

From:- Prof. H.C. Swart
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Date:- 14 July 2017

To,

Editor

SAIP2016,

Subject: - Reply to reviewer's comment and modified manuscript titled "Spectroscopic investigation of Tm^{3+} containing Lithium borate glasses"

Dear Sir,

Thank you for your comments and suggestions on our manuscript. These comments and suggestions on our paper helped us to improve our manuscript scientifically. It was a rewarding process to work on the queries raised by the reviewer. Please find herewith the manuscript which has been modified in accordance with the reviewer's comments on our paper entitled "*Spectroscopic investigation of Tm^{3+} containing Lithium borate glasses*" which was submitted to be published in **SAIP2016 proceedings**.

The point wise reply to reviewer's comment is summarized below:

Reviewer #1:

Comment 1 Units in Fig. 2 for the cross sections seem to be cm^{-2} , not cm^2 .

Reply We corrected the typo error and also updated in the Figure 2 as cm^2

Comment 2 What do the symbols AT and A mean in the expression for the branching ratio, see Eq. (3)?

Reply Reviewers suggestion incorporated in the revised manuscript.

Comment 3 In Table 3 there are large differences between the experimental branching ratios and the theoretical ones. Please explain.

Reply The calculated branching ratio is the theoretical outcome obtained by taking into account the unitary matrix elements and the JO parameter. The experimental one is obtained by taking into account the emission cross section of the glasses. The observed difference in the experimental and calculated ratios may be due to the radiative and non radiative processes that happen during the excitation and emission processes. As the theoretical value predict the branching ratio but does not consider all the processes in the excitation and

emission. On the other hand the experimental value is the result obtained by considering all the channels. A sentence was added to text.

Reviewer #2:

Comment 1 Abstract is too short - does not adequately reflect information in the paper.

Reply Reviewers suggestion incorporated in the revised manuscript.

Comment 2 Figure 2: thickness of lines needs to increase and font size needs to be increased to improve legibility

Reply Reviewers suggestion incorporated in the revised manuscript.

Comment 3 page 4, first line on page, what is J' ? Only J in eq. 1

Reply Reviewers suggestion incorporated in the revised manuscript in equation 1.

Comment 4 page 3, eq 1, what is n?

Reply Reviewers suggestion incorporated in the revised manuscript.

Comment 5 page 4, lines below equation 2: it is stated that the measured and calculated values are very close to each other and this statement is used to justify the quality and accuracy of the fitting procedure used. Looking at Table 2, there are large differences in measured and calculated values for 1G4 (first manifold in table). For the other values, it needs to be stated what tolerances are acceptable before it can be said the values are "very close to each other". The text and the table thus partially contradict each other and this needs to be rectified.

Reply The values for the manifold 1G4 has a very large difference between the calculated and experimental values. This difference may be due to the hypersensitivity of the 1G4 transition. As the hypersensitive transition is strongly dependent on the host and surrounding and their predicted and experimental values may vary. Sentences added to text.

Comment 6 page 4, paragraph above figure 3, formatting of omega inconsistent. Bold or not bold?

Reply Reviewers suggestion incorporated in the revised manuscript.

Comment 7 page 4, figure 3, font sizes too small and resolution too low

Reply Reviewers suggestion incorporated in the revised manuscript.

Comment 8 page 4, text below figures 3 and 4: references are made to figure 3(b) and 4(a). Which are these?

Reply Reviewers suggestion incorporated in the revised manuscript. Figure numbers corrected.

Comment 9 page 5, figures 5 and 6, font size too small and resolution too low

Reply Reviewers suggestion incorporated in the revised manuscript.

Comment 10 Page 5, table 3, what does Tm1, Tm2, etc. refer to? This is the only place where this reference for the samples is used.

Reply Reviewers suggestion incorporated in the revised manuscript. Defined in Experimental part.

Comment 11 in references, please check: [3] Journal of Rare Earths [4] Journal of Rare Earths

[11] Journal of Non-Crystalline Solids? [12] is this the correct journal title abbreviation? [13] is this the correct journal title abbreviation?

Reply Reviewer's suggestion incorporated in the revised manuscript. References corrected.

Reviewer #3:

Comment 1 Abstract, line 3: the Judd-Ofelt theory were used / was use

Reply Reviewer's suggestion incorporated in the revised manuscript.

