-squares treatment: \(a = 8.391 \pm 0.013 \text{ Å}, b = 6.811 \pm 0.010 \text{ Å}, c = 4.791 \pm 0.008 \text{ Å}\).

* Institute of Geophysics Publication No. 194.
† On leave from the National Physical Research Laboratory, South African Council for Scientific and Industrial Research, P. O. Box 395, Pretoria, Transvaal, Union of South Africa.
### Table 1. Powder Data for CuSO₄

<table>
<thead>
<tr>
<th>$d_{obs}$ (Å)</th>
<th>$d_{calc}$ (Å)</th>
<th>$hkl$</th>
<th>100 I/I₀</th>
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<tr>
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<td>101</td>
<td>73</td>
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<td>3.911</td>
<td>3.919</td>
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<td>3.537</td>
<td>3.551</td>
<td>111</td>
<td>100</td>
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<tr>
<td>3.408</td>
<td>3.406</td>
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<tr>
<td>3.163</td>
<td>3.156, 3.156</td>
<td>201, 120*</td>
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<td>2.614</td>
<td>2.644, 2.635</td>
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<td>2.415</td>
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<td>2.315</td>
<td>221</td>
<td>9</td>
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<td>102</td>
<td>13</td>
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<td>2.052</td>
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<td>230, 212, 131</td>
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<td>1.959</td>
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<td>1.672</td>
<td>1.673, 1.669</td>
<td>421, 140*</td>
<td>8</td>
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<td>1.584, 1.578, 1.578, 1.576</td>
<td>501, 402, 240, 141</td>
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<td>1.564</td>
<td>1.569</td>
<td>103</td>
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<td>1.208</td>
<td>602</td>
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<td>701</td>
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<td>1.097</td>
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<td>161, 523, 260</td>
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<tr>
<td>1.081-1.072</td>
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<td>640, 343, 702</td>
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<tr>
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<td>0.9969</td>
<td>0.9965</td>
<td>262</td>
<td>3</td>
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<td>0.9856</td>
<td>0.9851</td>
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<tr>
<td>0.9816</td>
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<tr>
<td>0.9796</td>
<td>0.9796, 0.9802</td>
<td>044, 740*</td>
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<tr>
<td>0.9592</td>
<td>0.9587</td>
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<td>0.9562</td>
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<td>543, 651</td>
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<td>0.9250</td>
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<td>0.9229</td>
<td>0.9228</td>
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<td>0.9140</td>
<td>0.9151</td>
<td>901</td>
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<tr>
<td>0.8057</td>
<td>0.8051, 0.8061</td>
<td>903, 941</td>
<td>4</td>
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</tbody>
</table>
The axial ratio \( a_0:b_0:c_0 = 1.232:1:0.7043 \) agrees reasonably well with the goniometric value \( 1.254:1:0.7086 \), derived from Palache, Berman, Frondel (1951) if their value \( 0.797:1:1.1300 \) is considered to be \( b:a:2c \).

The calculated density of artificial \( \text{CuSO}_4 \) at \( 25^\circ \text{C} \), assuming \( Z=4 \), is \( 3.873 \text{ gm/cm}^3 \). The pycnometric density is \( 3.65 \pm 0.05 \text{ gm/cm}^3 \).

The observed and calculated \( d \)-spacings, assigned indices and observed relative intensities are listed in Table 1. Systematic extinctions are \( 0kl \), \( k+l \) odd; \( h0l \), none; \( hk0 \), \( h \) odd, or \( h+k \) odd. There are three reflections which can be indexed as \( h00 \) with \( h \) odd. These are marked by asterisks in the table. However in each case there is an alternative indexing \( hk0 \) with \( h+k \) even. Accordingly the space group was chosen as \( \text{Pnma} \), if \( \text{CuSO}_4 \) is dipyramidal. This is in agreement with \( \text{ZnSO}_4 \); \( a_0=8.58 \), \( b_0=6.74 \), \( c_0=4.76 \text{ kX} \), \( \text{Pnma} \) (Schiff, 1934).

