ARKIVOC: A Hard Copy Journal of Organic Chemistry Freely Available on the Web

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Background

ARKIVOC (Archive for Organic Chemistry) was conceived in an attempt to alleviate a number of adverse trends in the practice and publication of organic chemistry, which are particularly acute in countries of the second and the third world. These include the following:

- Increasing difficulty for researchers in accessing the primary chemical literature because of the increasing cost of journals. The costs of some of the leading journals of organic chemistry are given in Table 1. Even in Western Europe and North America, and in major universities, libraries face severe difficulties with their budgets.
- Increasing difficulties for authors to publish their work in journals that are widely available. The pressure on library budgets caused by point 1 above has recently led to the disappearance (often by amalgamation) of many second rank (and some first rank!) journals. The amalgamated journals are accepting only the best, the most novel of research that is carried out. Other sound work is now often published in a third rank journal (e.g., a university journal with low distribution) or not at all.
- Increasing needs for equipment, starting materials, infrastructure, etc., which cause shortages of funds for actual research. This point is so self-evident that no further explanation is required.
- The potential for random testing by high throughput screening of compounds prepared during research projects with completely different objectives. Several commercial organizations are already collecting specimens worldwide and selling them to pharmaceutical companies and other interested organizations. While these efforts are undoubtedly of considerable value to the recipient organizations, the proportion of the gross income returned to the producers of the compounds is often a fraction of the selling price.

Table 1 Prices (in USD for 2000) and pages per annum (approximate) of leading journals in organic chemistry.

Journal of Organic Chemistry	1626/10,000
Organic Letters	2403/4000
Journal of Chemical Society, Perkin I	1843/4000
Journal of Chemical Society, Perkin II	1535/2500
Tetrahedron	11,624/9000
Tetrahedron Letters	8859/10,000
Synthesis	1099/1800
Synletters	702/1800
European J. of Organic Chemistry	2698/5000

Notes: Page numbers are given for the year 2000. Prices reflect costs for year 2000 in countries other than that of the producer for an institutional subscription. In making price comparisons, the different sizes of pages and densities of printing need to be taken into consideration, which has not been done.

Strategy

The not-for-profit Archive for Analysis and Testing Foundation (ARKAT) was created in an attempt to address simultaneously the four points outlined above. We publish and circulate on the Internet a new freely accessible journal: ARKIVOC (Archive for Organic Chemistry). The cost of publishing ARKIVOC on the web will be met in a number of ways. We solicit contributions from companies and granting organizations. We hope to produce and sell hard copy issues of the journal at a later date. We run the Florida Heterocyclic conferences (see p. 184, 3rd column) as an income-producing activity to support ARKIVOC.

ARKIVOC Submission and Processing of Manuscripts

All correspondence is handled electronically. After experimenting with a more idealistic system, we rapidly moved to traditional anonymous refereeing. Thus, all manuscripts are forwarded electronically to our coordinating editor, A. John Boulton (detailed instructions are available on the Web at www.arkat-usa.org), who assigns two referees, a technical editor, and a scientific editor to deal with each manuscript. The corresponding author is informed of the name of the scientific editor. The referees and the technical editor are sent the manuscript and name of the scientific editor to whom

they are asked to send their reports directly. The scientific editor is sent the manuscript and the names of the referees and the technical editor. If reports are not received within two weeks, the scientific editor reminds the referee. After receipt of the referees' and the technical editor's reports, the scientific editor can directly accept or reject the paper. Normally, the scientific editor will communicate the referees' and technical editor's reports (anonymously) to the author, who will be asked to modify the paper as necessary. At any time, the scientific editor may correspond further with the original or additional referees or with the technical editor.

At present, our Editorial Board of Referees consists of 228 scientists from 46 countries covering six continents. The Chairman of this Board (George Newkome) maintains general contact with members.

ARKIVOC now has eight scientific editors, seven of whom handle general manuscripts; two are in the United Kingdom (Chris Ramsden and Tom Gilchrist), two are in continental Europe (Mike Begtrup and Joachim Schantl), two are in the United States (Alan Marchand and Paul Krapcho), and one is in India (G. S. Subba Rao). The eighth scientific editor (Eric Scriven) deals with reviews and accounts. Spiros Grivas and Ramaiah Muthyala are our technical editors.

Accepted papers are forwarded by scientific editors to the Publishing Editor (Eric Scriven), and, under his direction, the manuscripts are given a uniform appearance and readied for online display and search. HTML and PDF format manuscripts are prepared for easy viewing, downloading, and printing.

Electronic and Hard Copy Publication of ARKIVOC

Issues of ARKIVOC are released onto the web site electronically as soon as they are ready. The electronically released issues are formatted precisely for convenient downloading and binding; thus, each issue has an appropriate cover page, title page, and contents page. There are no restrictions on (or charges for) downloading individual papers or complete issues of ARKIVOC for scientific research purposes, for distribution throughout the downloading organization, or for binding and placing them in a library. However, any reproduction of ARKIVOC for sale or for transfer to another commercial organization requires permission from the ARKAT USA Foundation as publisher.

In due course, we hope to provide (for a fee) copies of the journal issues ready for binding for the convenience of organizations (or individuals) who so prefer.

Scientific Scope of ARKIVOC

ARKIVOC accepts submissions dealing with all branches of organic chemistry, including physical organic, bioorganic, and organic materials chemistry. The prime criteria for acceptance of manuscripts by ARKIVOC are soundness and proper characterization of all compounds described (for detailed instructions, see Web site). In addition to original papers, ARKIVOC also publishes reviews and accounts (shorter, focused overviews).