Comment 2 Page 1, Introduction, line 9: "... amplifier for uses" / for applications

Reply Reviewer's suggestion incorporated in the revised manuscript.

Comment 3 Page 1, line 16, etc.: "... the J-O parameters". Introduce the acronym in full, before using it. Moreover, later in the article (page 4, etc.) "JO" is used. Standardise

Reply Reviewer's suggestion incorporated in the revised manuscript.

Comment 4 Page 1, line 20: "... branching ratios have been reported .." / delete "have been" and replace with "are".

Reply Reviewer's suggestion incorporated in the revised manuscript.

- Comment 5** Page 2, Experimental, line 4: "... of the melt the melt" / Insert comma between "melt" and "the melt".
- Reply** Reviewer's suggestion incorporated in the revised manuscript.
- Comment 6** Page 2, line 13: "NIR-PMT". State acronym in full text before using it.
- Reply** Reviewer's suggestion incorporated in the revised manuscript.
- Comment 7** Page 3, Results and Discussion, line 5: "In this spectra " / these spectra.
- Reply** Reviewer's suggestion incorporated in the revised manuscript.
- Comment 8** Page 3, line 8: $\square \square(\square)d\square$ to be " $(\square \square(\square)d\square)$ ". Note also that throughout the article a space should be introduced between $\square(\square)$ and $d\square$ as in the current text, these two are too close together.
- Reply** Reviewer's suggestion incorporated in the revised manuscript.
- Comment 9** Table 1. What is the significance of the 2nd, 3rd and 4th decimal places for " $\square \square(\square)d\square$ " ? Are these significant, or do they simply follow from the computer calculation ? The same question applies to values in Table 2.
- Reply** Reviewer's suggestion incorporated in the revised manuscript. The values in the Table 1 are taken from the obtained values from the program used which originally give values up to the 8th decimal point and we rounded it to the 4th decimal. After performing the calculation the values obtained in table 2 varied from the 6th to the 8th decimal. We use the values up to the 4th decimal to maintain the accuracy of calculations. But to maintain the consistency we rounded up to 2nd decimal in all tables.
- Comment 10** What are the meaning of the other symbols in equation (2) ? Only \square and U' are defined.
- Reply** Reviewer's suggestion incorporated in the revised manuscript.
- Comment 11** On page 4, line 7 it is stated: "line strengths have values very close". That certainly is not true for e.g. G4 and even H5 !! Rather state "have values relatively close".
- Reply** Reviewer's suggestion incorporated in the revised manuscript.
- Comment 12** Page 4, line12: "which confirm that there was" / confirms
- Reply** Reviewer's suggestion incorporated in the revised manuscript.
- Comment 13** Insert a space below Figure 3 and the subsequent paragraph

- Reply** Reviewer's suggestion incorporated in the revised manuscript.
- Comment 14** Page 4, line 17: "after comparing with the literature". Where is the Reference for this statement ?
- Reply** Reviewer's suggestion incorporated in the revised manuscript.
- Comment 15** Page 4, line 18: there is no Figure 3(b) in this article!
- Reply** Reviewer's suggestion incorporated in the revised manuscript. Figures renumbered.
- Comment 16** Page 4, line 21: there is no Figure 4(a) in this article!
- Reply** Reviewer's suggestion incorporated in the revised manuscript.
- Comment 17** Page 5. The part of the sentence starting with "where n is the refractive index" and also the 1st sentence on page 6 should be shifted up to before Fig. 5, as it forms part of the previous sentence/equations. Note too that all symbols in equation (3) have not been defined!
- Reply** Reviewer's suggestion incorporated in the revised manuscript.
- Comment 18** Caption of Table 3: rather include the units of each parameter, currently in the caption, into the table with the respective Parameter. As it is currently, it is rather confusing. (At least in this table there are only 2 decimal numbers for values included in the table).
- Reply** Reviewer's suggestion incorporated in the revised manuscript.
- Comment 19** Page 6, line 7: there is no Figure 4 (b) in this article!
- Reply** Reviewer's suggestion incorporated in the revised manuscript.
- Comment 20** Page 6, line 9: there is no Table 5 in this article!
- Reply** Reviewer's suggestion incorporated in the revised manuscript.

Considering the point wise reply to the reviewer comments and certain modifications incorporated in the manuscript the same may kindly be considered for publication in *SAIP2016, proceedings*.

Thanking you,

With Best Regards,

H. C. Swart