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Peer Review

Health Scope
Article DOI: https://doi.org/10.5812/jhealthscope.64862
Published in: Health Scope: 8(2) ; e64862

Peer Review Report for "Preparation of Sound Absorption Material Based on Interpenetrating Polymer Network (PU/PMMA IPN)"

Author(s): gholamreza moradi, Pravin Nassiri, Amir Ershad-Langroudi, Mohammad reza Monazzam

Review Timeline:

Submit Date:	7 Dec 2017
Revised Date:	14 May 2018
Accepted Date:	27 May 2018

Revision (0)

Here, you can see the **Reviewers**, **Associate Editors** and **EICs'** comments from the beginning to the end of the revision process.

Mohsen poursadeghiyan : Reviewer — 3 Jan 2018

Dear EIC:
This manuscript is very huge and large, and many parts must be shortened, and useful technical engineering sources must be used.
Best regards,

Somayeh Farhang Dehghan : Reviewer — 3 Feb 2018

Dear EIC:
This paper is a good review of the synthesis of Interpenetrating Polymer Networks Network for application in sound absorbent; however, it has some editing errors, and

should be revised. Moreover, there is an ambiguity about the novelty of the work, and the authors also need to address the mentioned questions and comments in the attached file to make the final decision to accept or reject the manuscript for publication.
Regards,

Leila omidi : Reviewer

12 Mar 2018

Dear Authors, the comments on this article are as follows:
Introduction
1. More information about the effects of sound exposures on human health is needed to add to the introduction section.
2. Please add more relevant literature related to the use of IPNs for sound reduction.
3. The authors had established the context of the paper—they had given an overview of the Interpenetrating Polymer Networks as a general topic, and they had synthesized a general review of studies on the usage and synthesis of IPNs. However, the authors have not clearly established what motivated them to do their research topic. Are they filling in a research gap, or are they extending a previous work on the topic?
Method
1. There are some typographical errors (in the whole manuscript), such as: The composition was prepared by reacting 1 equivalent...
2. Citations in the text tend to be limited. A sentence that states “The experimental methods based on ISO -10534-2 were used to determine the Sound absorption coefficient” should have one citation. Also, provide a reference for ASTM standards.
3. The numbering for each figure must be consecutive. Please change scheme 1 to fig 1.
4. For NETZSCH TG 209 F1 IRIS thermal analyzer and BSWA impedance, provide company and country names such as: Netzsch-TG 209 F1 Iris (Netzsch, Selb, Germany).
5. Please provide more information about choosing 85/15, 75/25 and 65/35 ratios for PU/PMMA.
Discussion
The discussion section needs more work, and more detailed comparisons with published literature (more results of other studies) are needed. A structured discussion is needed.

peymaneh habibi : Reviewer

13 Mar 2018

The idea of developing a new composite based on PU and PMMA polymerisation for acoustic applications is good; however, some sections of the paper are weak, and corrections should be addressed before publication. The overall contribution of the paper is considered satisfactory.
Abstract:
Comment 1:page 1 line 2: In the present study, the IPN networks of PU and PMMA

were prepared by using a sequential polymerization process with different ratios of PU/PMMA(85/15, 75/25, and 65/35).
--> In this study, polyurethane (PU)/poly(methyl methacrylate) (PMMA)-based interpenetrating polymer network (IPN) foams with different ratios of PU and PMMA (i.e., 85:15, 75:2,5, and 65:35) were prepared by in situ polymerisation.
Comment2:page 1 line 7: Viscoelastic parameters such as tan δ, glass transition temperature (Tg), and effective damping intervals (tanδ > 0.3) were also used as indicators for an effective damping ability.
--> As indicators of effective damping capability, viscoelastic parameters including loss factor (tan δ), glass transition temperature (Tg), and effective damping interval (tan δ > 0.3) were also determined.
Comment 3: To determine the rate of sound absorption coefficient in the prepared IPNs, - microphone impedance tube at the frequency of one octave was used.
-->The data doesn't look like one octave; it looks like a narrow band.
Comment 4: page 7 line 3: Synthesis of the PU/PMMA IPN is illustrated in Scheme 1.
-> Synthesis of the PU/PMMA IPN is illustrated in Figure 1.
Comment 5: The figure captions need to be improved in terms of language.
Comment 6: Please explain IPN and its constituents?

