

**SCIENTIFIC SCHOOL OF ACADEMICIAN Y.D. TRETYAKOV
IN THERMODYNAMICS AND MATERIALS SCIENCE**

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Scientific School of academician Y.D.Tretyakov has manifested itself as a platform of alloying fundamental and practices – oriented research directions in inorganic, physical, solid state chemistry and materials sciences and it still plays a unique role in modern Russian science and education. In the contest of innovative development of perspective inorganic materials with advanced properties, the school is based on the legacy of academician Y.D.Tretyakov in thermodynamics, kinetics and the real structure concept of functional, nano- and biomaterials.

In the talk, several remarkable research directions of academician Y.D.Tretyakov and its scientific school in the frame of materials micro-revolutions will be presented:

- phase diagrams, calorimetry, thermodynamic research and defect chemistry of advanced ferrite systems for the development of magnetic materials, also, a formal kinetic approach for solid state reactions will be discussed as a powerful tool suggested by Y.D.Tretyakov,
- phase diagrams, microstructure, defects and melt processing of rare-earth barium cuprates for manufacturing high-temperature superconducting materials, also, a topochemical memory concept will be discussed in the contest of the real structure of solids,
- phase diagrams, microstructure, whisker crystal growth of various manganites, including those with colossal magnetoresistance,
- biomaterials research for the sake of their medical implementation,
- size and shape effects of silver nanoparticles for the Surface Enhanced Raman Spectroscopy analysis of ecotoxicants and biological objects, nanomaterials for teranostics,
- educational issues for the development of materials science and its chemical aspects in Russian Federation exemplified on the experience of the faculty of materials science of Lomonosov Moscow State University founded and headed by academician Y.D.Tretyakov.