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The NBS Alloy Data Center: Description of Index to the Literature*

G. C. Carter, D. J. Kahan, L. H. Bennett, J. R. Cuthill, and R. C. Dobbyn

**Institute for Materials Research,
National Bureau of Standards,
Washington, D.C. 20234**

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Computerized listings of 10,000 research papers, indexed at the Alloy Data Center, are now being made available in two forms. In the first, the Permuted Materials Index, all records are arranged alphabetically by chemical symbol. Records referring to alloys or compounds are listed under each of the constituent elements. In the second, the Author Index, all papers are listed alphabetically by first author in three groupings: the first, the NMR papers; the second, the soft x-ray papers; and the third, a broad group of papers that have been of general interest to the Alloy Physics Section. The magnetic tape on which the indexed file is stored will be made available at a future date.

Key words: Alloy data; bibliography; index; information; Knight shifts; NMR; soft x ray.

1. General Discussion

The Alloy Data Center (a part of the National Standard Reference Data System) has developed an automated system for retrieving papers indexed for its internal use. In its first years, the Center has concentrated on nuclear magnetic resonance (NMR) and soft x-ray (SXS) data. There are other topics for which we have entered several papers. These are electronic transport properties, magnetic properties, mechanical properties (density, elastic constants; no engineering properties), resonance properties (such as EPR, Mössbauer effect), quantum description of solids (Fermi surface work, band structures, density of states, etc.), radiation (optical and other), superconductivity, and some thermodynamic properties (e.g., specific heats). The NMR and SXS papers and some papers in these other categories have been deep-indexed and the codes entered in structured format onto magnetic tape.

The following information is available on the tape; the first author and journal citation; main experimental technique; physical properties, usually in order of importance in the paper; materials studied (metals, and alloys, up to quaternary); material composition (in atomic percent); and temperature (absolute scale) at which the work was performed. An example of a page of one of our indices is shown in figure 1.

The magnetic tape, the "Biblio-Master-File," can be manipulated in a number of fashions with various available computer programs. The details of format, tape maintenance, and computer programs, and the various capabilities as well as limitations have been described earlier [1].[1]

The indices are now being made available in hard copy in two forms [2]. The magnetic tape containing the "Biblio-Master-File" will be available in the future. The first printed form is the "Permuted Materials Index" (e.g., a CuNi alloy is listed under both Cu and under Ni) and the second, the "Author Index," lists the papers alphabetically by first author. This latter index has been separated into three parts, according to the specific topics with which the Alloy Data Center has been primarily concerned.

The first part deals with NMR, and is now thought to be complete for Knight shifts (property code 4K, see fig. 1, PROPERTIES column). The total number of such papers is approximately 800. These cover the years 1949 (the discovery of the Knight shift) through 1969. Some papers of the year 1970 are also included. The second part deals with soft x-ray spectra, SXS, and now contains ~500 emission papers; some

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[1] Figures in brackets indicate the literature references at the end of this paper.

ALLOY DATA BIBLIOGRAPHY

**** PERMUTED ALPHABETICAL MATERIAL INDEX ****

FIRST AUTHOR		NO OF AUTHORS	JOURNAL NAME	VOL.	PAGE	YEAR	REFER. NUMBER	SUBJECT	PROPERTIES	CARD NO.	ALLOY	ELE STY	COMP. LO	COMP. HI	TEMP. LO	TEMP. HI	CHAN CODE
LARSON	G	2	PHYS LET	28A	203	1968	680480	FER E		2	CD CR SE AG			28	04	180	
LARSON	G	2	PHYS LET	28A	203	1968	680480	FER E		3	CD CR SE AG			58	04	180	
BACKLUND	N	1	PHYS CHEM SOL	7	94	1958	580020	ETP F	1B		CD CU			00	01	04	
BLATT	F	1	PHYS REV	108	285	1957	570007	ETP T	1D		CD CU			01		00	
HENRY	W	2	CAN J PHYS	38	911	1960	600248	MAG F	2X		CD CU		0	01		300	
HURD	C	2	J PHYS CHEM SOL	29	2205	1968	680598	QDS T	5N 5W 1D 4K 1T 1H		CD CU		0	05			
HURD	C	2	J PHYS CHEM SOL	29	2205	1968	680598	QDS T	8C 2X	1	CD CU		0	05			
KOHN	W	2	PHYS REV	119	912	1960	600095	NMR T	4E 3G 5N		CD CU	2			00	300	
ROWLAND	T	1	PHYS REV	119	900	1960	600068	NMR F	4B		CD CU	2	0	05			
ROWLAND	T	2	PHYS REV	134A	743	1964	640055	NMR F	4K 4R		CD CU	1	0	01			
SAGALYN	P	3	PHYS REV	124	428	1961	610077	NMR T	4E 4B 4A 3N 3G		CD CU	2	0	02			
TEMPLETON	I	3	ABSTRACT OF LT	11C	47	1968	680765	QDS F	5H 5F		CD CU			00			
SATO	H	2	PHYS REV	124	1833	1961	610029	XRA F	3O 8F 3N 5F 5U 5O		CD CU AU				500	700	
SATO	H	2	PHYS REV	124	1833	1961	610029	XRA E	8L	1	CD CU AU				500	700	
SATO	H	2	PHYS REV	124	1833	1961	610029	XRA E		2	CD CU AU				500	700	
FRANKEL	R	6	PHYS LET	15	163	1965	650429	PAC E	4C	*	CD FE			00			
QAIM	S	1	PROC PHYS SOC	90	1065	1967	670151	MOS F	4N		CD FE	2		100		300	
QAIM	S	3	PROC PHYS SOC	2C	1388	1968	680554	MOS E	4A		CD FE	2		100		300	
SEGNAN	R	2	REVSMODERN PHYS	36	408	1964	640504	MOS F	4N 4E		CD FE	2		100		300	
SRIVASTAV	P	3	ACTA MET	16	1199	1968	680602	CON E	8F 0M 3O		CD GA		40	85			
SEKIZAWA	K	2	J PHYS SOC JAP	21	684	1966	660987	MAG E	2I 2T 2B 3O		CD GD			50	04	300	
PETER	M	6	PHYS REV	126	1395	1962	620166	EPR E	4G 3O 4A 2J 2L 2X		CD GD AG			67	01	500	
PETER	M	6	PHYS REV	126	1395	1962	620166	EPR E		1	CD GD AG			30	01	500	
PETER	M	6	PHYS REV	126	1395	1962	620166	EPR E		2	CD GD AG			03	01	500	
PETER	M	1	PROC COL AMPERE	12	1	1963	630128	EPR E	4G 2X 8C 4A 2B		CD GD AG		0	97	20	178	

