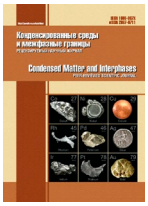

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Condensed Matter and Interphases
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Review/Research article/Short communication
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Modelling of interdiffusion and phase formation in thin-film two-layer systems of polycrystalline oxides of titanium and cobalt

(All proper nouns should be capitalized; titles and subtitles should be left-aligned)

N. N. Afonin[1]✉, V.A. Logacheva[2]

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The abstract should be 200-250 words and include the following sections.

Purpose: States the problem considered in the article, its importance, and the purpose of the research.

Experimental: Provides information about the objects being studied and the methods used.

Conclusions: Provides a brief description of the principal results, major conclusions, and their scientific and practical relevance.

Keywords: Please, provide 5-10 keywords for the principal concepts, results, and terms used in the article.

Funding: The study was funded by the Russian Science Foundation, research project No.

Acknowledgments: The DTATGA, XRD and SEM studies were performed on the equipment of the Engineering Center of Saint Petersburg State Institute of Technology.

For citation: Afonin N. N., Logacheva V. A. Modelling of interdiffusion and phase formation in the thin-film two-layer system of polycrystalline oxides of titanium and cobalt. *Condensed Matter and Interphases*. 2025;27(1): 000-000. https://doi.org/10.17308/kcmf.2025.27/000

✉ Nikolay N. Afonin, e-mail: nafonin@vspu.ac

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The introduction (1–2 pages) states the problem under consideration, its relevance, and the most important tasks that need to be resolved. Describe the scientific problems which have not yet been solved and which you sought to solve in your research. The introduction should contain a short critical review of previously published works in this field and their comparative analysis. It is recommended that the analysis is based on 20–30 studies (no more than 20% of references to the author's own works, at least 50% of the references should be to articles published within the previous 5 years). **The purpose** of the article is indicated by the problem statement.

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Example of references in-text citations:

Single crystals of difluorides of alkaline earth elements are widely used as photonics materials [1–3] as well as matrices for doping with rare-earth ions [4,10].

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At the end of the Conclusions the authors should include notes that explain the actual contribution of each co-author to the work.

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Nikolay N. Afonin – Scientific management, Research concept, Methodology development, Writing – original draft, Final conclusions.

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The authors contributed equally to this article.

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The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

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2. Alexandrov A. A., Mayakova M. N., Voronov V. V., Pominova D. V., Kuznetsov S. V., Baranchikov A. E., Ivanov V. K., Fedorov P. P. Synthesis upconversion luminophores based on calcium fluoride. *Condensed Matter and Interphases*. 2020;22(1): 3–10. https://doi.org/10.17308/kcmf.2020.22/2524

3. Kopeychenko E. I., Mittova I. Y., Perov N. S., Alekhina Y. A., Nguyen A. T., Mittova V. O., Pham V. Synthesis, composition and magnetic properties of cadmium-doped lanthanum ferrite nanopowders. *Inorganic Materials*. 2021;57(4): 367–371. https://doi.org/10.1134/S0020168521040075

Book: print

4. Nakamoto K. *Infrared and Raman spectra of inorganic and coordination compounds*. New York: John Wiley; 1986. 479 p.

5. Fedorov P. P., Osiko V. V. Crystal growth of fluorides. In: *Bulk Crystal Growth of Electronic. Optical and Optoelectronic Materials*. P. Capper (ed.). Wiley Series in Materials for Electronic and Optoelectronic Applications. John Wiley & Son. Ltd.; 2005. pp. 339-356. https://doi.org/10.1002/9780470012086.ch11

6. *Nanostructured oxide materials in modern micro-, nano- and optoelectronics*. V. A. Moshnikov, O. A. Aleksandrova (eds.). Saint Petersburg: Izd-vo SPbGETU "LETI" Publ., 2017. 266 p. (in Russ.)

Conference proceeding: individual paper

7. Afonin N. N., Logacheva V. A., Khoviv A. M. Synthesis and properties of functional nanocrystalline thin-film systems based on complex iron and titanium oxides. In: *Amorphous and microcrystalline semiconductors: Proc. 9th Int. Conf., 7–10 July 2014*. St. Petersburg: Polytechnic University Publ.; 2014. p. 356–357. (In Russ.)

