

# Trends in Accessibility of Chemistry Journals

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**Abstract.** The paper examines different strategies in providing free access to online scholarly chemical publications. The scope of accessibility is illustrated by the analysis of the content dynamics in the directory *Free Full-Text Journals in Chemistry* that comprises links to online journals with at least one-year free content. Two snapshots taken in 2004 and 2005 have shown that about half of the journals increased amount of their free content, mainly by addition of current issues in 2004-2005. In most cases, URLs of the sources were stable through the period investigated. Only 5 % of journals disappeared from the Web or became fully paid.

A recent report [1] composed on behalf of the European Commission examines the scientific publication system in Europe. The report confirms the essential role of digital journals and emphasizes the need for a wider public access to the electronic primary literature.

In this paper we analyse the scope and tendencies in accessibility of chemistry journals from the user's point of view. The main user's criterion for the accessibility is "free vs. paid", while the sources of free access are different (Open Access initiative, publisher's promotional strategy, government's funding, etc.).

A reader can presently retrieve a lot of free peer-reviewed journals from the Web. Researchers in life sciences are in the most favourable position. A number of web archives contain hundreds of biomedical journals with wide year coverage of free content. The major examples are the following information providers:

**HighWire Press** (<http://highwire.stanford.edu/lists/freeart.dtl>),

**PubMed Central** (<http://www.pubmedcentral.nih.gov/>),

**BioMed Central** (<http://www.biomedcentral.com/>).

A few scientific societies provide high-impact journals free to public starting from old volumes, sometimes from the first issue. One of the leaders of this kind is *Journal of Biological Chemistry* (<http://www.jbc.org/>) — full-text papers at *JBC Online* site are free from 1905 excepting the current year.

All these information sources are of interest to chemists also, especially to those who work in the field of bio- and organic chemistry. Moreover, we see the first attempts to broaden the subject limits of the above archives. A good example is *BioMed Central* that started to host *Beilstein Journal of Organic Chemistry* and *Geochemical Transactions* in 2004-2005.

The major part of highly cited international chemical journals is produced by a moderate number of publishers who demonstrate diverse policies in providing free access to papers.

Elsevier's site **ScienceDirect** (<http://www.sciencedirect.com/>) is a valuable centre of bibliographic and abstract information of its own. Furthermore, a non-subscriber may always find there a considerable portion of full-text content ranging from entirely open journals (e.g. *Combinatorial Chemistry*) and extensively open (e.g. publications of *Cell Press*) to complimentary single volumes or issues. Users appreciate Elsevier's frequent promotional campaigns of temporary unrestricted access to separate titles or even subject libraries. The latest example is the *ScienceDirect China Collection* – a series of important Chinese journals previously not widely disseminated outside China and now available free until December 2006 from *ScienceDirect* site. A great number of articles published by Elsevier journals are also available free to non-subscribers from authors' personal and institutional websites, due to the publisher's permission to post final versions of accepted articles prior to publication [2].

Springer's strategy in providing free access is similar in general to that of Elsevier. Normally there are only a few free chemistry journals at the **SpringerLink** site

(<http://www.springerlink.com/>) but occasionally the publisher announces trial periods. For instance, in April 2006 all journals of *Chemistry and Materials Online Library* have become available to the public for a two-months period.

In 2005 the publisher started *Springer Open Choice* program that offered authors to have their journal articles made available with open access in exchange for payment of a fee [3]. The initiative is expected to increase the amount of free-to-user content at SpringerLink.

Another leading publisher Wiley provides mainly paid content. Every quarter free trials of separate issues are announced at **Wiley InterScience** (<http://www3.interscience.wiley.com/>) site. The publisher also gives free access to selected articles at Wiley's specialized portals **separationsNOW.com** (<http://www.separationsnow.com/>) and **spectroscopyNOW.com** (<http://www.spectroscopynow.com/>) upon registration. Wiley rarely opens larger information blocks; the pleasant exclusion is the actual offer for qualifying institutional customers to register for complimentary access to new journals published in 2006.

**Royal Society of Chemistry** (<http://www.rsc.org/Publishing/Journals/Index.asp>) grants free access to a limited number of papers during one month following the date of the publication. The main free feature of this publisher is the complimentary access to back volumes of all RSC journals starting from 1997 with the embargo period of 3 calendar years (in 2006 free archives contain issues published since 1997 till 2003).

