

Safety Policies of Peer-Reviewed Journals

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Introduction

- Safety mentions are uncommon in journals
- Examined peer-reviewed chemical journals for safety information
 - 726 journals
 - Varying location of requirement
- Determined safety guidelines effectiveness
 - 100 articles in synthetic journals from 6 publishers

A Quiz

- Are you and author of a peer-reviewed publication?
- Have you read the Journal's Guidelines for Authors before preparing the publication?
- Have your read the Ethics Guidelines?

Publication Safety Requirements

- Journal websites provide information to potential authors
- Safety requirements found in two locations:
 - Journal Guidelines for Authors
 - Inform author of journal scope and content
 - Ethics Guidelines
 - Values and standards of the publisher

Evaluating Journal Safety Requirements

- 726 chemistry journals:
 - Impact factor placing them in Top 40
 - All American Chemical Society (ACS)
 - All Royal Society of Chemistry (RSC)
 - Majority of Springer, Elsevier, Wiley and Taylor & Francis
- Total of 28 publishers

Search for Safety Information

- Searched journal guidelines for authors and ethics guidelines for “safety keywords”:
 - Caution
 - Hazard
 - Danger
 - Safety

Location of Safety Information

- Journal Guidelines for Authors
 - 59 of 726 journals included a safety keyword (8%)

	ACS	RSC	Springer	Elsevier	Wiley	Taylor & Francis	DeGruyter	Other Publishers
Total number of journals	48	38	132	221	148	82	29	28
Journals with safety keywords	39	0	0	10	5	0	0	5
Journals without safety keywords	6	38	132	211	143	82	29	23
Other	3	0	0	0	0	0	0	0
Percentage of journals mentioning a safety keyword	83%	0%	0%	5%	3%	0%	0%	18%

The Authors Guide contains a majority of the information used by authors

- Only the ACS journals has a majority (83%) in which the Author's guide mentions safety.
- 39 journals mention safety in the Author's Guide.
- 56% specify safety should be mentioned in the Experimental section.
- 1 journal (3%) specifies the cover letter
- 41% do not specify where safety should be mentioned

Safety in Author Guidelines

- The majority state
- “Precautions for handling dangerous materials of performing hazardous procedures must be explicitly stated.”
- “Unusual or new hazards should be clearly identified.”
- A few require the word “Caution” followed by a brief description.

- Ethics Guidelines containing safety keyword
 - All ACS, RSC, Taylor & Francis, and 98% Elsevier