Ramazan Mirzaei : Associate Editor

14 Mar 2018

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Comment 1:page 1 line 2: In the present study, the IPN networks of PU and PMMA were prepared by using a sequential polymerization process with different ratios of PU/PMMA(85/15, 75/25, and 65/35).
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14 Mar 2018

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OPEN PEER REVIEW

Revision (1)

Reply to Reviewers

Ideally, the reviewing process can significantly improve the submitted manuscripts by allowing the authors to take into account the advice of reviewers. Author(s) must reply to all reviewers' comments in a separate Word file, point by point. A "**Reply to Reviewers**" document is submitted along with revised manuscript during submission of revised files, summarizing the changes that the authors made in response to the reviewers' comments. The responses to reviewers' comments specifies how the authors addressed each comment the reviewers made.

You can read the authors' responses to the reviewers' comments in the next page.

Dear Prof. Ramazan Mirzaei

The editor-in-chief of the Health Scope Journal

The author thanks from editor and the journal office for the on-time and desirable handling of our manuscript, and also for the constructive and valuable comments made by reviewers. After receiving the comments, the authors started to take into account all of those valuable comments point by point and tried to do our best to raise the manuscript level to reach the standards of the valuable journal of Health Scope. We also prepared the responses to all reviewers' comments, followed by this letter as "Response to reviewers' comments". All changes were made in the manuscript according to the reviewer's comments and indicated in red.

The authors appreciate your kind and prompt response regarding the submitted manuscript.

Sincerely,

Response to reviewers

Date: 14 March 2018

Manuscript ID Health Scope-64862

Manuscript Title: “Preparation of sound sound absorption based on Interpenetrating Polymer Network (PU/PMMA IPN)”

Reviewer: 1

Comments to the Author

This manuscript is very large, very parts must be shortened, and useful technical engineering sources must be used.

The authors would like to thank the area editor and the reviewers for their time and invaluable comments. We have carefully addressed all the comments. Some parts and sentences of the manuscript were removed, and the manuscript was shortened according to the referee’s comments. The corresponding changes and refinements made in the revised paper are summarized in our response below.

1- Please select this keyword based on the MESH of PubMed

 We agree with the reviewer’s advice and have therefore revised the keywords for clarity and to use the recommended term, as “Polyurethane, Poly (methyl methacrylate), Interpenetrated Polymer Networks (IPN), Damping characteristics, Sound absorption” was written.

2- Health scope is the name of this journal, and this part of health and noise pollution and other human health, is very briefly introduced in this part. I suggest that two references will be useful for improving the introduction

 Corrections were made according to the reviewer's comments, and two references were added in the introduction.

3- This part is very wide is pay attention to the technical and engineering of the material, etc. Please shorten and summaries this part and discuss whit health impact clearly at the end of the introduction.

 The introduction has been shortened, as can be seen in the

revised paper.

4- This part is the same as the previous part is huge, and very different sentences are used. Please, in one sentence, clearly mention of aim of this study.

 The materials and methods section has been shortened, as can be seen in the

revised paper.

Reviewer:2

This paper is a good review of the synthesis of Interpenetrating Polymer Networks

Network for application in sound absorbent; however, it has some editing errors, and should be revised. Moreover, there is an ambiguity about the novelty of the work, and the authors also need to address the mentioned questions and comments in the attached file to make the final decision to accept or reject the manuscript for publication.

 Thanks for the deep and very precise point of view of the reviewer.

Using interpenetrating polymer network for sound attenuation, referring to the 80s.

1- What is the novelty of the present work?

 Novelty of the present work relates to polymer compositions and methods of preparing them, having improved acoustic damping properties. More specifically, it relates to polymer mixtures comprising two components, a soft polymer component and a hard polymer component, which are intimately mixed on a molecular scale, such mixtures being referred to as "interpenetrating polymer networks.