**American Chemical Society** (<http://pubs.acs.org/>) grants access to sample issues, usually first issues of a current year, extensive electronic supplements to printed journals, first pages of old papers and limited number of selected latest articles. Few years ago there was a good tradition to open a set of journals temporarily during the National Chemistry Week, but the initiative has diminished presently to opening a set of articles. On the other hand, in 2006 ACS has announced a more moderate policy concerning digital copies of published articles. Authors are entitled to post links to their articles on personal sites; 50 free downloads of each publication are allowed during the first year after publication, and later the access is unrestricted [4].

All of **Bentham Science's** (<http://www.bentham.org/>) journals published in 2000–2002 are available free until the end of 2006. Also, the publisher offers academic and corporate institutions a 2-month trial to the full journals contents.

**Institute of Physics Publishing** (<http://www.iop.org/EJ/>) demonstrates another kind of complimentary access strategy: this publisher grants free access to all its journals during a 30-day period after the publication date.

Thus, the common feature of the above-mentioned providers is the complimentary access to the selected fractions of published data, but the strategies of the free access are different for each publisher.

A number of national and regional organisations maintain online information centres with extensive full-text contents.

**J-STAGE** (<http://www.jstage.jst.go.jp/browse/>) is a journal aggregator operated by Japan Science and Technology Agency and it makes publications issued by Japanese academic institutions available to the public. J-STAGE comprises about 300 free titles (published in English and Japanese) in different subjects, chemistry inclusive. The time coverage depends on the journal, but full texts of most publications are available for few last years. The database is growing permanently; new titles and new volumes are added every month.

**SciELO** (<http://www.scielo.org/>) provides access to full-text journals of Latin America published in English, Spanish, or Portuguese; the coverage varies for different titles in the period from 1995 till 2006. Current issues are added to the database shortly after publication.

**Directory of Open Access Journals** (<http://www.doaj.org/>) collects and organizes free resources from worldwide and is not limited to particular languages. At present it contains metadata information on more than 2000 titles in different subjects and also a searchable database of full-text journals (10 of them are chemistry titles). To be included in the directory a journal must comply with regulations of Open Access Initiative, particularly all its content must be freely available without any embargo period.

Numerous national chemical societies of Central Europe and Asia promote their research on the Web. Their online journal archives are thoroughly maintained and usually have broad time coverage. The leaders of this group provide online access starting from volume 1: *Current Science* of the Indian Academy of Sciences (published since 1932), *Journal of the Korean Chemical Society* (published since 1949).

Links to free national journals can be found on the corresponding societies' web pages, e.g. **Indian Academy of Sciences - Journals** (<http://www.ias.ac.in/pubs/journals/>), **Chinese Science Digital Library** (<http://chemport.ipe.ac.cn/ListPageE/L36.shtml>).

There is a small number of chemistry e-journals that have no printed counterparts. The most successful project in this segment of publishing, apart from BioMed Central, is being implemented by **MDPI** (<http://www.mdpi.org/>) since 1996. For an extended period all papers in MDPI's journals were free to readers. At present the publisher uses a two-tier system: Open Access (papers paid by authors and free for readers) and non-Open Access (papers free for authors and paid by readers). The mode of access to every article is indicated in Table of Contents of an issue. MDPI's strategy has an interesting distinctive feature — if a non-Open Access paper is paid by readers ten times, it turns to an Open Access paper.

Most of the rest chemical e-journals are completely free to the user.

There are numerous metasites with links to chemical journals but only few of them provide indication on free content in their referenced sources.

**Electronic Journals Library** (<http://rzblx1.uni-regensburg.de/ezeit/>) of the Regensburg University is one of the best starting points in searching for journal sites; paid and completely free titles are marked by different signs in this directory. Fragmentary data regarding journals accessibility may be found also in a smaller database **Selected Scientific Journals** (<http://www.genebee.msu.su/journals/chemist.html>).

Accessibility of the major part of online chemistry journals is subjected to a mixed paying policy: the publisher grants free access to a selected set of volumes (issues) while the admission to the rest of the database is open just to subscribers or paying visitors. Quite often the information on the availability status is hidden deeply in the publisher's website pages. A user needs a clear reference to estimate the range of free online sources for efficient work with literature.

Vast information on fully and partly free chemical journals is available in our directory **Free Full-Text Journals in Chemistry** (<http://www.abc.chemistry.bsu.by/current/>) (Fig. 1).