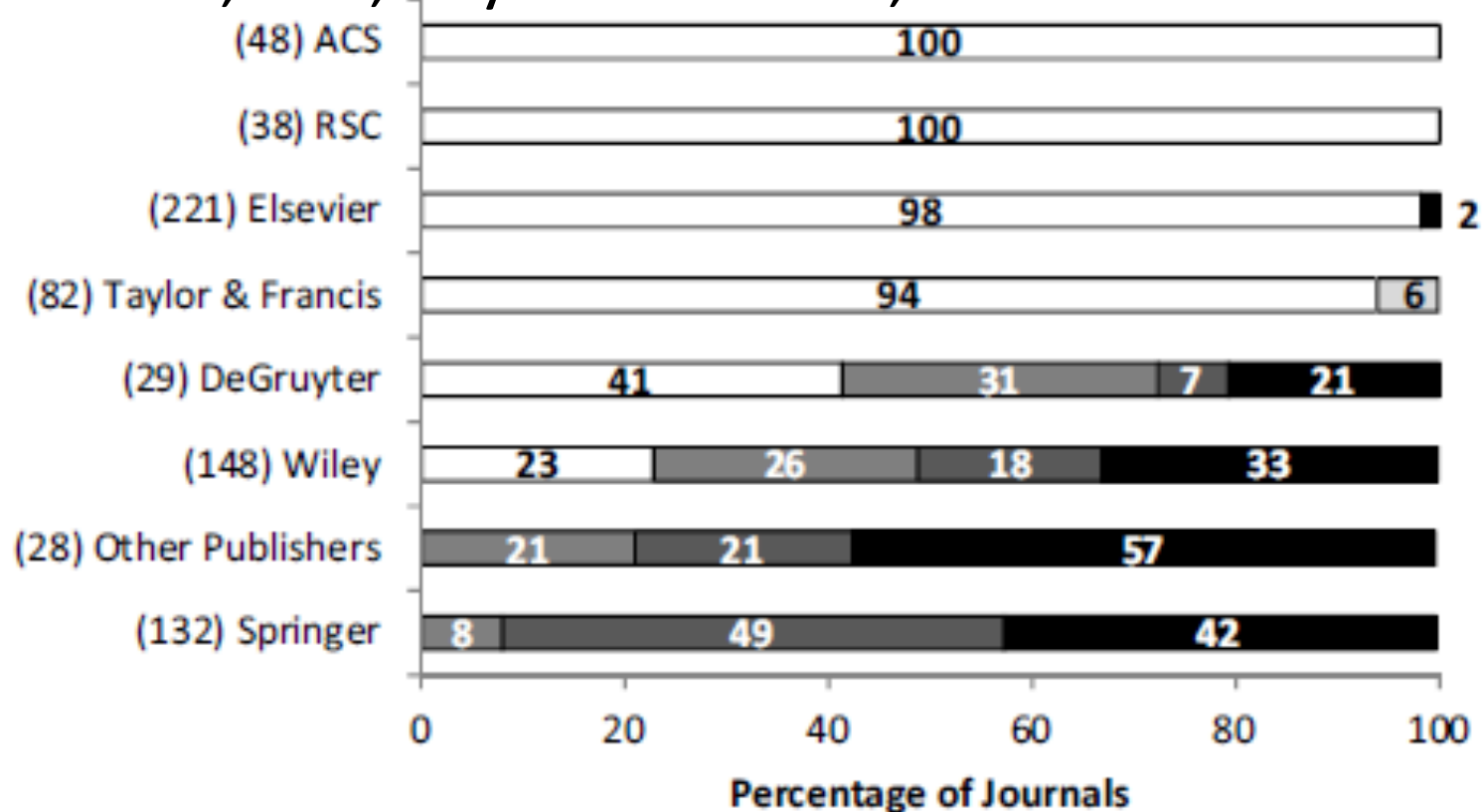


Figure 1. Distribution of safety keywords in journal ethics guidelines with numbers of journals in parentheses. Separate ethics statement that contains a safety keyword. Separate ethics statement that contains a safety keyword but also an ethics statement in the guidelines for authors that does not contain a safety keyword. Separate ethics statement that lacks a safety keyword. Ethics statement in the guidelines for authors that lacks a safety keyword. Ethics statement not found.

Of the publishers that had safety keywords in their ethics guidelines

- ACS, RSC, Elsevier, Wiley, DeGruyter, and Taylor & Francis
- A majority of the ethics guidelines used wording like “unusual” hazards should be clearly described.
- None defined “unusual.”

Faculty Perceptions of Ethics Guidelines

Frequency of Reading Ethics Guidelines (n=28)

Frequency of Use	Percentage
Always	11%
Sometimes	19%
Occasionally	19%
Rarely	26%
Never	26%

Perceptions of Contents of Ethical Guidelines (n=28)

Topic	Number of Mentions
Integrity	13
Data (trimming, omission, archiving)	10
Authorship	10
Simultaneous submission	4
Conflicts of interest	4
Permissions	4
Prior publication	3
Citations	3
Safety	0

Summary: Safety in Guidelines

- 98% of journals provide a link to Ethic Guidelines that include a safety keyword.
- 8% of Author Guidelines include a safety keyword.

Location of Safety Information

- Location in which safety should be mentioned specified by Guidelines for Authors

Safety Location	Number of Journals
Abstract	1
Both Experimental & Discussion	1
Unspecified Location	24
Experimental/Methods	33

Determining Safety Effectiveness

- 100 journals from 6 publishers
- Examined each article for a safety keyword

Number of Journal Articles Containing a Safety Keyword

Keyword	ACS	RSC	Springer	Elsevier	Wiley	Taylor & Francis
Safety	2	0	0	0	3	3
Caution	8	3	1	3	4	9
Danger	0	0	0	0	0	1
Hazard	1	1	0	3	4	1

Target Compounds

- Examined journals for 9 target compounds found on Particularly Hazardous Substances Lists

The Number of Articles that Mentioned the Target Compounds

	ACS	RSC	Springer	Elsevier	Wiley	Taylor & Francis
Butyl lithium	1	0	0	0	0	0
Lithium aluminum hydride	2	4	1	8	1	3
Silane	0	1	0	2	0	0
Germane	0	0	0	1	0	0
Hydrogen peroxide	4	0	3	2	2	4
Hydrofluoric acid	1	2	3	1	0	0
Trifluoroacetic acid	11	14	1	10	15	2
Phosphine	0	0	1	5	0	0
Diazomethane	0	1	0	0	1	0
Total	19	22	9	29	19	9
Safety warning related to target compound	0	0	0	0	0	1

