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What is the "Core" Literature of Chemical Physics?

March 1, 1972

Two weeks ago, I discussed the core literature of chemistry and biochemistry, and listed the fifty journals cited most frequently by the Journal of the American Chemical Society (JACS) and by Biochemistry. Unfortunately, the Journal of Chemical Physics (JCP) was inadvertently omitted from the list for JACS. JCP is, in fact, the third most-cited journal in the pages of JACS. In contrast, it appears seventeenth in the list of journals most-cited by Biochemistry.

To correct this serious omission, we are reprinting the JACS list. At the same time, we are using the occasion to attempt to answer the analogous question I posed about biochemists. How much of a chemist is a chemical physicist? By publishing a corresponding list of journals cited by the JCP, maybe we have an answer.

As before, the data have been drawn from an analysis of approximately one million citations that appeared in whatever issues we processed for the 2180 journals covered for the last quarter of the 1969 Science Citation Index. The figures in the lists for "times cited" are an approximation of annual citation frequency obtained by quadrupling counts made in analyzing the last-quarter data. As noted, the lists show journals most frequently cited by JACS and JCP. An asterisk preceding a title indicates that the journal in question is

one of the fifty which in turn themselves most frequently cite JACS and JCP respectively.

Alert readers will note, in the list for JACS, that we have combined the entries for Chemical Communications and Journal of the Chemical Society, of which the former is now a section. This is one of the many arbitrary decisions we have had to make in attempts to deal in a consistent fashion with changes of titles, mergers, divisions, etc.

Any statistically-minded reader will recognize that there is in many cases little significant difference between some of the citation frequencies that determine rank. Further, a single review article that might have cited any one of the journals a dozen times or more during the last quarter of 1969 would have exerted enough influence to change the rankings. But one has to accept this possibility in any ranking. The tail end of the "top fifty" will, therefore, vary somewhat each year. Longer lists would certainly give a more definitive picture, but we have set fifty arbitrarly as the limit we will publish here for the time being. Recognizing that there will be variations, we are publishing the lists primarily as an illustration of the potential value of the Journal Citation Index.2 Suffice it to say, nevertheless, that the essential

reliability of these brief lists has been confirmed by another sampling of the almost four million citations processed for the *Science Citation Index* during the whole of 1969.

To recapitulate, the Journal Citation Index gives this kind of information for every journal cited in the literature processed for the SCI. It shows how often each journal has been cited by other journals, and what those journals are. It shows also, as do these lists for JACS and JCP, what journals each source journal cites, how often, and for which years.

Much has been said about the presumed relationship between the physical chemist and the chemical physicist. The list of journals cited by JCP poses some interesting questions on that score. Although the Journal of Physical Chemistry appears fourth on the list, it is remarkable that the list contains so few other journals in physical chemistry. The Soviet Zhurnal Fizicheskoi Khimii (ZFK) is conspicuous by its absence. I should stress, however, that this could possibly be due to a bias in the choice of source journals covered by the SCI. The SCI certainly does not yet include some Soviet journals that may cite ZFK with sufficient frequency to improve its ranking on such a list.

Science and Nature appear on the list of journals most frequently cited by JACS and JCP. Indeed, their rank-

ings are almost identical, respectively 20th and 40th. Readers may remember, in contrast, that both *Nature* and *Science* appeared much higher (tenth and twelfth) on the list of journals cited by *Biochemistry*. *Nature* and *Science* have been historically more heavily oriented toward life sciences.

Perhaps the most interesting conclusion that can be drawn for the benefit of readers of Current Contents® is that the JCP cites, and is cited by, life science journals so infrequently that there appears to be small justification for its coverage in CC 7/Life Sciences. JCP unquestionably should be covered in CC/Physical and Chemical Sciences. The argument for coverage in CC/Life Sciences of the JCP may be that it is nevertheless so similar (in what it cites and what cites it) to journals like JACS, Journal of Physical Chemistry, and others. Many CC/Life Science readers continue to scan these journals regulary. However, the JACS does cite biochemical journals heavily. The Journal of Physical Chemistry, like the JCP, does not. The list and rankings of journals it cites most frequently are, more or less, identical with the list for JCP. If all this seems excessively complex, then perhaps you will understand why it is necessary to have the wisdom of Solomon, the persistence of Sisyphus, and the patience of Job in making journal selections for Current Contents.

- Garfield, E. What is the "core" literature of biochemistry as compared to the "core" of chemistry? Current Contents No. 5, p. 6-9, February 2, 1972.

