

Classical inorganic materials used in modern electronics present several drawbacks, most importantly high energy consuming production processes and limited possibility of miniaturisation. Therefore there is a growing interest in the development of molecular materials, which are constructed from inorganic and organic fragments bound together into extended structures. Such materials exhibit a wide range of properties which can be combined at the molecular level; for instance magnetic ordering can be united with porosity, sorption ability and structural flexibility, as well as optical transparency or photosensitivity. Moreover, they are usually obtained under mild synthetic conditions and their properties can be easily tuned by the choice of building blocks. Preparation of functional molecular materials in the form of thin films is a crucial step towards their potential applications as memory elements or sensors. Layered structures react more effectively to external stimuli in form of temperature, light or presence of small molecules and they are easier to address in the molecular devices which are the ultimate goal of the fast developing area of molecular electronics and spintronics.

The aim of the project is the construction and characterisation of thin films of solvato-magnetic coordination polymers, which show structural and magnetic changes under sorption of guest molecules. Coordination polymers of this kind excite interest as potential chemo-sensitive magnetic switches. Finding effective ways of preparation of thin films of solvato-magnetic materials will be a step forward towards their practical applications. The project also focuses on the development of reliable characterisation methods, which could be applied to the thin films of structurally flexible materials. The investigation of the influence of magnetic field on the formation of thin films composed of paramagnetic precursors will also be undertaken.