2- What is the major gap in understanding that your work is attempting to fill?

 The major gap can be related to the preparation of sound-absorbing IPN foam with considering the other engineering properties such as damping, viscoelastic, and tensile properties.

3- Why is filling this gap important?

 One of the ways of vibration and noise reduction is the use of damping materials. Good damping material has high damping capacity in the frequency and temperature ranges of interest, high mechanical strength, and good thermal stability. The demand for high-performance polymer materials has posed a great challenge for scientists and engineers. The polyurethanes (PUR) and viscoelastic polymers can convert mechanical energy into heat undesirable properties of pure PUR, a narrow range of mechanical energy absorption, low mechanical strength, and poor heat resistance, can be improved by the preparation of interpenetrating polymer networks.

4- Absorption or adsorption??

 Absorption is true. Adsorption was replaced with absorption.

5- Semi-interpenetrated polymer network, define it?

 IPNs produced by different methods may be distinguished as follows:

(i) Sequential IPNs, where polymer network I is prepared first. Network I

swells in monomer II and cross-linking agent, and is then polymerized

. Thus, in sequential IPNs, the synthesis of one network follows the synthesis of the other.

(ii) Simultaneous IPNs, where the monomers or prepolymers and crosslinking agents for the synthesis of both networks are mixed. The

Reactions are carried out simultaneously. The crosslinking reaction must proceed according to different mechanisms to

avoid chemical interaction between the macromolecules of the two networks.

Usually, these mechanisms are polyaddition and radical polymerization

(A very rare case is anionic polymerization.)

(iii) Another very important class of IPNs is semi-IPNs, namely, systems in

Which one of the components is a linear polymer? Semi-IPNs may be characterized as sequential or simultaneous IPNs depending on the way the linear

polymer is introduced.

6- Select the better terms according to the main focus of the article.

Correction was done according to the reviewer's comments, and the corrected sentence as “Polyurethane, Poly (methyl methacrylate), Interpenetrated Polymer Networks (IPN), Damping characteristics, Sound absorption”, was written

7- All the manuscript needs an editorial correction.

 The manuscript was handled by a native English speaker for proofreading, which makes the manuscript more readable. We also tried to correct grammatical and syntax errors.

8- Connect two sentences with a proper conjunction.

 Correction was done according to the reviewer's comments, and an added statement marked as red in the introduction.

9- What does it mean that" IPNs can be formed simultaneously, sequentially, or by the latex technique"

 With simultaneous IPNs, all polymer systems are synthesized concurrently with no interfering

reactions occurring between them.

 With sequential IPNs, the polymers present in the mixture do not all synthesize at the same time.

10- Unnecessary literature review. Summaries them.

 The correction was done according to the reviewer's comments.

11- The literature review has been shortened, as can be seen in the

revised paper.

 The correction was done according to the reviewer's comments.

12- Please provide a clear scientific justification for your work in relation to the objectives included in the introduction.

 Correction was done according to the reviewer's comments, and an added statement marked as red in the conclusion section.

Reviewer:3

1- More information about the effects of sound exposures on human health is needed to add to the introduction section.

 Corrections were made according to the reviewer's comments and the rewritten statement was marked in red in the introduction.

2- Please add more relevant literature related to the use of IPNs for sound reduction.

 Some of the articles are referred to in the introduction, as well as justify the results. For example [6-1], 18, [21-22], 27.

3- The authors had established the context of the paper—they had given an overview of the Interpenetrating Polymer Networks as a general topic, and they had synthesized a general review of studies on the usage and synthesis of IPNs. However, the authors have not clearly established what motivated them to do their research topic. Are they filling in a research gap, or are they extending a previous work on the topic?

 Novelty of the present work relates to polymer compositions and methods of preparing them, having improved acoustic damping properties. More specifically, it relates to polymer mixtures comprising two components, a soft polymer component and a hard polymer component, which are intimately mixed on a molecular scale, such mixtures being referred to as "interpenetrating polymer networks.