JOURNALS MOST-CITED BY JACS

	Times	
Rank	Cited	Title
1.	14012	
2.	3068	*Journal of the American Chemical Society *Journal of the Chemical Society
2. 3.	1888	*Journal of Chemical Physics
3. 4.	1472	*Journal of Organic Chemistry
5.	1376	*Tetrahedron Letters
6.	884	*Inorganic Chemistry
7.	820	*Journal of Physical Chemistry
8.	708	*Chemische Berichte
9.	620	*Canadian Journal of Chemistry
10.	568	*Angewandte Chemie
11.	500	*Tetrahedron
12.	400	*Transactions of the Faraday Society
13.	302	*Annalen der Chemie
14.	292	*Journal of Biological Chemistry
15.	252	Bulletin of the Chemical Society of Japan
16.	252	*Helvetica Chimica Acta
17.	240	*Analytical Chemistry
18.	236	*Acta Crystallographica
19.	228	*Accounts of Chemical Research
20.	224	*Chemical Reviews
21.	224	*Journal of Organometallic Chemistry
22.	216	*Acta Chemica Scandinavica
23.	208	Nature
24.	204	*Quarterly Reviews
25.	188	Chemistry and Industry
26.	184	Molecular Physics
27.	180	* Recueil des Travaux Chimiques des Pays-Bas
28.	152	*Biochemistry
29.	144	*Proceedings of the National Academy of Sciences USA
30.	140	*Journal of Inorganic and Nuclear Chemistry
31.	120	*Bulletin de la Societe Chimique de France
32.	112	Organic Synthesis
33.	104	Proceedings of the Royal Society
34.	96	*Biochimica Biophysica Acta
35.	88	*Australian Journal of Chemistry
36.	84	*Biochemical Journal
37.	76	*Advances in Chemistry Series
38.	76	Discussions of the Faraday Society
39.	76	Progress in Physical and Organic Chemistry
40.	76	Gazzetta Chimica Italiana
41.	72	Photochemistry and Photobiology
42.	72	Science
43.	68	Advances in Physical and Organic Chemistry
44.	68	Advances in Organometallic Chemistry
45.	60	*Doklady Akademii Nauk SSSR
46.	60	Physical Review
47.	60	Zhurnal Obshchei Khimii
48.	56	*Comptes Rendus etc. de l'Academie des Sciences (Paris)
49.	56	Pure and Applied Chemistry
50.	56	Zeitschrift für anorganische und allgemeine Chemie

 $^{^{*}}$ In this list, and the one which follows, an asterisk indicates that the journal is among the 50 journals which cite JACS or JCP most frequently.

JOURNALS MOST-CITED BY JOURNAL OF CHEMICAL PHYSICS

	Times	- 111
Rank	Cited	Title
١.	14396	*Journal of Chemical Physics
2.	2728	*Physical Review
3.	1284	*Journal of the American Chemical Society
4.	980	*Journal of Physical Chemistry
5.	872	Proceedings of the Royal Society (London)
6.	540	*Transactions of the Faraday Society
7.	508	*Molecular Physics
8.	496	*Physical Review Letters
9.	436	*Journal of the Chemical Society
10.	344	*Acta Crystallographica
11.	316	Physica
12.	312	Zeitschrift für Physik
13.	308	*Journal of Physics
14.	308	*Journal of the Physical Society of Japan
15.	304	*Journal of Molecular Spectroscopy
16.	296	Reviews of Modern Physics
17.	272	and the contract of the contra
	264	*Canadian Journal of Physics
18.		Chemical Physics Letters
19.	256	*Spectrochimica Acta
20.	248	Nature
21.	244	*Journal of Applied Physics
22.	240	*Optika i Spektroskopiya
23.	236	*Inorganic Chemistry
24.	232	*Canadian Journal of Chemistry
25.	232	Review of Scientific Instruments
26.	220	Journal of Mathematical Physics
27.	220	*Zeitschrift für Naturforschung
28.	212	Discussions of the Faraday Society
29.	196	Journal of the Optical Society of America
30.	184	*Journal of the Physics and Chemistry of Solids
31.	164	Bulletin of the American Physical Society
32.	156	Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki
33.	148	*Bulletin of the Chemical Society of Japan
34.	144	Advances in Chemical Physics
35.	144	Proceedings of the National Academy of Sciences USA
36.	140	Rarefied Gas Dynamics. Proc. Internat. Symp.
37.	140	*Journal de Chimie Physique
38.	124	Journal of Research of the National Bureau of Standards
39.	116	*Fizika Tverdogo Tela
40.	112	*Surface Science
41.	104	Advances in Chemistry Series
42.	104	*Chemical Reviews
43.	100	*Physics Letters
44.	100	Science
45.	96	Annual Review of Physical Chemistry
46.	96	*Theoretica Chimica Acta
47.	92	*Comptes Rendus etc. de l'Academie des Sciences (Paris)
48.	92	Solid State Physics
49.	88	*Berichte der Bunsengesellschaft für Physikalische Chemie
50.	88	Annalen der Physik
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