



SDI Review Form 1.6

Journal Name:	<u>AmericanChemicalScienceJournal</u>
Manuscript Number:	Ms_ACSj_20043
Title of the Manuscript:	Effect of Plasticizer on the Structural and Transport Properties of Mg²⁺- Ion Conducting Solid Polymer Electrolytes: [PEO: Mg(CH₃COO)₂]
Type of the Article	

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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PART 1: Review Comments

	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)
Compulsory REVISION comments	In the submitted paper entitled “ Effect of Plasticize on the structural and transport Properties of Mg^{2+} -Ion conducting Solid Polymer electrolytes: PEO :$Mg(CH_3COO)_2$], authors has tried to establish the effect of single plasticizer (ie Ehylene Glycol EG), studied by optical microscopy, FTIR and Impedance spectroscopy. In this study following important points need to answer by the authors – In the material and method Section, the amount (%) of EG (or composition dependance study) is not mentioned. – In line 69, one pot study and in 71 solution cast study is given for the synthesis of film. Authors should clarify the actual experimental technique used for the synthesis of film. – In the FTIR study, the nature of fig 3(a), (b) is different than 3(c) ie 15% salt composition. The peaks with minimum intensity or completely vanishes. Authors are unable to explain the abrupt change/ decrease in intensity. In fig 4 (without EG)	- 50 ml (50%) EG and 50 ml (50%) deionized water. - The reaction between PEO, Mg $(CH_3COO)_2$ and mixture of water and EG was done inside a pot (crucible) and hence the name one-pot reaction. Subsequently film casts were made from the resulting solution into Petri dishes and hence the name solution casting. - The extinction of some peaks was noticed in the sample, but this behaviour is the finger print of the particular sample. Just like the other samples have their peculiar finger prints. Nevertheless, explanation regarding hydrolysis and oxidation had already been given in the manuscript.



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	no similar change was observed. – The temperature dependance of conductivity shown in figure 5, 6 and 7 are not correct due to following reasons – (a) In fig 5 the value of conductivity varies from 0 S/cm to 3 S/cm in temperature range RT to 65°C for 15% salt composition. Similar results are given in fig 6 with Ln conductivity. – (b) These figures show the continuous decrease in conductivity with temperature due to the size of mobile species. This aspect of conductivity change is ignored by the authors. But in the text the mentioned values of conductivity is 0.193 S/cm at 338 °C. – (c) In material and method Section, line 80 “ionic conductivity..... from room temperature to 65 °C” and in line no 249 “conductivity at 345K” means 72 °C. Both lines are contradicting to each others. – (d) No experimental evidence present regarding the reduction of activation energy (line no. 250-253) – (e) In table 1 all the values given are at 65 °C (last point of study or near the phase transition). These values does not support the results given in figure and text. On the basis of above comment this paper need a major revision before the publication.	The temperature dependence conductivity shown in figures 5, 6 and 7 are very correct for the following reasons - The values of conductivity varies from slightly greater than 0 S/cm to about 3 S/cm in the temperature ranging from RT to 65°C for 15% salt. - This is quite obvious from the figures and Continuous decrease in conductivity with temperature due to the size of mobile species has been included in the manuscript. - Thank you for this careful scrutiny. It is actually from RT to 65°C and this has been corrected. - The reason for this reduction was stated in the manuscript “smoother morphologies of the films upon addition of Ethylene glycol [CH₂(OH).CH₂OH]”. - The values are all correct and they are: 0.054 S/cm , 0.125 S/cm, 0.193 S/cm, 0.033 S/cm and 0.023 S/cm.
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