Website

8. NIST Standard Reference Database 71. *NIST Electron Inelastic-Mean-Free-Path Database: Version 1.2*. Available at: www.nist.gov/srd/nist-standard-reference-database-71

Patent

9. Chekanov V. V., Kandaurova N. V., Rakhmanina Yu. A., Chekanov V. S. *Ultrasound indicator 2*. Patent RF, no. 2446384, 2012. Publ. 27.03.2012, bull. no. 9. (In Russ.)

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Example:

Fig. 1. Dependences of the parameters *a* and *c* of the tetragonal lattice of nanocrystalline PdO films on the oxidation temperature T_{ox}: *1* – single-phase PdO films, *2* – heterophase PdO + Pd films; *3* – data of the ASTM standard [22, 23]

Table 1. The values of relative electronegativity (ENE) of some chemical elements [30] and the proportion of the ionic component of the chemical bond in binary compounds of the AB composition formed by these elements

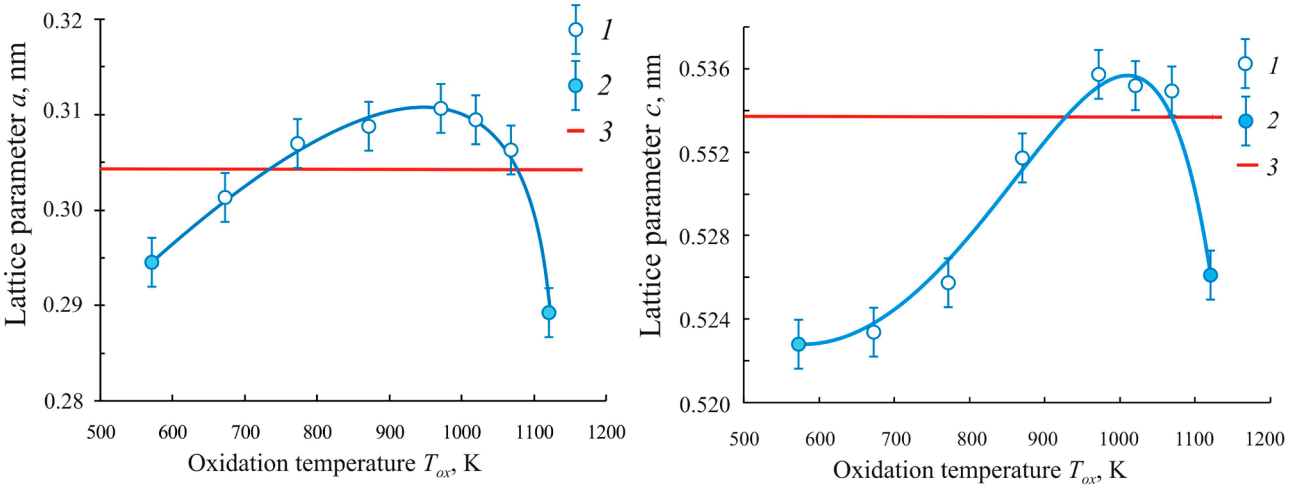

Fig. 1. Dependences of the parameters *a* and *c* of the tetragonal lattice of nanocrystalline PdO films on the oxidation temperature T_{ox}: *1* – single-phase PdO films; *2* – heterophase PdO + Pd films; *3* – data of the ASTM standard [22, 23]

Table 1. Values of the ionic radii of palladium Pd^{2+} and oxygen O^{2-} [30–32]

Ion	Coordination number CN	Coordination polyhedron	Values of ionic radii R_{ion}, nm
Pd^{2+}	4	Square (rectangular)	0.078 [30]; 0.086 [31]; 0.078 [32]
O^{2-}	4	Tetragonal tetrahedron	0.132 [30]; 0.140 [31]; 0.124* [31]; 0.132 [32]

*The values of ionic radius were obtained on the basis of quantum mechanical calculations.

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