Review Form 1.7

Journal Name:	**Journal of Materials Science Research and Reviews**
Manuscript Number:	**Ms_JMSRR_104810**
Title of the Manuscript:	**Dependence of the Seebeck Coefficient on Specific and Universal Electrical Conductivities of Bi2Sr2Co1.8Oy Thermoelectric Doped with Strontium Borate and Graphene**
Type of the Article	**Short communication**

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 **1. Is the manuscript important for scientific community?** (Please write few sentences on this manuscript) **2. Is the title of the article suitable?** (If not please suggest an alternative title) **3. Is the abstract of the article comprehensive?** **4. Are subsections and structure of the manuscript appropriate?** **5. Do you think the manuscript is scientifically correct?** **6. Are the references sufficient and recent? If you have suggestion of additional references, please mention in the review form.** **(Apart from above mentioned 6 points, reviewers are free to provide additional suggestions/comments)**	**Yes** **Yes** **No: the abstract should be rephrased and contain the main results with the main characterization mean.** **Yes** **Yes** **References are relevant but more references are needed for the discussion**	
Minor REVISION comments **1. Is language/English quality of the article suitable for scholarly communications?**	Sufficient but need some rephrasing on some sentences and a thorugh reading would help a lot.	
Optional/General comments	Although it is short communication article, it still needs clarification to make sure that the article is read by accurate information. Abstract … **Please write two sentences regarding the motive of the study and seebeck effect, here.** The paper considers the dependences of the Seebeck coefficient on the specific and universal electrical conductivities in $Bi_2Sr_2Co_{1.8}O_y$ thermoelectric with $Sr(BO_2)_2$ dopant and Graphene additive. It is shown that the dependences of the Seebeck coefficient on the electrical conductivity in this thermoelectric both with the addition of graphene and with the dopant of strontium borate are rectilinear for individual samples. The dependences of the Seebeck coefficient on the universal electrical conductivity exhibit a power-law character, but their form is practically independent of the dopant and additive concentrations. The temperature dependences of the electronic quality factor (B_E) are also investigated. An increase of B_E with temperature indicates the presence of effects of additional scattering and band convergence. **Please revise and rephrase the sentence below:** …It is shown that the dependences of the Seebeck coefficient on the electrical conductivity in this thermoelectric ???Property?? both with the addition of graphene and with the dopant of strontium borate are rectilinear for individual samples.... Introduction … **Introduction is rather short and insufficient; focused on the mathematical expressions rather than materials property itself. It needs more detailed information about the Seebeck effect observed in similar compounds and in general.** **Please provide the names of the dopants and additives used as shown below** ... S is the Seebeck coefficient)) dopants and additives are used, FOR EXAMPLE X2YB3 and	

	Graphite etc... [3-5]. **Please provide following information.** … these characteristics of the $Bi_2Sr_2Co_{1.8}O_y$ thermoelectric (?: compound/matter/mixture etc..). Experimental Section **.. Please use either K or C units in this section and throughout the manuscript.** **..How did you choose the temperatures for calcination and sintering? Any references?** **I assume at such a high temperature of sintering, there must be unpredicted reactions which are very crucial for the study. The authors stated that "**The phase purity and microstructure of the prepared materials were examined using X-ray diffraction (Dron–3M, CuKα–radiation) and scanning electron microscopy (VEGA TS5130MM) techniques." **However, there are no such results in the manuscript. These should be added to the manuscript. This study is no complete without them.** Results **The introduction to this section needs a little of elaboration such as make sure that the reader is filled with the content of equation and meaning of outcomes etc...** **Please rewrite the sentence below for clarity.** Study the dependence $S\text{-}\sigma^{-2/3}$ shows that the variable coefficient $C=S\sigma^{2/3}$ changes small with temperature for the samples under study. **Please state the figure number at this sentence not at the end of paragraph. In addition, please elaborate more on the relationship between elec trical conductivity and Seebeck coefficient variations at this stage, for clarity.** It should be noted that the comparative narrowness of the diapazone of the change of S (1.05-1.78 $V{\cdot}K^{-1}$) makes it possible to consider the dependence of the Seebeck coefficient on the electrical conductivity for our samples in a simpler way.... **Please explain why equation 5 was introduced; and give details about the content of equation and relation with the subject.** **In fig 1, there are codes as 1, 2, 3, 4, 5 and 6 on curves; what do they correspond to? Please provide the key in Table 1, too.** **In fig 1, if y axis is intersected by the effect of extrapolation, which is b (mx (tan value) + b), however, the b in Table 1 one is denoted as negative, which does not make sense because the m value for the lines is positive. How did you find the values at the right column, explain please.** **Please make a statement how temperature is clearly affecting the results as in:** ..." Since σ and S depend on temperature, an increase in the latter leads to an increase in the power factor exclusively for all samples..". **There is no such result here regarding the effect of temperature versus S values for each mixture. If possible provide such information.** **Figure 3 is much generalized form of dependencies without regards to temperature and additives; it is reasonably good data but which data belongs to which samples should be given/marked. Authors should discuss how accurate this data and margins of error should be mentioned in detail.**	

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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?	*(If yes, Kindly please write down the ethical issues here in details)*	

Reviewer Details:

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