References


Annual Meeting

The forty-first annual meeting of the Mineralogical Society of America will be held in Denver, Colorado, Monday through Wednesday, October 31-November 2, 1960. Detailed notices will be mailed to all members.

Abstracts of papers to be presented at the annual meeting must be received by the Secretary on or before July 1, 1960. Abstract blanks may be obtained from the Secretary.

Nominations of Officers for 1961

President: E. F. Osborn, Pennsylvania State University, University Park, Pa.
Vice-President: Ian Campbell, California Division of Mines, San Francisco, Calif.
Councilors: (1961–63, two to be elected)
  Stephen E. Clabaugh, University of Texas, Austin, Texas
  William T. Holser, California Research Corporation, La Habra, Calif.
  O. F. Tuttle, Pennsylvania State University, University Park, Pa.
FIFTY-PLUS COMMITTEE

The MSA Fifty-Plus Committee now has 158 members who have pledged a total of $11,960 to the Endowment Fund over a five-year period. Formed last year to help build up the Endowment Fund, the Committee has been so successful that the Society is even now benefiting from the investment of the funds. Through May 31, 1960, $6034 had been received. Membership is open to any member or friend of the Society who wishes to pledge not less than $10 a year for a five-year period. If you would like to join, send a card or note to the Treasurer, Marjorie Hooker, U. S. Geological Survey, Washington 25, D. C. The members of the Committee are listed below:

Abelson, Philip H.  
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Alling, Harold L.  
Amstutz, G. C.  
Anderson, A. Benton  
Anderson, Alfred L.  
Bacon, Charles S.  
Bandy, Mark C.  
Barton, Paul B., Jr.  
Beck, Carl W.  
Berman, Joseph  
Bever, James E.  
Bogue, Richard G.  
Boycot, Arthur J.  
Boyd, Francis R., Jr.  
Bradley, William F.  
Brant, Arthur M.  
Brown, John S.  
Buddington, Arthur F.  
Buerger, Newton W.  
Buie, Bennett F.  
Cameron, Eugene N.  
Campbell, Charles D.  
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Cargille, Ralph P.  
Carroll, Dorothy  
Chesterman, Charles W.  
Chidester, Alfred H.  
Clabaugh, Stephen E.  
Croft, William J.  
Cutitta, Frank  
De Vries, Robert C.  
Donnay, Gabrielle  
Donnay, Joseph D. H.  
Dosse, A. F.  
Earley, James W.  
Eckel, Edwin B.  
Ehrmann, Martin L.  
Eitel, Wilhelm  
Ellestad, R. B.  
Emmons, R. C.  
Engel, A. E. J.  
Enlows, Harold E.  
Erickson, Edwin S., Jr.  
Fahey, Joseph J.  
Fairbairn, Harold W.  
Faust, George T.  
Filer, Russell  
Fisher, D. Jerome  
Flagg, A. L.  
Foster, Margaret D.  
Foster, Wilfrid R.  
Frondeil, Clifford  
Fuller, Richard E.  
Galbraith, Frederic W.  
Gaudin, A. M.  
Gillson, Joseph L.  
Glass, Jewell J.  
Goldich, Samuel S.  
Goldsmith, Julian R.  
Graf, Donald L.  
Grawe, Oliver R.  
Green, Robert S.  
Grogan, Robert M.  
Gruner, John W.  
Grunig, James K.  
Haff, John C.  
Halbouty, Michel T.  
†Hamilton, Peggy-Kay  
Henderson, Edward P.  
Hess, Harold D.  
Hess, Harry H.  
 Hewett, Donnel F.  
Holmes, Ralph J.  
Hooker, Marjorie  
Howland, Arthur L.  
Hunt, Walter F.  
Hurlbut, C. S., Jr.  
Hutton, C. Osborne  
Insley, Herbert  
Isotoff, A.  
Jago, John B.  
Jahns, Richard H.  
Kauffman, Albert J.  
Keller, Walter D.  
Kennedy, George C.  
Kerr, Paul F.  
Knopf, Adolph  
Koebl, Charles  
Kraus, Edward H.  
Larsen, Esper S., Jr.  
Larsen, Esper S., 3d  
Leonard, B. F.  
Levinson, Alfred A.  
Lyons, John B.  
Mason, Brian H.  
Mather, Katharine  
McCaughey, William J.  
McConnell, Duncan  
Merritt, Clifford A.  
Meyrowitz, Robert  
Mielenz, Richard C.  
Mikami, Harry M.  
Milton, Charles  
Moneymaker, B. C.  
Montgomery, Arthur  
Murata, K. J.  
Nason, Howard K.  
Neuberth, George J.  
Noble, James A.  
Osborn, E. F.  
Pabst, Adolf  
Page, Lincoln R.  
Pate, Howard  
Pough, Frederick H.  
Ramsdell, Lewis S.  
Reichen, Laura  

