Review Form 2

Book Name:	**Scientific Research, New Technologies and Applications**
Manuscript Number:	**Ms_BPR_3475**
Title of the Manuscript:	**Buffer Standards for the Biochemical pH of the Zwitterionic Buffer N-Tris-(Hydroxymethyl) Methyl-2-Aminoethanesulfonic Acid (TES) from 5℃ to 55℃**
Type of the Article	**Book Chapter**

PART 1: Review Comments

Compulsory REVISION comments	**Reviewer's comment**	**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. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.	This manuscript is important for the scientific community because it provides precise pH measurements of TES buffer solutions at physiological ionic strength, similar to that of blood. By evaluating these buffers across a range of temperatures (5°C to 55°C) and correcting for liquid junction potentials, the study offers reliable pH standards for experiments that need to closely mimic physiological conditions. These well-characterized TES buffers are valuable for researchers who require accurate pH control, making this work a useful reference for biochemical and biomedical studies.	
Is the title of the article suitable? **(If not please suggest an alternative title)**	The title appears suitable if it clearly reflects the study's focus on TES buffer solutions, their pH determinations, and the conditions (such as ionic strength and temperature range) that make these buffers suitable as secondary standards for physiological applications. However, it might be beneficial for the title to mention key points like ionic strength and temperature range if they aren't already included, as these are central aspects of the study and highlight its relevance for physiological applications. Alternate suggestion"pH Measurements of TES Buffer at Physiological Ionic Strength from 5°C to 55°C for Secondary Standard Use"	
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 provides a good overview of the study, covering the determination of pH for TES buffer solutions under physiological ionic strength and a wide temperature range. However, a few additions and slight restructuring might enhance clarity and completeness: **Suggestion for new abstract must include objective, key finding,and significance as example.** This study aims to establish TES buffer solutions as reliable secondary pH standards for physiological applications. The authors determined the pH values for one TES buffer solution without NaCl and nine TES buffer solutions with NaCl, achieving an ionic strength of I = 0.16 mol·kg^{-1}, similar to that of blood. These buffer solutions were evaluated over a temperature range of 5°C to 55°C using an extended version of the Debye-Hückel equation. pH values were reported according to 1) the Debye-Hückel extension of the Bates-Guggenheim convention over 5°C to 55°C, and 2) with and without liquid junction correction at 25°C and 37°C. These TES buffers demonstrated stability in the pH range of 7.2 to 7.5, making them suitable as secondary reference standards for pH measurements under physiological ionic strength	
Are subsections and structure of the manuscript appropriate?	The methods section needs to be separated, along with the results and discussion. The conclusion part need to be included.	
Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.	This manuscript is scientifically sound because it carefully examines the behavior of TES buffer solutions across a wide temperature range. The methods used for measuring pH and temperature are reliable and standard in solution chemistry. The study correctly considers how temperature affects buffer capacity and pH stability, which is important for accurate results. Overall, the approach is well thought out and provides useful insights for both laboratory and practical applications.	

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Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form. **-**	**This book chapter has 18 references; the latest paper referred to is from 2009. This is outdated and the reference needs to be updated!**	
Minor REVISION comments **Is the language/English quality of the article suitable for scholarly communications?**	yes	
Optional/General comments	Update references	

PART 2:

	Reviewer's comment	**Author's comment** *(if agreed with 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?	*(If yes, Kindly please write down the ethical issues here in details)*	

Reviewer Details:

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Department, University & Country	**The National Center for Earth and Environmental Nanotechnology Infrastructure, US**