

# Acknowledge, Describe, Evidence template

Please include a completed version of this template as an appendix to any submitted work that has involved the use of generative AI (GenAI) technology ([further information on GenAI and assessment](#)).

## Acknowledge

I acknowledge the use of <insert AI system(s) and link> for the following purposes:

- to generate materials for background research and self-study in the drafting of this asseent.
- to generate materials that were included within my final assessment in modified form.

## Describe

Please provide a short summary of how you used generative AI in your assignment. You may wish to include the following information:

- What prompts did you use?
- What outputs did you generate?
- How did you use/adapt/develop the outputs?

Summary:

What prompt I used? "insert paragraph here" make scientific Papers on "insert topic here"

What outputs did I generate? Paragraphs with less grammar errors and more concise phrasing.

List of typically 3-4 possible sources

How did I alter the outputs? I made changes based on if it maintained what I was trying to convey.

the output was used purely to locate papers and so not alteration was required.

Overall the AI was used as a means of grammar checking to improve and increase the clarity of what had been written. The AI was also used to aid in locating papers over the course of the thesis but not output was used for these.

## Evidence

Please provide evidence of the outputs that you generated by copying and pasting below or by providing a screenshot.

Generative AI system: Microsoft Copilot

Prompt:

"To determine if the surface change cause by the formic acid was morphological or the formation of a secondary phase XRD was performed. This XRD is shown in Figure 16 where there is a very clear change in the LLZO was observed. One sample was submerged in the formic acid for 4 days to exacerbate any secondary phase that would be present. This XRD shows that the base LLZO has mostly been consumed in the reaction with the formic acid, but it was discovered that the (211) peaks remained exposed after the submersion in formic acid. this would be implausible as the complete loss of the other peaks would indicate that either the LLZO is being consumed while submerged and therefor the structure would be collapsing as a result, this shouldn't be the LLZO. This indicates that the outer layer of LLZO becomes Lithium Formate monohydrate which like the  $\text{Li}_2\text{CO}_3$  may act as an obstructive layer." make scientific

Output:

To ascertain whether the surface changes induced by formic acid were morphological or due to the formation of a secondary phase, X-ray diffraction (XRD) analysis was conducted. Figure 16 presents the XRD results, revealing significant alterations in the  $\text{Li}_7\text{La}_3\text{Zr}_2\text{O}_{12}$  (LLZO) structure. One sample was immersed in formic acid for a duration of 4 days to accentuate any potential secondary phase formation. The XRD data indicate that the primary LLZO phase was largely consumed during the reaction with formic acid, yet the (211) peaks remained observable post-immersion. This observation suggests that the complete disappearance of other peaks implies a total consumption of LLZO, potentially leading to structural collapse, which should not be the case for LLZO. Therefore, it is inferred that the outer layer of LLZO transforms into lithium formate monohydrate, similar to  $\text{Li}_2\text{CO}_3$ , which may function as a barrier layer.

## Declaration

- I confirm that no content created by generative AI technologies has been presented as my own work.