* Deceased
The Walker Mineralogical Club announces that it has awarded its Peacock Memorial Prize (1959) of two hundred dollars “for the best scientific paper on pure or applied mineralogy, including crystallography, mineralogy, petrology, ore genesis, and geochemistry,” submitted by a graduate student, to

Dr. John Gittins,
Department of Geophysics and Geochemistry,
College of Mineral Industries, Pennsylvania State University,
University Park, Pennsylvania.

Dr. Gittins’ paper was entitled “The Petrology of the Nepheline-bearing Rocks of Glamorgan and Monmouth Townships, Ontario, Canada.” He did his work under Prof. C. E. Tilley and Dr. S. R. Nockolds at the University of Cambridge, England. Dr. Gittins emigrated to Canada from Manchester, England, in 1948 and resided in Hamilton, Ontario. Prior to doctoral studies at Cambridge, he attended McMaster University, Hamilton, Ontario, where he earned his B.Sc. in Honour Geology in 1955, and his M.Sc. in 1956.

The Walker Mineralogical Club announces also at this time that it is offering the Peacock Memorial Prize again in 1960.

FRANKLIN-OGDENSBURG MINERALOGICAL SOCIETY

The Franklin-Ogdensburg Mineral Society is a new organization established to provide a framework for a series of active programs designed to benefit the community, the collector and those interested in the minerals, mineralogy and geology of Franklin and Sterling Hill, New Jersey.

1. To establish, in cooperation with other interested groups, and maintain a sound, permanent museum of Franklin minerals in Franklin, N. J.
2. To develop new information on Franklin minerals and mineralogy, through cooperative scientific programs with universities, and other organizations and individuals.

3. To obtain and make available accurate up-to-date information on Franklin minerals and mineralogy.

4. To facilitate collecting of Franklin minerals while conserving material for future collectors.

5. To facilitate identification of Franklin minerals.

6. To promote fellowship and the advancement of mineralogy and geology by providing meetings of those interested in the Franklin area.

Any adult interested in any of these or related programs is invited to join us. Membership dues of $2.00 or questions concerning the Society may be addressed to:

Franklin-Ogdensburg Mineralogical Society, Inc. Box 146
Franklin, New Jersey

THE INDIAN MINERALOGIST

A copy of the first number (Jan. 1960) of the semi-annual journal of the Mineralogical Society of India, "The Indian Mineralogist," has just been received. This number contains 112 pages of format slightly larger than that of The American Mineralogist. The quality of paper, printing, and illustrations (including half-tones and an inset plate) is very good. Our congratulations go to the new Society on this excellent start. The subscription price is Rs. 10/- per year, and articles are invited from everyone. Orders should be sent to the Treasurer of the Mineralogical Society of India, Department of Geology, Karnataka University, Dharwar, India. The contents of this first number is as follows:

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