Back Search Address <http://www.abc.chemistry.bsu.by/current/fulltext.htm>

**Free Full-Text Journals in Chemistry**  
**Part A. Permanently available chemical journals**

[See also: Part B. Trials and temporarily available chemical journals](#)

[Links to this site](#)  
[Рус версия](#)

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z | [Misc](#) | [Educational](#) | [Journals in Russian](#) | [New](#) | [XML](#)

[AAPS Journal](#) - Articles (2004-present) [HTML, PDF], Accepted Papers [PDF] ||| Formerly AAPS PharmSci

[AAPS PharmSci](#) - Articles (1999-2004) [HTML, PDF] ||| American Association of Pharmaceutical Scientists

[AAPS PharmSciTech](#) - Articles (2000-present) [HTML, PDF], Accepted Papers [PDF] ||| American Association of Pharmaceutical Scientists

[Academic Open Internet Journal](#) - Articles (2000 - present) [HTML, PDF] ||| International e-journal, Bulgaria

Fig. 1. *Free Full-Text Journals in Chemistry* website.

The directory consists of two sections: Part 1. Permanently available journals [5] and Part 2. Temporarily available journals [6].

Part 1 comprises links to journals that satisfy the following criteria:

- publisher's recognition as 'peer-reviewed';
- one-year at least free full-text content, or extensive free supplements to printed versions of papers;
- chemistry or chemistry-related subject coverage;
- English (for some journals Russian) language of articles.

Part 2 contains announcements of trials and links to the temporarily available chemical journals.

Titles in Part 1 are arranged in the alphabetical order. Publications in Russian are listed on a separate page.

Every record comprises: journal title with a link to Home Page or list of volumes; indication of free material type (article, supplement, preprint, etc.); time coverage (period of the free access); format of papers (HTML, PDF, etc.); name of the publisher and other appropriate information.

New titles are added to the directory twice a month, and once a year (in August — September) we thoroughly verify the whole content.

The directory contained 244 titles in September 2004, 300 titles in September 2005 and 350 titles in April 2006. Though we do not pretend to a comprehensive coverage of all presently available free full-text online chemistry journals, we suppose the directory represents the present state in the accessibility to full-text chemical and chemistry-related journals.

For the evaluation of tendencies in the accessibility, two snapshots of the directory status (September 2004 and the same journals in August 2005) have been analysed.

#### Characteristics of the initial set

Total number of journals	244	Language of publication:	
with full-text papers	208	English	217
with free supplements only	36	Russian	27

##### a) Permanence of access.

During 12 months of the period investigated the initial set of journals diminished by 13 titles (5.3 %):

- 7 journals (2.9 %) changed the access mode and became fully paid;
- 6 journals (2,4 %) disappeared from the Web completely.

In most cases, URLs of the remaining titles were stable, but 37 (15 %) journals changed their addresses:

- changes of 10 (4.1 %) URLs did not effect the accessibility, because the servers automatically redirected users to new addresses;
- for 20 (8.2 %) URLs the effect was moderately negative, as users were redirected to the site's standard "Not Found" page, where they could look for a path to the journal's Home Page;
- in 7 (2,9 %) cases domain names changed, and users had to perform special searches in order to find the new journal's site.

##### b) Free content by year of publication.

Fig. 2 illustrates the total number of journals with free access to publications of a given year (2004 and 2005 snapshots).

- Excepting the years of investigation, the total accessibility to the free content differed insignificantly in 2004 and 2005.
- A small number of journals provided access to papers published before 1995.
- The growth of accessibility to chemistry papers starts in 1996 with the peak in 2001-2002 years of publication.