FIGURE 1. *A typical page of the Permuted Materials Index.*

emission papers published from 1929 to 1940 are included and all papers since 1940 are in the system. Several SXS absorption papers are also in the system but completeness for this group has not been attempted for this listing. The third part contains those papers not dealing specifically with the above named topics, but which are related to them. Examples here are: magnetic susceptibility, density of states, and more generally, Quantum Description of Solids (QDS, see fig. 1, SUBJECT column). In this case there is some overlap, as some of these papers have been included in the soft x-ray files. The topics in the third part of the Author Index are biased somewhat to other research carried out in the Alloy Physics Section, such as Mössbauer effect (MOS, see fig. 1, SUBJECT column), specific heats (electronic and other), and magnetic susceptibility. However, the literature has not been searched specifically for such topics. That is, only a fraction of the total number of papers on these other solid state properties are included. Consequently this third section of the Author Index is useful only in the sense of "some additional information" but does not serve the user as a substitute for a full literature search in these related topics. This is because these additional papers were primarily entered for our own internal use, with no immediate aim toward a compilation of the corresponding properties. On the other hand this Index may be of special interest in that it does include some papers published in the more obscure sources.

We have compiled a list of physical properties pertinent to the general topic of electronic structures of metals. We specifically do not search the literature for several of the properties indicated in this list, as other Data Centers are handling these. Such properties are indexed and therefore retrieved primarily because of our deep indexing scheme: upon fully reading a paper for indexing, such properties are at times described and therefore indexed. These papers can then be brought to the attention of the appropriate Data Centers. Examples of these properties are: phase diagrams [3], structures and lattice constants [4], and diffusion [5]. A compilation of currently existing Data Centers dealing with several of the properties indicated in our List is available in Appendix A of ref. [1]. Another compilation of this kind, for Data Centers covering a much wider scope, has recently become available [6].

We thank R. W. Mebs, A. J. McAlister, I. D. Weisman, and other members of the Alloy Physics Section for their indexing contributions.

2. References

[1] NBS Technical Note 464 (August 1969) by Carter, G., Bennett, L. H., Cuthill, J. R., and Kahan, D. J., available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $1.25.

[2] Copies of the Indices are available under separate cover from the Clearinghouse for Federal Scientific and Technical Information, 5285 Port Royal, Springfield, Va. 22151 as:
a. The NBS Alloy Data Center: Permuted Materials Index, NBS Special Publication 324. This publication is also available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.
b. The NBS Alloy Data Center: Author Index, Office of Standard Reference Data Bibliography Series, OSRD–B–70–2.

[3] Binary Metals and Metalloid Constitution Data Center, Illinois Institute of Technology Research Institute, Chicago, Ill. 60616. The purpose of this center is to keep the compilation "Constitution of Binary Alloys," originally compiled by M. Hansen (McGraw-Hill Book Co., 1958), current.

[4] Pearson, W. P., complete and current compilations are prepared for metals and alloys. See "A Handbook of Lattice Spacings and Structures of Metals and Alloys" (Pergamon, Vol. I, 1958; Vol. II, 1967).

[5] Diffusion in Metals and Alloys Data Center, Institute of Materials Research, National Bureau of Standards, mailing address: Washington, D.C. 20234.

[6] International Compendium of Numerical Data Projects—A Survey and Analysis, produced by CODATA, The Committee on Data for Science and Technology of the International Council of Scientific Unions (Springer Verlag, N.Y., 1969).

(Paper 74A4–619)

Symposium on Electronic Density of States

Electronic Density of States was the subject of the 3d Materials Research Symposium, sponsored by, and held at the National Bureau of Standards, Gaithersburg, Md. on November 3–6, 1969. Attention was focussed on the correlation of various experimental and theoretical techniques such as optical methods; photoelectron, soft x-ray, and ion neutralization spectroscopy; specific heat; Knight shift; and magnetic susceptibility. Band theory and many-body effects, as they relate to the electronic density of states, were included.

Approximately 100 papers were presented at these sessions, including 16 invited presentations. Six of these invited papers were published in the March–April 1970 issue of the Journal, five were published in the May–June 1970 issue, and five appear in this issue. All of the papers presented at the symposium will be published by the National Bureau of Standards as Special Publication 323 which will appear later this year.