## Transition metal complexes as the basis for new materials: Synthesis, structures and properties

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<u>Abstract:</u> Contemporary technology is based on new materials, which are the results of extensive research in chemical laboratories. Laboratory for Chemistry of Complex Compounds has had a long tradition within the Ruđer Bošković Institute, with roots that go back to the time of foundation of the Institute in the 1950-ties. Over the decades, the activities of the laboratory have been dedicated to research in the field of inorganic chemistry, particularly of complex transition metals compounds, with the aim to understand the stereochemistry of metal species, different ways of coordination of ligands, and the nature of chemical bonding.

In addition to fundamental research, the co-workers of the laboratory have been involved in several technological projects, as *e.g.* in the synthesis of catalysts for oil industries. A significant part of the previous investigations were related to the high-temperature superconducting oxides and a class of compounds containing metal-metal bonds, *i.e.* to the hexanuclear clusters of the group 5 and 6 transition metals. Our recent research has been focused mainly on the design and synthesis of polynuclear complexes of paramagnetic transition metals that may serve as new molecular nanomagnets or display other interesting magnetic properties.

Efforts have been made in the development of new synthetic routes and preparation techniques, determination and correlation of the structural, spectroscopic, electronic and magnetic properties of new complex systems. All the investigations are interdisciplinary and are carried out in collaboration with several laboratories and institutions worldwide.

In this presentation, selected results from each of the main research areas of the laboratory will be illustrated and discussed.