



With AI

Writing in Chemistry

How AI Works

The reaction produced a _____

gas

precipitate

compound

train





What Can AI Do?

- ✓ Review a large amount of content quickly;
- ✓ Summarize content efficiently;
- ✓ Translate content from and into multiple languages;
- ✓ Makes mistakes;
- ✓ Has difficulty with nuance.

What I Tell My Students About Using AI?

AI policy

Generative AI may be used for some writing-related tasks. These include the following:

- ✓ **searching for essay and paper topics** (AI may make up people who don't exist, so do your due diligence and validate the results);
- ✓ **searching for additional references on identified topics** (AI may hallucinate, so check to validate the existence of the resources);
- ✓ **summarize or extract relevant information from references** (sometimes the AI makes stuff up, so confirm the accuracy of its output);
- ✓ **draft and outline for your essay or paper** (you will need to make your prompt very explicit to get useful information);
- ✓ **help with referencing styles** (you may need to give it some additional instruction to get correct references)
- ✓ **provide recommendations on improving your writing** (know exactly what you want out of the process before you ask the AI to engage in this, otherwise it's risky).

What I Tell My Students About Using AI?

- The use of generative AI is for the following tasks is considered **plagiarism** and is detected by Turnitin:
 - write the whole or significant part of the essay or paper assignment;
 - write paragraphs that you submit without modification as your own work;
 - write the peer-review you have been assigned.

Maintaining Rigor in an AI Future

Best practices to decrease motivation for cheating:

Sufficient time with multiple checkpoints (prospectus, instructor meeting, draft, peer review, instructor review, final submission);

Multiple modalities of demonstrating skill (discussions, writing tasks, review, editing tasks);

Provide clear and explicit expectations (it's easier to start when you know what you're doing);

Allow for choice in topic selection, if possible (you may give examples or suggestions);

Provide adequate support (accessing the support should be part of the requirements)

Provide samples of AI work to demonstrate its limitations (you may engage in a feedback loop with an AI to train it for a task).

Assignment Sample

Topic: Select an element or simple inorganic compound of your choice and address in detail at least one form that it is found in nature, one method of extraction and purification and present at least one industrial application.

Due dates:

- **August 30:** Meet with your instructor to get your selected topic approved. Bring a brief prospectus (12 font, double spaced, one page) and at least 3 relevant literature references in ACS format with you to the meeting and be prepared to discuss your choice.
- **September 9:** The paper should be completed and shared for peer review.
- **September 16:** The peer review for paper 1 must be completed.
- **September 17-20:** Schedule a meeting and meet with the instructor to discuss peer feedback and corrections.
- **September 26:** Respond to feedback and make corrections to the paper. The paper needs to be turned in by midnight via Canvas with the Turnitin check.

Penalty for late work: 10 points/day for each task due date

Assignment Sample

Recommended for the prospectus:

- ✓ Select an element or simple inorganic compound;
- ✓ Identify at least one method for extraction and purification;
- ✓ Identify at least one industrial scale application;
- ✓ Cite at least 3 original sources using ACS style formatting.

Assignment Sample

Recommended structure for the paper:

- ✓ **Abstract:** 3-5 sentences highlighting the most significant aspect of your paper;
- ✓ **Introduction:** 1-1.5 pages that create the context for the selected topic;
- ✓ **Extraction and Purification:** 3-3.5 pages describing the extraction and purification of the selected element starting with the form it is most commonly found in nature and ending with the element with sufficient purity for the selected application;
- ✓ **Application:** 2-2.5 pages describing one major application of your selected element. It has to be an application of the element, not of a compound containing the element;
- ✓ **Conclusion:** 0.5 page evaluating the merits of your selected element. This can include recycling methods, environmental impact, potential replacements, additional applications, economic impact or any other aspect not previously explained in the paper.
- ✓ **References:** at least 7 original sources using ACS referencing style.

Assignment Sample

After scoring the paper using the above rubric, points will be deducted for late submission (**20 points/day late**) or missing pages (**15 points/missing page**).

When the originality report indicates a **similarity index** above 25% OR the presence of **AI generated content** exceeds 25%, the paper will receive a score of **0**.

Criteria	Unsatisfactory	Partially proficient	Proficient	Exemplary
Format	The paper does not follow the recommended format. It may be missing or have a misplaced title page, missing abstract, unclear section headings, disorganized text, improperly formatted chemical formulae, and/or poorly structured sentences. 0 points	The general format is followed, but there are two or more mistakes, such as a missing or misplaced title page, missing abstract, unclear section headings, disorganized text, improperly formatted chemical formulae, or poorly structured sentences. 3 points	The general format is followed with only one minor mistake, such as a missing or misplaced title page, missing abstract, unclear section headings, disorganized text, improperly formatted chemical formulae, or poorly structured sentences. 8 points	The paper is well-structured with no formatting mistakes. It includes a title page, an abstract, clearly indicated sections, organized text, properly formatted chemical formulae, and well-structured sentences. 10 points
Abstract	The abstract is missing. 0 points	The abstract provides an overview of the paper but lacks detailed numerical data and does not fully highlight the best parts of the paper. 3 points	The abstract is well-worded and provides some insight into the content of the paper but could include more numerical data and highlight key aspects more effectively. 7 points	The abstract is clearly phrased and concisely expresses the main points of the paper, including relevant numerical data and highlighting the best parts of the paper. 10 points
Scientific content	The paper presents no data indicating comprehension of the topic, or there are frequent cases of misinterpreted information. 20 points	The paper shows occasional misinterpretation of data and limited scientific content, lacking depth and clarity. It may not fully cover the extraction and purification process or the conversion to a usable product. 50 points	The paper contains relevant scientific content with a good comprehension of the topic. It details the extraction and purification processes from ore to pure substance and discusses the conversion into a usable product, though some areas could benefit from more detailed explanations and additional data. 80 points	The paper is free of mistakes in data interpretation and includes a significant amount of scientific detail. It thoroughly covers the extraction and purification process from ore to pure substance and clearly explains the conversion into a usable product. The introduction provides sufficient context, and the conclusion evaluates implications and further applications. 100 points
Scientific language	The paper has poor grammar and frequent syntax errors. Ideas are not presented clearly or concisely, and sources are not adequately utilized. 0 points	The paper has poor grammar or frequent syntax errors. Ideas are partially clear but not coherently organized, making the text hard to understand. 10 points	The paper has occasional grammar or syntax mistakes. Ideas are mostly clear and concise, with the content well-organized in a logical sequence. 25 points	The paper has near perfect grammar and syntax, appropriately uses scientific terms, and presents ideas clearly and concisely in an organized, logical sequence. 40 points
Participation in peer review	Did not participate in peer review, did not submit the review by the due date, or did not approach it professionally. 0 points	Participated in the peer review but put forth minimal effort or missed the due date by less than two days. 5 points	Participated in the activity and submitted the review by the due date, but the work did not address all necessary components. 10 points	Participated in the activity and submitted a clear, complete, and professional review by the due date. The review was thorough and addressed all necessary components. 20 points
References	References are missing or not original sources. 0 points	References are original but did not follow ACS guidelines and were not linked to the text in numerical order. 5 points	References are in the correct format but not linked to the text in numerical order. 15 points	Relevant and meaningful references are used, properly formatted, and linked to the text in numerical order according to ACS guidelines. 20 points