|  |  |
| --- | --- |
| Book Name: | [Chemistry and Biochemistry: Research Progress](https://www.bookpi.org/bookstore/product/chemistry-and-biochemistry-research-progress-vol-1/) |
| Manuscript Number: | **Ms\_BPR\_5689** |
| Title of the Manuscript: | **A pH Measurement of Acetic Acid-Sodium Acetate Buffer Solutions Using a pH Meter at Ambient Temperature** |
| Type of the Article | **BOOK CHAPTER** |

**Special note:**

# A research paper already published in a journal can be published as a Book Chapter in an expanded form with proper copyright approval.

**Source Article:**

**This chapter is an extended version of the article published by the same author(s) in the following journal. Journal of Applied Chemical Science International, Volume 15, Issue 2, Page 30-35, 2024.**

**DOI: 10.56557/jacsi/2024/v15i28894**

|  |
| --- |
| **PART 1: Comments** |
|  | **Reviewer’s comment****Artificial Intelligence (AI) generated or assisted review comments are strictly prohibited during peer review.** | **Author’s Feedback** *(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **Please write a few sentences regarding the importance of this manuscript for the scientific community. A minimum of 3-4 sentences may be required for this part.** | **The document discusses the preparation of acetic acid-sodium acetate buffer solutions and the determination of their pH using a pH meter at approximately 25°C. The preparation involved mixing specific volumes of glacial acetic acid and sodium acetate, resulting in a buffer solution with a pH that was adjusted to 4.7 by adding 5N NaOH solution.** |  |
| **Is the title of the article suitable?****(If not please suggest an alternative title)** | **It needs to be changed and made more concise.****Measurement of pH of Acetic Acid-Sodium Acetate Buffer Solutions** |  |
| **Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.** | **The abstract of the article provides a clear overview of the preparation and measurement of acetic acid-sodium acetate buffer solutions, but it could be enhanced by including a few additional details. Here are my suggestions:**1. **Clarification of the Purpose: The abstract could benefit from a brief statement about the significance of measuring pH in buffer solutions, particularly in biochemical and industrial applications. This would provide context for the research findings, as mentioned in the conclusion that these buffers are essential for various biological and chemical applications.**
2. **Methodological Details: While the abstract mentions the use of a calibrated digital pH meter, it could specify the importance of calibration and the accuracy it provides in pH measurement. This detail is highlighted in the experimental section, where the calibration process is described.**
3. **Results Summary: The abstract states that the pH was adjusted to 4.7, but it could also briefly mention the initial pH reading and how it changed with the addition of NaOH. This would give readers a clearer picture of the results and the buffer's behavior, as discussed in the results and discussion section.**

**Incorporating these points would make the abstract more comprehensive and informative for readers.** |  |
| **Is the manuscript scientifically, correct? Please write here.** | **Yes** |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.****-** | To improve your article, you may consider the following references:**Harned and Ehlers** have conducted research on the dissociation constant of acetic acid at different temperatures, which can help in understanding buffer behavior under different conditions.**Donahue and Panek** have studied the buffer capacity of various acetic acid-sodium acetate systems, which can provide useful information on the efficiency of your buffer.**Green** has discussed the preparation of acetate and phosphate buffer solutions with specific pH and ionic strength in an article that can help in comparing and improving your methods.DOI: 10.48309/chemm.2023.414616.1731 DOI: 10.1007/s42250-024-00921-6DOI: https://themedicon.com/pdf/mcps/MCPS-22-034.pdfThese references can enrich the scientific content and accuracy of your article. |  |

|  |  |  |
| --- | --- | --- |
| **Is the language/English quality of the article suitable for scholarly communications?** | Since this manuscript is to be published online, the highlighted parts will need to be retyped to resolve the similarity problem. Link:<http://dl.daneshlink.ir/Ms_BPR_5689.pdf> |  |
| **Optional/General** comments | This research seems to have scientific value and may be suitable for publication. In this article, precise methods for preparing and measuring the pH of sodium acetate and acetic acid buffer solutions are presented, which are crucial in many biochemical and vital chemical applications. Additionally, using a calibrated digital pH meter for accurate pH measurement enhances the scientific credibility of the research.Furthermore, the article explores the factors affecting the pH of buffer solutions and their behavior towards pH changes, which can contribute to a better understanding of buffer systems. This information is highly important for maintaining stable conditions in biochemical experiments and industrial processes.This research seems to have scientific value and may be suitable for publication. In this article, precise methods for preparing and measuring the pH of sodium acetate and acetic acid buffer solutions are presented, which are crucial in many biochemical and vital chemical applications. Additionally, using a calibrated digital pH meter for accurate pH measurement enhances the scientific credibility of the research.Furthermore, the article explores the factors affecting the pH of buffer solutions and their behavior towards pH changes, which can contribute to a better understanding of buffer systems. This information is highly important for maintaining stable conditions in biochemical experiments and industrial processes.Considering the scientific content and precise methodology presented, this research can be given a score between 7 to 8 out of 10. This score is due to the quality of the data and methods used in the research. **Advantages:**1. pH Stability: Acetic acid-sodium acetate buffers are effective in maintaining a stable pH, which is crucial for various biochemical and chemical processes. The study demonstrates that the buffer can resist pH changes upon the addition of strong acids or bases, maintaining a pH around 4.7 after the addition of 5N NaOH.
2. Ease of Preparation: The preparation of this buffer solution is straightforward, involving the simple mixing of glacial acetic acid and sodium acetate in specific proportions. The document outlines a clear method for creating a 0.2M acetic acid solution and the corresponding sodium acetate solution.
3. Common Ion Effect: The buffer utilizes the common ion effect, which helps suppress the dissociation of the weak acid (acetic acid) when a strong electrolyte (sodium acetate) is added. This characteristic allows the buffer to effectively resist changes in pH.

**Disadvantages:*** 1. Limited Buffering Capacity: While acetic acid-sodium acetate buffers are effective within a certain pH range, they can become less effective if the concentrations of the acid or base exceed their buffering capacity. The document notes that excessive addition of acid or base can lead to fluctuations in pH, indicating a limit to the buffer's effectiveness.
	2. Temperature Sensitivity: The pH of buffer solutions can be influenced by temperature changes, which may affect their performance in different environmental conditions. The introduction mentions that various factors, including temperature, can influence the pH of buffer solutions.
	3. Specific pH Range: This buffer is primarily effective for acidic conditions (pH < 7). It may not be suitable for applications requiring neutral or basic pH levels, limiting its versatility in certain experimental setups.
 |  |

|  |
| --- |
| **PART 2:** |
|  | **Reviewer’s comment** | **Author’s comment** *(if agreed with the reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **Are there ethical issues in this manuscript?** |  |  |

 **Reviewer details:**

 **Ferydoon Khamooshi, University of Zabol, Iran**