An important objective of ARKIVOC is to ensure the permanent archival availability of organic chemistry research results worldwide. Because of our cost-free availability, ARKIVOC offers potentially wider dissemination of organic chemical results than existing journals. ARKIVOC, which has no page charges or costs for authors, offers equal opportunities for chemists worldwide to make their results available to the widest possible audience.

Commemorative Issues of ARKIVOC

A secondary objective of ARKIVOC is to provide the opportunity to recognize the achievements of chemists by means of commemorative issues. Such commemorative issues are well known, but the chemists so honored currently tend either to come from a small group of developed countries or to receive dedicated issues in journals of relatively low circulation.

ARKIVOC seeks to honor distinguished chemists worldwide, particularly those whose contributions have deserved wider recognition. Instructions for suggesting names and the procedure for commemorative issues are given on the web site. Suggestions can be made to Alan Katritzky, Chair of the Commemorative Issues Committee of ARKIVOC.

Progress with ARKIVOC

Substantial progress has been achieved with our journal. Volume 1, published during 2000, comprises six issues containing 90 papers and totaling over 1000 pages.

Our original objective of 100 papers totaling 1000 pages in year 2000 has thus been reached. We hope to achieve 200 papers with 2000 pages in 2001. It is interesting to compare this success with the early years of *Tetrahedron*. *Tetrahedron's* first three years were 1957 (384 pages for USD 17), 1958 (1138 pages for USD 51), and 1959 (1038 pages for USD 51).

Indexing and Abstracting of ARKIVOC

Each issue of ARKIVOC carries graphical abstracts of all papers in that issue. It is planned that the text and structures in ARKIVOC will be searchable electronically using authors' names and keywords. *Chemical Abstracts* and *Current Chemical Contents* are already abstracting ARKIVOC regularly.

Policy and Direction of ARKIVOC

ARKAT USA is managed by its Directors, in accordance with goals and objectives set out in its charter. The promotion of ARKIVOC is one of ARKAT USA's primary objectives.

ARKIVOC has its own Control Board (Chair:

Charles Rees; Secretary: Chris Ramsden) consisting of the Coordinating Editor, the Scientific Editors, the Technical Editors, Chair of the Editorial Board of Referees, and Chair of the Commemorative Issues Committee. A steering committee reporting to the ARKAT USA Board oversees day-to-day activities of ARKIVOC and the Flohet conferences. Meetings of the steering committee and available ARKIVOC Control Board members take place (often at chemical conferences) at irregular intervals around the world; e.g., in 2000 such meetings were held in London (2), Florida, and Alexandria (Egypt).

Control Board members regularly send details of progress to the Board Secretary, who coordinates these into a monthly report to all Control Board members.

Other Activities of ARKAT USA

ARKAT USA exists to help scientists in general, and chemists in particular, throughout the world and particularly in developing countries. Present activities and those under consideration include the following:

- Organization of conferences.
- Provision of quality online educational resources to students, to encourage interactive learning, help them with their course work, and alleviate the acute shortage of qualified teachers for science subjects.
- Publishing useful reference materials for practicing chemists. The first such publication, a dictionary of named reactions, compiled by John Boulton and Purabi Devi, is now available in part from the ARKAT USA Web site.

All those wishing to publish with ARKAT should visit the ARKAT USA Web site for details.

We Need Your Help!

We hope that you will agree that ARKAT USA and the ARKIVOC journal offer real help to chemists worldwide. If so, please help us in some of the following ways (more details at www.arkat-usa.org):

- Submit a manuscript to our coordinating editor.
- Read and cite papers already published in ARKIVOC.
- Ask your library to download and bind the journal (no fee).
- Spread the word about ARKIVOC among your friends.
- Send comments or suggestions to any of the authors of this article.
- Please give ARKAT USA your support in our efforts to raise funds for these projects.
- If you are affiliated with a corporation, please send us details of whom we may contact for a financial donation and to discuss advertising and product promotions on the ARKAT Web site.

The inception of ARKAT USA and ARKIVOC has been made possible by the unpaid efforts of the ARKAT USA directors and the ARKIVOC editors and referees and by an initial personal financial gift. We are now working to put the organization on a self-supporting basis, and we believe that this goal can, indeed, be achieved to create a permanent ongoing organization for the benefit both of chemistry and of humanity worldwide.

"Heavy Metals"—A Meaningless Term

Dr. John H. Duffus (Director, Edinburgh Centre for Toxicology, 43 Mansionhouse Road, Edinburgh, EH9 2JD, Scotland, UK; E-mail: j.h.duffus@btinternet.com), Chairman of the IUPAC Commission on Toxicology (VII.C.2), has submitted the article that appears below.

Introduction

Over the past two decades, the term "heavy metals" has been used increasingly in various publications and in legislation related to chemical hazards and the safe use of chemicals. It is often used as a group name for metals and semimetals (metalloids) that have been associated with contamination and potential toxicity or ecotoxicity. At the same time, legal regulations often specify a list of heavy metals to which they apply. Such lists may differ from one set of regulations to the other, or the term may be used without specifying which heavy metals are covered. In other words, the term "heavy metals" has been used inconsistently. This practice has led to general confusion regarding the significance of the term. The inconsistent use of the term "heavy metals" reflects inconsistency in the scientific literature. It is, therefore, necessary to review the usage that has developed for the term, paying particular attention to its relationship to fundamental chemistry. Without care for the scientific fundamentals, confused thought is likely to prevent advances in scientific knowledge and to lead to bad legislation and to generally bad decision-making.

A Review of Current Usage of the Term "Heavy Metal"

Table 1 lists all the current definitions of the term "heavy metal" that the author has been able to trace in scientific dictionaries or in other relevant literature. It must be noted that frequently the term has been used without