

rated the Index as very useful or useful. A large majority found the groupings to be very good or satisfactory as a current awareness source for both chief and peripheral interests. Overall they preferred the Section Groupings to the CJB 2:1. We did note a difference in the latter preference between station personnel and off-station personnel. Station personnel preferred Section Groupings 3:1 while off-station personnel preferred them 1.5:1. This indicates, I believe, that plant people have less reading time available. The much smaller CJB could be scanned more quickly than the Section Groupings, and people with limited reading time missed the bulletin the most. Of course, they get much more material in CA, but some of our users do not care to get everything. They are satisfied with just a selection of material.

Frequent comments on these returned questionnaires were:

"CA takes too long to read."

"The mass of abstracts is overwhelming."

"I like the complete coverage of CA."

"I like the Keyword Index."

"CA is best for my chief interests and CJB was best for peripheral interests."

"I like the patent coverage in CA but wish it were better."

CONCLUSION

A not unexpected result of our switch in current awareness services has been greatly increased interlibrary loan traffic in Lavoisier Library. The CJB covered only journals received by the Library; CA covers many journals difficult to obtain. Our scientists now request many more copies of articles from journals we do not subscribe to. Our interlibrary loan staff has been doubled, we have joined the Center for Research Libraries, and we experience much frustration trying to get copies of articles that seem to be unobtainable. One Russian article abstracted in CA was not available even at the Lenin Library in Moscow. We hope CA will give some thought to making articles of this type available in the future.

As for costs, we are saving more than \$150,000 a year (in 1972 dollars) by using CA Section Groupings for current awareness rather than a bulletin prepared in-house. This figure represents our net savings after deducting the increased costs of interlibrary loans and photocopy services. Now that our users have become accustomed to using CA Section Groupings we think the majority feel that, even without money considerations, it was a wise move. When you add major cost savings to the picture, the decision was inevitable.

Searching *CA Condensates* On-Line vs. the CA Keyword Indexes[†]

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A study was conducted to compare the comprehensiveness of searches performed using Systems Development Corporation's (SDC) Chemcon data base and keyword indexes of *Chemical Abstracts*. It was concluded that, in most cases, a computer search yielded at least as many relevant references as did a manual search. However, in the case of very general search questions, results from manual searches were much more satisfactory.

This study was initiated to compare the results of searches performed on the Chemcon data-base available from Systems Development Corporation with those utilizing the weekly keyword indexes of *Chemical Abstracts*. These indexes must be searched during the period prior to the publication of the volume indexes. All comparisons were performed using Volumes 80 and 81 of *Chemical Abstracts*. At the time this study was underway, Orbit II was in operation. Orbit III has since come on-line.

Since the computer-readable data-base (Chemcon) includes the keyword index entries, it was our intention to use the same keywords for both modes of searching. However, additional qualifiers had to be added in some of the computer searches because of the machine's inability to recognize the context of keywords.

RESULTS

The possibility of four different results was recognized.

1. References located in both modes would be identical.
2. Machine and manual searches would yield supplementary results.
3. References located by computer searching would contain all those located manually and more.
4. Manual searching would yield all references located by the computer and more.

Although all four possibilities occurred during the study, only the third and fourth situation involved significant differences. An example of each of these two search results follows.

Example 1. Possibility No. 3. Computer searching yielded all articles retrieved manually and more.

A search for references to the pyrolysis of polyvinyl chloride is a case where a computer search is more successful. The manual search required eight keywords and the same terms were used for the computer search. The number of relevant references found in each case are shown in Figure 1.

Example 2. Possibility No. 4. Manual searching yielded all those articles located by computer and more.

A search for references to a particular aspect of the

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PYROLYSIS OF POLYVINYL CHLORIDE

	Vol 80	Vol 81
Manual	13	15
Computer	17	21
Hits Found Manually - Not by Computer	0	0
Hits Found by Computer - Not Manually	4	6
Total No. Different Hits	17	21

Figure 1.

CATALYTIC OXIDATION OF ALDEHYDES

	Vol 80	Vol 81
Manual	27	28
Computer A	3	6
Computer B	1	0
Total No. Computer	4	6
Hits Found Manually - Not by Computer	23	22
Hits Found by Computer - Not Manually	0	0
Total No. Different Hits	27	28

Figure 3.

CATALYTIC OXIDATION OF ALDEHYDES

Manual Keywords	Computer Strategy A	Computer Strategy B
Aldehydes	SS1 Oxidn or all Oxidat#	SS1 Oxidn or All Oxidat#
Catalysis	SS2 All Cataly#	SS2 All Cataly#
Catalysts	SS3 All Aldehyde#	SS3 1 + 2
Catalytic Oxidation	SS4 1 + 2 + 3	SS4 Strs :aldehyde:

Figure 2.

chemistry of a broad class of compounds is more profitable when performed manually. This can be illustrated by a search for articles concerning the catalytic oxidation of aldehydes. Figure 2 shows the keywords and the strategy used.

Two strategies were tried in the computer mode to overcome the difficulties of performing a broad search on the computer. Figure 3 shows the number of results found in each case.

Because of the lack of references found by the computer strategies, the terms acrolein and methacrolein were added as an alternative to SS3 in Computer Logic A. The manual search had indicated that a large number of relevant publications concerned these aldehydes. The results of the search are shown in Figure 4. This strategy was obviously more successful and the need for specificity in searching by machine is well illustrated.

DISCUSSION

Articles are located only in the computer mode for one of two reasons. First, the keyword phrases are arranged so that the keywords used are not at the beginning of the phrase. The physical position of the keywords is not significant to the computer and additional references are retrieved.

Secondly, for computer retrieval, it is not necessary for all required keywords to be present in the same keyword phrase. Figure 5 illustrates this point. This search was concerned with determination of nitric oxide by chemiluminescence. The keywords in upper case are those required for a hit.

The obvious reason for references to be retrieved manually and not by the computer is that the specified keywords have not been applied to the publication in question.

CATALYTIC OXIDATION OF ALDEHYDES

Results	Vol 80	Vol 81
Computer C	19	20
Manual (as shown previously)	27	28

Figure 4.

THE DETERMINATION OF NITRIC OXIDE BY CHEMILUMINESCENCE

TI - Research on the Chemical Reactions of Metastable
Atmospheric Gas Species

KW - Atm Gas Chem Reaction: NITROGEN OXIDE Atm Reaction

KW - Oxygen Atom Atm Reaction; Ozone Atm Reaction:
CHEMILUMINESCENCE Atm

Figure 5.

These missing keywords fall into two classes. First, Chemical Abstract Service has a policy not to index general terms when a more specific term can be applied. This accounts for the difference in results of the two modes when searching for the catalytic oxidation of aldehydes. This policy of specific indexing accounts for the majority of unretrieved relevant articles when performing a computer search.

Secondly, articles are missed because of incomplete indexing. This deficiency can be overcome by a manual searcher but not a computer. A manual searcher can make intellectual judgments when a keyword phrase approaches without exactly meeting the requirements for a hit.

CONCLUSIONS

It has become apparent that a search for references to a particular aspect of a class of compounds can be best performed manually. However, since in the majority of the remaining cases a computer search yields at least as many references as a manual search, most requesters are well satisfied with a computer search alone. Manual searching has therefore been discontinued unless a totally comprehensive bibliography is required or the area of interest is very broad. The time saving involved can be interpreted as a cost savings in that it allows the searcher more time for other assignments. It has also increased "customer satisfaction" since the turn-around time between the request for and the receipt of information has been decreased.