

## Notes on Scientific Writing

Excerpted from: *The ACS Style Guide*; Dodd, J.S. Ed.; The American Chemical Society; Washington, D.C., 1986. With some modifications by S.E. Van Bramer.

### *Writing Style*

Short declarative sentences are easiest to write and easiest to read, and they are usually clear. However, too many short sentences in a row can sound abrupt or monotonous. It is easier to start with simple declarative sentences and then combine some of them than to start with long rambling sentences and then try to shorten them.

By all means, you should write in your own personal style, but keep in mind that scientific writing is not literary writing. Scientific writing serves a completely different purpose from literary writing, and it must therefore be much more precise. Some specific hints follow.

Stick to the original meanings of words: don't use a word to express a thought if such usage is the fourth or fifth definition in the dictionary or if such usage is primarily literary. Examples are using "since" when you mean "because", and "while" when you mean "although". Many words are clear enough when you are speaking because you can amplify your meaning with gestures, expressions, and vocal inflections-but when written, they're clear only to you.

Avoid slang and jargon.

Use strong verbs: they are essential to clear, concise writing.

Use the active voice whenever possible. It is usually less wordy and unambiguous.

#### *Poor*

The fact that such processes are under strict stereoelectronic control is demonstrated by our work in this area.

#### *Better*

Our work in this area demonstrates that such processes are under strict stereoelectronic control.

Be brief. Wordiness usually adds nothing but confusion, and the resulting paper is very expensive to typeset and to print.

First person is perfectly acceptable **where it helps keep your meaning clear.**

Jones reported xyz, but we found...  
Our recent work demonstrated...  
For these reasons, we began a study of...

However, phrases like "we believe", "we feel", "we concluded", and "we can see" are unnecessary, as are personal opinions.

Try not to shift verb tenses within the same paragraph and section. However, the tense should change from section to section. Present and past tenses are correct in the introduction: "Absolute rate constants for a wide variety of reactions are available. Jones reviewed the literature and gathered much of this information". Simple past tense is correct for describing your procedures: "The solutions were heated to boiling", "the spectra were recorded". Then use **present tense to discuss your results and conclusions.**

### *Abstract Section*

Many publications require that an informative abstract accompany every paper. For a research paper, the abstract should summarize the principal findings: for a review paper, the abstract should describe the topic, the scope, the sources reviewed, and the conclusions. You should write the abstract last to be sure that it reflects accurately the content of the paper.

The purposes of the abstract are to allow the reader to determine the nature and scope of the information given in the paper and to allow editors to pinpoint key features for use in indexing and eventual retrieval. The abstract must contain sufficient information to allow a reader to decide whether to read the whole paper. The abstract should provide adequate data for generating index entries. Although an abstract should not be a substitute for the article itself, it must be complete enough to appear separately in abstract publications. Often, authors' abstracts are used directly in *Chemical Abstracts*.

In the abstract you should briefly state the problem or the purpose of the research when that information is not adequately contained in the title, indicate the theoretical or experimental plan used, accurately summarize the principal findings, and point out major conclusions. Include chemical safety information when applicable. Do not add to, evaluate, or comment on conclusions in the text.

The abstract should be concise and self-contained. The optimum length could be two sentences: it could be many more, depending on the subject matter and the length of the paper. Use meaningful nomenclature: that is, use standard systematic nomenclature where specificity and complexity require, or use trivial nomenclature where it will adequately and unambiguously define a well-established compound.

Do not cite references, tables, figures, or sections of the paper. You may refer to equations or structures presented in the body of the paper if they are on a single line and can readily be incorporated when the abstract is used in the secondary literature (e.g., *Chemical Abstracts*). Do not include equations and structures that take up more than one line.

Use abbreviations and acronyms sparingly and only when necessary to prevent awkward construction or needless repetition. Define abbreviations at first use in the abstract (and again at first use in the text).

## *Results Section*

Summarize the data collected and the statistical treatment of them. Include only relevant data, but give sufficient detail to justify your conclusions. Use equations, figures, and tables only where necessary for clarity and conciseness.

## *Discussion Section*

When discussing your results, be objective. Point out the features and limitations of the work, and interpret and compare your results. Relate your results to the original purpose in undertaking the project: Have you resolved the problem? What exactly have you contributed? Briefly state the logical implications of your results. Suggest further study or applications if warranted.

You can present your results and discussion as two separate sections or you can combine them into one section if it is more logical to do so.

*For Grammar Style and Usage see any standard style guide*

## *Use nonsexist language*

Instead of "man" use "people", "humans", "human beings", or "human species", dependent upon your meaning.

Instead of "he" and "his", use plural ("they" and "theirs") or first person ("we", "us", and "ours"). You can delete "his" and replace it with "the" or nothing at all. "His or her", if not overused, is not terribly unpleasant. You can also recast the sentence to avoid any conflict.

## *References*

References are usually cited as endnotes with the text marked with a superscript<sup>1</sup>, in parentheses (1), or by author and date (Jones, 1987).

Journal Articles are given as follows:

Van Bramer, S.E.; Johnston, M.V. *Anal. Chem.*, **1990**, 62, 2639-2643.

Books are as follows:

Willard, H.H.; Merritt, L.L.; Dean, J.A.; Settle, F.A. *Instrumental Methods of Analysis*; Wadsworth: Belmont, CA, 1988, p 260.