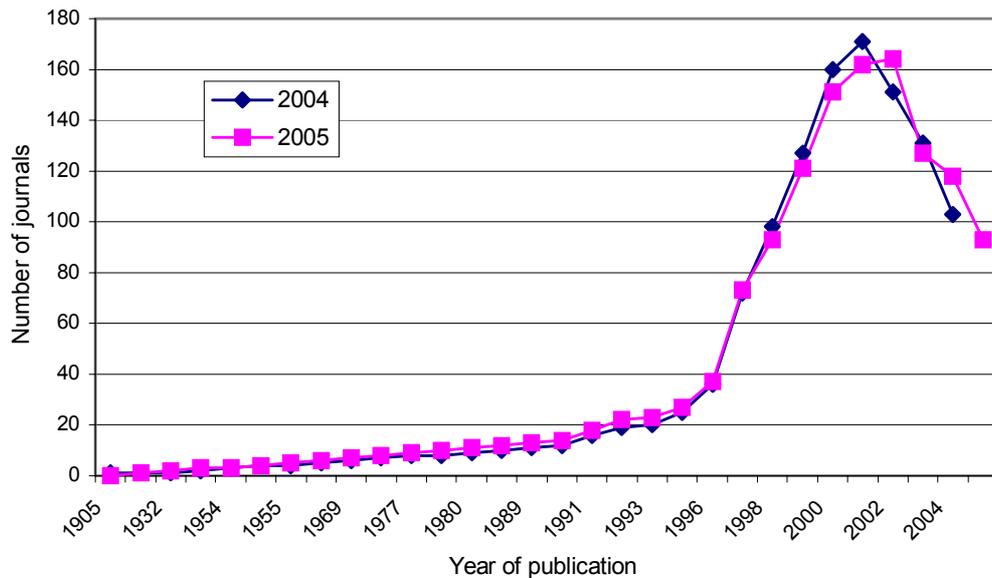


Fig. 2. Free content by year of publication

c) Changes in coverage.

- During 12 months of the period investigated 128 (52.5 %) journals increased their presence on the Web:
  - 112 (45.9 %) journals by 1 year;
  - 6 (3.3 %) journals by 2 years;
  - 4 (1.6 %) journals by 3-7 years;
  - 4 (1.6 %) journals by 23-67 years.
- The major part of the increase was caused by additions of issues in 2004-2005. A much smaller part of the increase in the beginning of the 2000's did not compensate the decrease in coverage that resulted from the journals becoming payable or disappearing from the Web.
- 11 (4.5 %) journals have offered extra back volumes.

d) Time range of free access.

Journals open free archives of different time lengths, typically less than 10 years (Fig. 3). In 2004 the most common time range of free access was equal to 5 years and in 2005 it increased to 6 years.

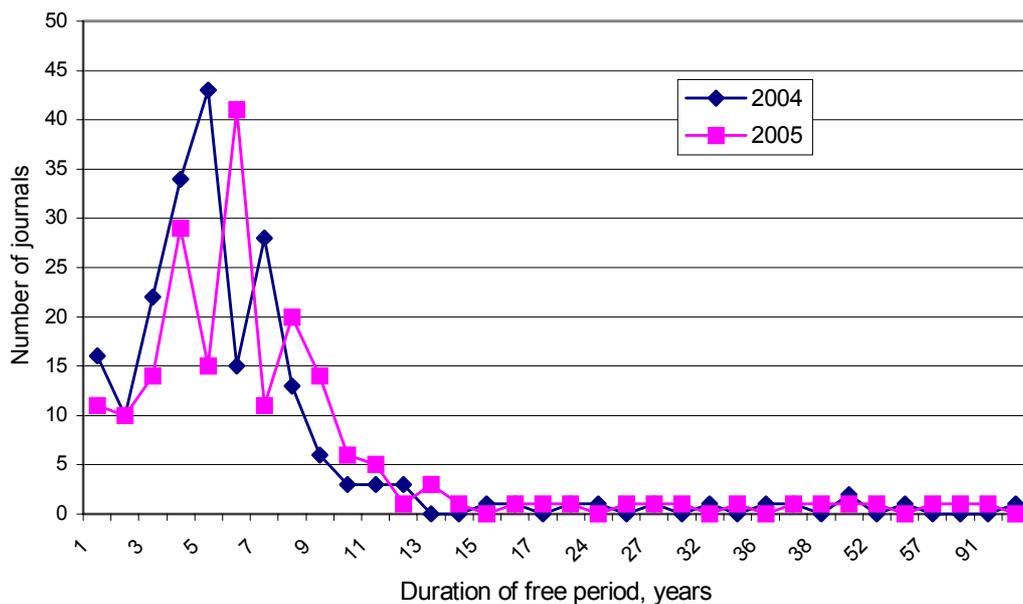


Fig. 3. Time range of free access

The comparison of 2004 and 2005 sets of journals reveals a steady but slow growth of existing free information sources. Scientific non-profit societies were the main contributors to these changes, while the major journal publishers kept their publishing policy less changeable.

New efforts as those recommended in the European Commission report [1] are needed to stimulate wider dissemination of free scientific content by business-related publishers.

## References

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4. ACS Articles on Request Policy. <http://pubs.acs.org/reprints/policy.html>.
5. Free Full-Text Journals in Chemistry. Part 1. Permanently available journals. <http://www.abc.chemistry.bsu.by/current/fulltext.htm>.
6. Free Full-Text Journals in Chemistry. Part 2. Temporarily available journals. <http://www.abc.chemistry.bsu.by/current/trial.htm>.