**Author's Response to Decision Letter for 2904**

Experimental measurements and modeling of solvent activity and surface tension of binary mixtures of polyvinylpyrrolidone in water and ethanol

The authors of the present paper would like to express their acknowledgments to the reviewers and the editor for their scientific evaluation.

We are very thankful to the reviewers for their deep and thorough review. We have revised our present research paper in the light of their useful suggestions and comments. We hope our revision has improved the paper to a level of their satisfaction. In response to reviewers’ comments, all of recommended corrections are introduced in the revised manuscript (red words).

Below, please find our itemized answers/rebuttals to the reviewers’ comments:

**Response to Reviewer #C Comments**

Special thanks are extended to Reviewer #C for close attention and providing clear-cut positive recommendations.

1. Line 9: Change 40,000 to 30,000 or K30 to K40:

… molecular weights of 25,000 (K25) and 40,000 30, 000 (K30) in ….

Response: K30 was changed to K40 throughout the revised manuscript.

2. Lines 31:

… have been discussed in literature.1–9 ….

Response: The sentence was corrected in the revised manuscript.

3. Line 38:

… but the lack of resources and facilities makes the experimental measurements of the liquid surface tension difficult and infeasible impractical.

Response: The sentence was corrected in the revised manuscript.

4. Lines 41-42:

Give reference(s) for the methods mentioned.

Response: Appropriate references were given for the methods mentioned in the revised manuscript.

5. Lines 48-49:

Move the reference #16 from the end of the line to after the authors’ names: Egemen et al.16…

Response: Reference #16 was moved from the end of the line to after the authors’ names: Egemen et al.16…

6. Line 63: Change 40,000 to 30,000 or K30 to K40:

… molecular weights of 25,000 (K25) and 40,000 30, 000 (K30) in ….

Response: K30 was changed to K40 throughout the revised manuscript.

7. Lines 68-69: Show reference number(s):

…based on Eyring’s model#? and Flory-Huggins theory#?, …

Response: Appropriate references were given for the Eyring’s model and Flory-Huggins theory in the revised manuscript.

8. Line 75: Is it 40000 or 30000?

Response: 40000 is correct.

9. Line 100:

…values were are reported. The following equation was is presented to determine the density of solution…

Response: The sentence was corrected in the revised manuscript.

10. Line 118:

standard deviation values were are reported. The following equation was is presented to …

Response: The sentence was corrected in the revised manuscript.

11. Line 141: Remove ‘the’ at the end of the line:

Usually if a droplet of solvent is dripped on the one of the thermistors…

Response: ‘the’ was removed at this end of the line in the revised manuscript.

12. Line 146: Either give reference for Eqn. (3) which is used to calculate the activity or give reference.

Response: Appropriate reference was given for Eqn. (3) which is used to calculate the activity in the revised manuscript.

13. Line 170: At the end of the line, change ‘.’ to ‘:’ and add reference for the equation:

… following equation Ref:

Response: ‘.’ was changed to ‘:’ and a reference was added for Eqn. (4).

14. Lines 173-174: Continue line 174 at the end of line 173: … respectively. xi is the molar fraction of component i in the mixture, T…

Response: The sentence was corrected in the revised manuscript.

15. Line 196 is redundant. Same is mentioned in line 192. Remove it.

where … is the activity coefficient of the solvent.

Response: The sentence was deleted in the revised manuscript.

16. Line 200: Check Eqn. 11 – at the end of Eqn. is it:    (1-x1)∂gE/RT∂x1 or (1-x1)∂gE/RT∂c1 ?

Response: The Eqn. 11 was corrected to  in the revised manuscript.

17. Line 207: A thermodynamic model based on Butler butler equation23…

Response: butler equation was corrected to Butler equation32 in the revised manuscript.

18. Line 208: …polymer solutions is was presented.23

Response: The sentence was corrected in the revised manuscript.

19. Lines 242 and 243: Remove the word ‘respectively’ from these two lines.

Response: The word ‘respectively’ was deleted in the revised manuscript.

20. Lines 246-247: Give reference for the statement: “Theoretically, the volume of the polymer molecule is equal to the volume of a solvent molecule.Ref”

Response: Appropriate reference was given for the above statement in the revised manuscript.

21. Line 253: Do you mean: A1 = A2 =A ?

Response: The equation of the assumption was corrected to  in the revised manuscript.

22. Line 327: check on … 40,000 in water…

Response: 40000 is correct.

23. Line 335: Change: It shows that the proposed… to: These results show that the proposed …

Response: “It shows that the proposed…” was changed to “These results show that the proposed …” in the revised manuscript.

**Response to Reviewer #E Comments**

Special thanks are extended to Reviewer #E for close attention and providing clear-cut positive recommendations.

1. Line 80, page 3: authors need to check the accuracy of Sartorius balance;

Response: The accuracy of Sartorius balance was corrected to ±0.1 mg in the revised manuscript.

2. line 206, page 10: subtitle need to be in italic font;

Response: The subtitle font has been changed to italic.

3. line 279, page 13: in title of Table III obvious is missing “Activity of water for various solutions of K25 and K30 in water and ethanol at different temperatures and mass fractions”; also the Table III is not well designed;

Response: The title of Table III was changed to “Activity of water for various solutions of K25 and K30 in water and ethanol at different temperatures and mass fractions”; also Table III was presented with a better design in the revised manuscript.

4. line 303, page 15: AARE error in Table IV should be shown for every solution separately and not for two solutions combined. In the same table data for K30-ethanol solution (w=0.3) are missing because AARE are calculated for combined K25-ethanol and K30-ethanol solutions;

Response: AARE error in Tables III and IV were shown for every solution separately in the revised manuscript.

5. line 334,page17: Instead AARE there should be Overall average absolute relative errors and that values should be inserted in Table III and Table IV.

Response: “Average absolute relative errors” have been replaced by “Overall average absolute relative errors” and that values were inserted in Table III and Table IV of the revised manuscript.

6. Authors need to add nomenclature

Response: Nomenclature was added in the end of revised manuscript.

All recommended corrections are introduced into the revised manuscript with red words.

Sincerely

Corresponding author