

Accepted Manuscript

New silicate-germanate $\text{Cs}_2\text{Pb}_2[(\text{Si}_{0.6}\text{Ge}_{0.4})_2\text{O}_7]$ from the series $\text{A}_2\text{Pb}_2[\text{B}_2\text{O}_7]$, A = K, Cs, B = Si, Ge with the umbrella-like $[\text{PbO}_3]^{4-}$ group

Elena L. Belokoneva, Ivan A. Morozov, Anatoly S. Volkov, Olga V. Dimitrova, Sergey Yu. Stefanovich

PII: S1293-2558(17)31087-7

DOI: [10.1016/j.solidstatesciences.2018.02.012](https://doi.org/10.1016/j.solidstatesciences.2018.02.012)

Reference: SSSCIE 5638

To appear in: *Solid State Sciences*

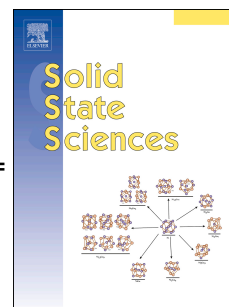
Received Date: 10 November 2017

Revised Date: 16 February 2018

Accepted Date: 19 February 2018

Please cite this article as: E.L. Belokoneva, I.A. Morozov, A.S. Volkov, O.V. Dimitrova, S.Y. Stefanovich, New silicate-germanate $\text{Cs}_2\text{Pb}_2[(\text{Si}_{0.6}\text{Ge}_{0.4})_2\text{O}_7]$ from the series $\text{A}_2\text{Pb}_2[\text{B}_2\text{O}_7]$, A = K, Cs, B = Si, Ge with the umbrella-like $[\text{PbO}_3]^{4-}$ group, *Solid State Sciences* (2018), doi: 10.1016/j.solidstatesciences.2018.02.012.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Solid State Sciences
Manuscript Draft Revised

Manuscript Number: SSSCIE_2017_948

Title: New silicate-germanate $\text{Cs}_2\text{Pb}_2[(\text{Si}_{0.6}\text{Ge}_{0.4})_2\text{O}_7]$ from the series $\text{A}_2\text{Pb}_2[\text{B}_2\text{O}_7]$, A = K, Cs, B = Si, Ge with the umbrella-like $[\text{PbO}_3]^{4-}$ group

Article Type: Full Length Article

Keywords: Silicate-Germanate $\text{Cs}_2\text{Pb}_2[(\text{Si}_{0.6}\text{Ge}_{0.4})_2\text{O}_7]$; Hydrothermal Synthesis; Single Crystal Structure; Umbrella-like $[\text{PbO}_3]^{4-}$ group, Structural Relations

Abstract: New silicate-germanate $\text{Cs}_2\text{Pb}_2[(\text{Si}_{0.6}\text{Ge}_{0.4})_2\text{O}_7]$ was synthesized in multi-components hydrothermal solution with 20 w.% concentration of Cs_2CO_3 mineralizer, pH =10. Novel mixed compound belongs to the structure type $\text{A}_2\text{Pb}_2[\text{B}_2\text{O}_7]$ previously indicated for powders with A=K, B=Si or Ge. Single crystal structure determination of $\text{Cs}_2\text{Pb}_2[(\text{Si}_{0.6}\text{Ge}_{0.4})_2\text{O}_7]$ revealed the need for the correction of the space group of the earlier suggested structural model from $P-3$ to $P-3m1$, as well as for the splitting of the Pb-atom position. Umbrella-like groups $[\text{PbO}_3]^{4-}$ are located between $[(\text{Si,Ge})\text{O}_4]^{4-}$ tetrahedra in mica-like honeycomb layers and play the role of tetrahedra with the Pb-lone-pair as the forth apex. Crystal chemical comparison revealed similarities and differences with the classical structure type of α -celsian $\text{Ba}[\text{Al}_2\text{Si}_2\text{O}_8]$ with the tetrahedral double layer. Recently investigated nonlinear optical acentric borates $\text{Pb}_2(\text{BO}_3)(\text{NO}_3)$ and $\text{Pb}_2(\text{BO}_3)\text{Cl}$ are both related to this structural type, possessing umbrella-like groups $[\text{PbO}_3]^{4-}$ and honeycomb layers $[\text{Pb}_2(\text{BO}_3)]^+$ with the BO_3 -triangles on the tetrahedral positions.

Download English Version:

<https://daneshyari.com/en/article/7914525>

Download Persian Version:

<https://daneshyari.com/article/7914525>

[Daneshyari.com](https://daneshyari.com)