

Viktor N. Zoryansky (Viktor Zorianskyi)

Candidate in Physics and Mathematics

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Main place of work:

Research Associate at the Department of Thermal properties and structure of Solids and nanosystems of B.I. Verkin Institute for Low Temperature Physics and Engineering, NASU.



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Date and place of birth

23 April 1979, Izyum, Kharkiv region, Ukraine (former USSR)

Citizenship:

Ukraine

Research Profile:

Study of the peculiarities of the crystal structure and low-temperature photoluminescence of C₆₀ fullerite films, elucidation of the mechanism of transport and localization of electronic excitations, complex structural and optical low temperature studies of the properties of carbon nanostructures of the fullerene series doped with various chemically neutral particles.

Scientific activities:

14 publications in refereed International Journals

34 publications in Proceedings of International Conferences

Education:

- 2013 - Candidate in Physics and Mathematics (analogous to PhD), B.I. Verkin Institute for Low Temperature Physics and Engineering, National Academy of Sciences of Ukraine, Kharkov, Ukraine. Dissertation Title "Photoluminescence of pure C₆₀ fullerite and intercalated with helium and molecular hydrogen" in the specialty 01.04.07 "Solid State Physics".
- 2001 - Graduated as MS in physics (with honors) from V.N. Karazin Kharkiv National University, Department of Physics, Kharkiv, Ukraine.

Employment:

- 2017 - present: Research Associate at the Department of Thermal properties and structure of Solids and nanosystems of B.I. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine, Kharkiv, Ukraine.
- 2004 – 2017: Researcher at the Department of Thermal properties and structure of Solids and nanosystems of B. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine, Kharkiv, Ukraine.
- 2001 – 2004: full-time graduate student (B.I. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine, Kharkiv, Ukraine).

Main results:

- For the first time, the role of mechanical deformations of C_{60} thin films of different crystal structure in changing the mechanism of transport and localization of Frenkel excitons was experimentally determined;
- For the first time, a shift in the glass transition phase of intercalated by molecular hydrogen fullerite C_{60} was revealed, in the region of high temperatures;
- For the first time, the existence of two mechanisms of nitrogen and hydrogen sorption into the C_{60} fullerite crystal lattice was confirmed by structural and luminescence methods.

Main publications

- [1] Legchenkova I. V., Prokhvatilov A. I., Stetsenko Yu. E., Strzhemechny M. A., Yagotintsev K. A., Avdeenko A. A., Eremenko V. V., Zinoviev P. V., Zoryansky V. N., Silaeva N. B., Ruoff R. S., Structure and photoluminescence of helium-intercalated fullerite C_{60} , Low Temperature Physics, 28, 942 (2002). DOI <https://doi.org/10.1063/1.1531399>
- [2] P. Zinoviev, V. Zoryansky, and N. Silaeva, Photoluminescence of C_{60} single crystals intercalated with molecular hydrogen, Low Temp. Phys. 34, 484 (2008). DOI <https://doi.org/10.1063/1.2920183>
- [3] P. Zinoviev, V. Zoryansky, N. Silaeva, Yu. Stetsenko, M. Strzhemechny, and K. Yagotintsev, Orientational glassification in fullerite C_{60} saturated with H_2 : photoluminescence studies, Low Temp. Phys. 38, 732 (2012). DOI <https://doi.org/10.1063/1.4746795>
- [4] K. Yagotintsev, I. Legchenkova, Yu. Stetsenko, P. Zinoviev, V. Zoryansky, A. Prokhvatilov, and M. Strzhechny, Saturation of fullerite C_{60} with hydrogen: Adsorption crossover studies, Low Temp. Phys. 38, 952 (2012). DOI <https://doi.org/10.1063/1.4758781>
- [5] P. Zinoviev, V. Zoryansky, Y. Stetsenko, and V. Danchuk, Specific features of the glass transition in C_{60} fullerite saturated with carbon monoxide molecules: Photoluminescence studies, Low Temp. Phys. 42, 133, (2016). DOI <https://doi.org/10.1063/1.4942396>
- [6] P. Zinoviev, and V. Zoryansky, Low-temperature photoluminescence of C_{60} single crystals intercalated with nitrogen molecules in the wide range of temperatures, Low Temp. Phys. 47, 173, (2021). DOI <https://doi.org/10.1063/10.0003180>