 One of the ways of vibration and noise reduction is the use of damping materials Good damping material has high damping capacity in the frequency and temperature ranges of interest, high mechanical strength, and good thermal stability. The demand for high-performance polymer materials has posed a great challenge for scientists and engineers. The polyurethanes (PUR) and viscoelastic polymers are able to convert mechanical energy into heat undesirable properties of pure PUR, a narrow range of mechanical energy absorption, low mechanical

strength, and poor heat resistance, can be improved by the preparation of interpenetrating polymer networks.

Method

4- There are some typographical errors (in the whole manuscript), such as: The composition was prepared by reacting 1 equivalent…

 Corrections were made according to the reviewer's comments.

5- Citations in the text tend to be limited. A sentence that states “The experimental methods based on ISO -10534-2 were used to determine the Sound absorption coefficient” should have one citation. Also, provide a reference for ASTM standards.

 Corrections were made according to the reviewer's comments.

6- The numbering for each figure must be consecutive. Please change scheme 1 to fig 1.

 Correction was done according to the reviewer's comments and the corrected sentence as “Synthesis of the PU/PMMA IPN is illustrated in Figure 1.” was written.

7- For NETZSCH TG 209 F1 IRIS thermal analyzer and BSWA impedance, provide company and country names such as: Netzsch-TG 209 F1 Iris (Netzsch, Selb, Germany).

 Corrections were made according to the reviewer's comments.

8- Please provide more information about choosing 85/15, 75/25 and 65/35 ratios for PU/PMMA.

 This range is selected based on our bibliography for synthesizing PMMA/PU IPNs and our experimental basic essays. However, the experimental section, i.e., initial materials and preparation route in the studied article, is somewhat different. Therefore, it needs the effects of molar ratio components by various tests, such as DMA, tensile, and sound absorption, are investigated for designing an engineering material and a base for further studies in the future.

Discussion

9- Discussion section needs more work, and more detailed comparisons with published literature (more results of other studies) are needed. A structured discussion is needed.

 Correction was done according to the reviewer's comments, and an added statement marked as red in the conclusion section.

10- The first paragraph of the Discussion should provide a perspective for readers to remind them of the importance of your study.

 Correction was done according to the reviewer's comments, and an added statement marked as red in the conclusion section.

Reviewer: 4

The idea of developing a new composite based on PU and PMMA polymerization for acoustic applications is good; however, some sections of the paper are weak, and corrections should be addressed before publication. The overall contribution of the paper is considered satisfactory.

 Thanks for the deep and very precise point of view of the reviewer.

Abstract:

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Comment 2: page 1 line 7: Viscoelastic parameters such as tan δ, glass transition temperature (Tg), and effective damping intervals (tanδ > 0.3) were also used as indicators for an effective damping ability.

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Comment 3: To determine the rate of sound absorption coefficient in the prepared IPNs, - two-microphone impedance tube at the frequency of one octave was used.

- It is true. One octave was replaced with a narrow band.

Comment 4: page 7 line 3: Synthesis of the PU/PMMA IPN is illustrated in Scheme 1.

- Correction was done according to the reviewer's comments and the corrected sentence as “Synthesis of the PU/PMMA IPN is illustrated in Figure 1.” was written.

Comment 5: Please explain IPN and its constituents.

- An interpenetrating polymer network, lPN, can be defined as a combination of two polymers in network form, at least one of which is synthesized and/or crosslinked in the immediate presence of the other. An IPN can be distinguished from simple polymer blends, blocks, and grafts in two ways: (1) An IPN swells, but does not dissolve in solvents, and (2) creep and flow are suppressed.

OPEN PEER REVIEW

Revision (1)

Ramazan Mirzaei : Associate Editor — 26 May 2018

Dear Editor-in-Chief:
The manuscript had been revised based on the reviewers' comments.

Ramazan Mirzaei : EIC — 27 May 2018

Dear EIC:
The manuscript had been revised based on the reviewers' comments.