Safety Keyword Use

	ACS	RSC	Springer	Elsevier	Wiley	Taylor & Francis
No precautions necessary	0	0	0	0	2	0
Use PPE/fume hood	2	1	0	0	2	2
Exothermic/corrosive vapors from reaction	2	1	0	1	0	0
Caution adding chemical or heating	2	0	0	0	0	4
Caution scaling up reaction	0	0	0	0	0	1
Specific chemical is hazardous	0	0	0	1	0	6
Take “caution” when using these results/methods	2	1	1	1	2	0
Chose this method because it is “safer”	3	1	0	3	7	1

Target Compounds

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Lithium aluminum hydride	2	4	1	8	1	3
Silane	0	1	0	2	0	0
Germane	0	0	0	1	0	0
Hydrogen peroxide	4	0	3	2	2	4
Hydrofluoric acid	1	2	3	1	0	0
Trifluoroacetic acid	11	14	1	10	15	2
Phosphine	0	0	1	5	0	0
Diazomethane	0	1	0	0	1	0
Total	19	22	9	29	19	9
Safety warning related to target compound	0	0	0	0	0	1

- 107 mentions of PHS compounds and 1 warning

American Chemical Society

- *Journal of Organic Chemistry* Guidelines for Authors: “special attention should be called to hazardous compounds or operation, and appropriate precautions should be described¹”
- Ethics Guidelines: “any unusual hazards inherent in the chemicals, equipment, or procedures used in an investigation should be clearly identified in a manuscript reporting the work²”

ACS Journal of Organic Chemistry

- A safety keyword appeared in 11 of 100 articles.
- Target compounds organo-Li, LiAlH_4 , H_2O_2 , HF, TCA mentioned 19 times.
- 0 warnings.

RSC Organic and Biomolecular Chemistry

- “Identify clearly ...unusual hazards....”
- 22 mentions of target compounds
- 2 warnings

Springer Catalysis Letters

- No safety keyword in Author Guideline or Ethics Guideline for any of the 132 Springer journals examined.
- No target compounds found.
- The word caution appeared in 1 of the 100 articles reviewed.
- The context was to “use caution” when using the results of methods described in the article.

Elsevier Tetrahedron

- “Authors are requested to draw attention to hazardous materials or procedures by adding the word CAUTION followed by a brief descriptive phrase and literature references if appropriate.
- Target compounds appeared 29 times with 0 cautions.
- Two cautions:
 - an exothermic reaction was hazardous
 - a specific reagent was hazardous

Wiley European Journal of Organic Chemistry

- Ethic guidelines: “to identify clearly in the manuscript any unusual hazards inherent in the use of chemical procedures or equipment in the investigation.”
- 19 target compounds; 0 cautions.
- Two other compounds received cautions.
- Two articles stated that none of the compounds or procedures were hazardous.

Taylor & Francis Organic Preparations and Procedures International: The New Journal for Organic Synthesis

- Ethics Guideline: “authors must include all appropriate warnings concerning any specific and particular hazards....”
- Six articles had the word CAUTION followed by a description.
- 8 target compounds mentioned; 1 caution.
- H_2O_2 was noted as easy to handle but required special precautions.

Our Conclusions

- There are holes in the safety net.
- Only 8% of author guidelines contain safety information.
- The majority of journals (59%) link to ethics guidelines that contain a safety keyword.
- Journals that ask authors to call attention to hazards don't generally provide clear instructions.
- Most call for identifying “unusual” hazards without defining “unusual.”

Our Recommendations

- Journal Guidelines to Authors should contain safety information in a separate section.
- Authors should designate hazards that might not be recognized by a first-year grad student who is replicating the experiment.
- “Potential” hazards as opposed to “unusual” hazards should be noted.
- All compounds that require a Standard Operating Procedure should be noted, perhaps with a special symbol or the word Caution.
- A separate sections called Hazards could be required.
- Hazard information can be archived electronically and not appear in print.
- Reviewers should be asked if all hazardous substances and procedures have been noted.

ACS Committee on Chemical Safety

- The Committee on Chemical Safety will ask all chemistry journal editors to include safety information in the author guidelines, develop a system to allow authors to indicate potentially dangerous materials and procedures, and ask expert reviewers to determine if the authors adequately describe hazards.
- Motion passed 8/22/2016

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