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Comment

Comments on the paper "Structure, electric and dielectric properties of $PbFe_{1/3}Ti_{1/3}W_{1/3}O_3$ single perovskite compound" by P.G.R. Achary, R.N.P. Choudhary, S.K. Parida, published in Processing and Application of Ceramics 14 (2020) 146–153

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Abstract

My comments concern the errors in the crystallographic part and possible misconduct of the authors of the commented paper regarding their usage of the same SEM image in different subsequent works. Moreover, the true chemical composition of the studied sample is questionable since the authors claim different systems for the same SEM micrograph in five different papers mentioned here.

Keywords: *perovskite, SEM images, errors*

There are many papers devoted to different crystals with interesting physical properties. Several papers were published by the team of prof. Ram Narayan Prasad Choudhary and Santosh Kumar Parida from the ITER Institute, "Deemed to be University", Bhubaneswar, Odisha, India. The commented paper [1] is the first in the series of five papers by the same authors and published in the period 2020–2022.

There are three different papers (Paper 1, Paper 2 and Paper 3) devoted to different compounds/crystals, but with the SEM micrographs (taken on 24 Feb. 2020) of the same part of the same sample. This is the same sample, but with subsequent higher magnification from 2000× to 10000×.

Paper 1:

P.G.R. Achary, R.N.P. Choudhary, S.K. Parida, "Structure, electric and dielectric properties of $PbFe_{1/3}Ti_{1/3}W_{1/3}O_3$ single perovskite compound", *Process. Appl. Ceram.*, **14** [2] (2020) 146–153; DOI: 10.2298/PAC2002146A; submitted on 21 Nov. 2019, in revised form on **10 April 2020**.

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It is important to know, that the SEM image appeared just in the revised version (included upon the request of one reviewer).

Paper 2:

S.K. Parida, R.N.P. Choudhary, "Preparation method and cerium dopant effects on the properties of $BaMnO_3$ single perovskite", *Phase Transitions*, **93** [10-11] (2020) 981–991; DOI: 10.1080/01411594.2020.1817451; submitted on **13 June 2020**.

This paper was commented in the journal Phase Transitions by Tomaszewski [2], "Comment on the paper "Preparation method and cerium dopant effect on the properties of $BaMnO_3$ single perovskite" by S.K. Parida and R.N.P. Choudhary published in "Phase Transitions" 93, 981 (2020)" (DOI: 10.1080/01411594.2021.1971667).

Paper 3:

S.K. Parida, M.K. Swain, R.K. Bhuyan, B. Kisan, R.N.P. Choudhary, "Effect of cerium on structural and dielectric properties of modified $BiFeO_3$-$PbTiO_3$ ceramics for photovoltaic applications", *J. Electronic Mater.*, **50** (2021) 4685–4695; DOI: 10.1007/s11664-021-09016-1; submitted on **25 November 2020**.

The Editor-in-Chief has retracted this article. After publication, concerns were raised that the SEM image in Fig. 1b overlaps with that in Fig. 1b in Ref. [1]. **Retraction Note:** "Effect of cerium on structural and dielectric properties of modified $BiFeO_3$-$PbTiO_3$ ceramics for photovoltaic applications", *J. Electronic Mater.*, **51** (2022) 4106; DOI: 10.1007/s11664-022-09649-w; retracted on 25 April 2022.

There are also two other papers (Paper 4 and Paper 5) with the SEM images of other parts of the same sample, as I suppose. The crystals have the similar habit and the time of SEM experiments are nearly the same as in the case of previous images.

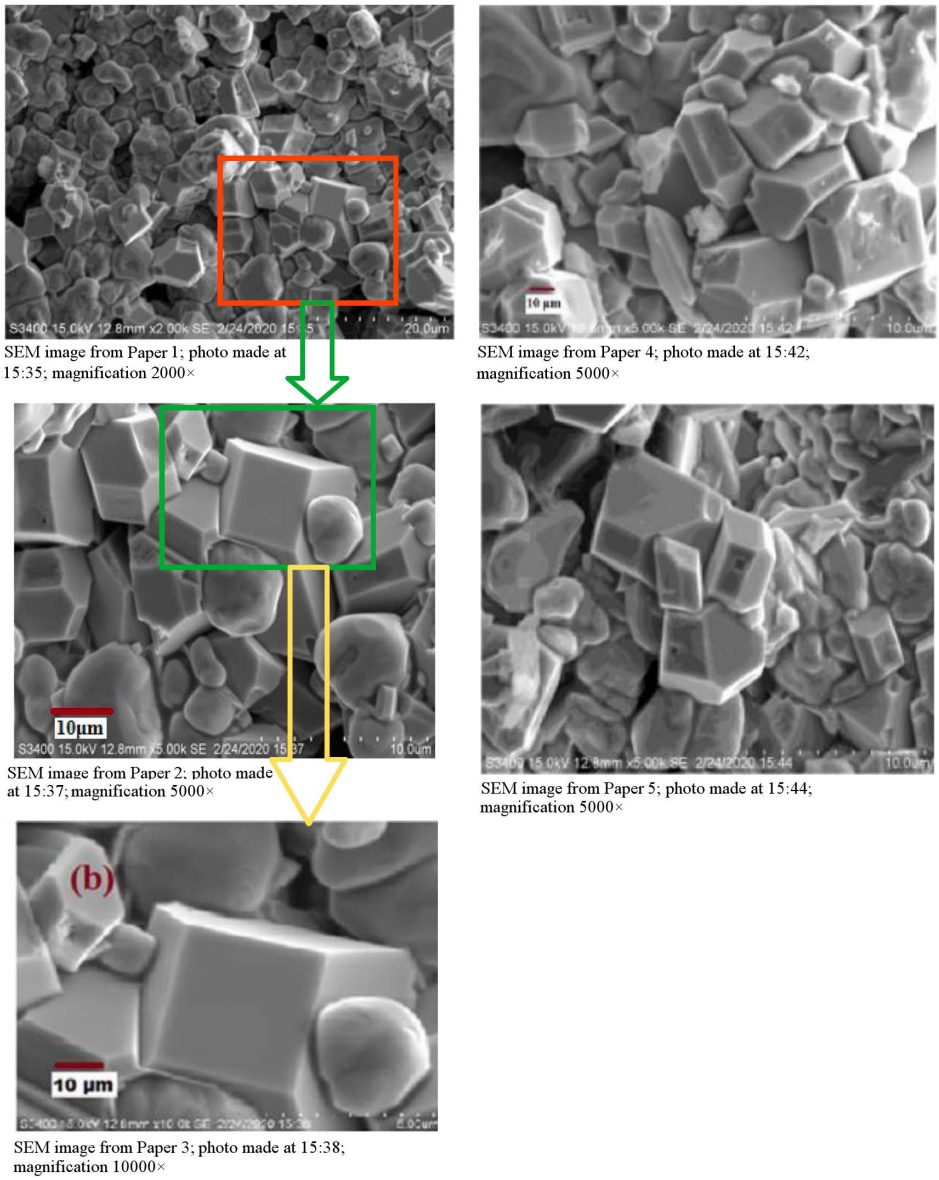
Paper 4:

