

[Review Form 2](#)

Book Name:	Recent Developments in Chemistry and Biochemistry Research
Manuscript Number:	Ms_BPR_3470
Title of the Manuscript:	Thermodynamics of the Second Dissociation Constants (pK ₂) of Piperazine-N,N'-bis-2-hydroxypropanesulfonic Acid (POPSO Sesquisodium Salt) and Associated Thermodynamic Functions from (278.15 to 328.15) K
Type of the Article	Book Chapter

PART 1: Review Comments

Compulsory REVISION comments	Reviewer's comment	Author's Feedback <i>(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
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.		
Is the title of the article suitable? (If not please suggest an alternative title)		
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.		
Are subsections and structure of the manuscript appropriate?		
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.		
Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.		
-		
Minor REVISION comments		
Is the language/English quality of the article suitable for scholarly communications?		
Optional/General comments	The article submitted by the authors entitled "Thermodynamics of the Second Dissociation Constants (pK ₂) of Piperazine-N,N'-bis-2-hydroxypropanesulfonic Acid (POPSO Sesquisodium Salt) and Associated Thermodynamic Functions from (278.15 to 328.15) K" provides valuable insight into the thermodynamic properties of this important buffer compound. The authors have conducted a thorough investigation of pK ₂ values and related thermodynamic functions, providing a comprehensive understanding of POPSO's potential usefulness as a pH buffer standard in physiological environments. It is recommended that the authors address the following questions and suggestions before this chapter is accepted for publication: Abstract	

Review Form 2

	<p>1. The equation given in the abstract provides a good fit for the measured pK₂ values across a wide temperature range. However, is there a physical or chemical interpretation that can be provided for this relationship between pK₂ and temperature?</p> <p>2. It is stated that the buffer solutions of POPSO and its sodium salt can be useful for pH control in the physiological pH range of 7.0-8.5. Can the authors provide more information about the specific applications where such buffering systems could be useful?</p> <p>Introduction</p> <p>3. While the authors provide a detailed literature review on previous research on pK₂ values and related thermodynamic functions of POPSO, it would be beneficial to include a brief explanation of the significance of these parameters in understanding the pH buffering capacity of POPSO.</p> <p>4. While the authors provide details on the experimental setup, it would be helpful to include information on the accuracy and precision of the measurements and any potential sources of error.</p> <p>Experimental</p> <p>5. Since all buffer solutions were prepared a day before the e.m.f measurements, was there any consideration given to the stability of the solutions over time, and if so, how was this accounted for in the experiments?</p> <p>6. The authors mention that "vacuum corrections were made to all masses". Can you elaborate on this process and explain its purpose in the context of the experiments?</p> <p>Method and results:</p> <p>7. The authors mention that the standard deviation between initial and middle e.m.f readings was ± 0.04 mV at 298.15 K. Can you elaborate on the significance of this standard deviation and how it may impact the accuracy of the results?</p> <p>8. The authors state that "the e.m.f values have been corrected, as usual, to the partial pressure of one atmosphere of dry hydrogen." Can you explain the reason for this correction and how it may affect the interpretation of the results?</p> <p>9. The authors utilize the Ives-Moseley equation to fit the values of pK₂ at different temperatures. Can you explain what this equation is used for and how it can help determine the thermodynamic quantities for the dissociation process?</p> <p>Discussion</p> <p>10. The authors compare the values of thermodynamic quantities of POPSO with structurally similar compounds, emphasizing its usefulness as a pH buffer standard for physiological use. In light of this, could the authors elaborate on how the thermodynamic properties of POPSO may impact its effectiveness as a pH buffer, especially in terms of stability and buffering capacity?</p> <p>11. In the discussion section, the authors point out that the discrepancy in pK₂ values between their measurements and previous studies (Azab et al.) can be attributed to differences in measurement techniques.</p>	
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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?	<i>(If yes, Kindly please write down the ethical issues here in details)</i>	

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