P.G.R. Achary, S. Khandai, P. Sahoo, R.K. Bhuyan, R.N.P. Choudhary, S.K. Parida, "Structural, dielectric and impedance spectroscopy of cerium doped $BaMnO_3$ single perovskite", *Research Square*, (2020); DOI:10.21203/rs.3.rs-95121/v1; submitted on **23 October 2020** (fortunately, this preprint was retracted by authors but it could still be found on the internet).

Paper 5:

R.P. Parida, B. Parida, R.K. Bhuyan, S.K. Parida, "Structural, mechanical and electric properties of La doped BNT-BFO perovskite ceramics", *Ferroelectrics*, **571** (2021) 162–174; DOI: 10.1080/00150193.2020.1853751; submitted on **16 April 2020**.

Note that all papers were submitted in the period from 10 April to 25 November of the same year, 2020. The relations between these SEM images are presented in Fig. 1. It is evident that the authors used the same SEM images intentionally in five different papers. Therefore, it is not clear what is the crystal presented in this series of SEM pictures. Moreover, it is not necessary to show and discuss other errors in the crystallographic parts of the



SEM image from Paper 1; photo made at 15:35; magnification 2000×

SEM image from Paper 4; photo made at 15:42; magnification 5000×

SEM image from Paper 2; photo made at 15:37; magnification 5000×

SEM image from Paper 5; photo made at 15:44; magnification 5000×

SEM image from Paper 3; photo made at 15:38; magnification 10000×

Figure 1. SEM images presented in five different papers

commented papers. In my opinion, the manipulation can be sufficient to decide on the retraction of all discussed papers.

The SEM micrographs shown in these papers are attributed to the following crystals:

Paper 1 $PbFe_{1/3}Ti_{1/3}W_{1/3}O_3$
Paper 2 $BaMn_{0.94}Ce_{0.06}O_3$
Paper 3 $BiFeO_3$-$PbTiO_3$
Paper 4 $BaMnO_3$:Ce (10% of Ce)
Paper 5 $Bi_{0.5}Na_{0.5}TiO_3$-$BiFeO_3$:La

How is it possible to show the SEM images from the same sample as the images of different crystals? It seems that the authors have a kind of bank of beautiful images used if it is necessary to insert any images.

Moreover, it is not clear that the presented chemical formulae are correct. For example, the crystal described in the Paper No. 5 is a pure $BiFeO_3$ in its orthorhombic phase instead of La doped BNT-BFO ceramics as stated by the authors. The published X-ray diffraction pattern proves this conclusion.

As a result, all subsequent experimental data (from dielectric, magnetic, etc. experiments) do not have any scientific value, as they are measured on the samples of unknown chemical composition.

Moreover, the diffraction pattern showed in Figures 1 and 2 of the commented paper [1] clearly shows that the structure refinement is not correct. The first of all, the reliability factor is very high (R_{wp} = 15%) and the red curve (theoretical line) does not fit the experimental pattern (black line). Why the authors stated close matching of both patterns? Thus, the values of lattice parameters as well as crystal symmetry can be considered incorrect.

References

1. P.G.R. Achary, R.N.P. Choudhary, S.K. Parida, "Structure, electric and dielectric properties of $PbFe_{1/3}Ti_{1/3}W_{1/3}O_3$ single perovskite compoun", *Process. Appl. Ceram.*, **14** [2] (2020) 146–153.
2. P.E. Tomaszewski, "Comment on the paper "Preparation method and cerium dopant effect on the properties of $BaMnO_3$ single perovskite" by S.K. Parida and R.N.P. Choudhary published in "Phase Transitions" 93, 981 (2020)", *Phase Trans.*, **94** (2021) 776–778.