Constructing Covalent Organic-Inorganic Frameworks and Non-Covalent Supramolecular Networks Based on Functionalized Cage-like Silsesquioxanes Towards Novel Class of Porous Materials

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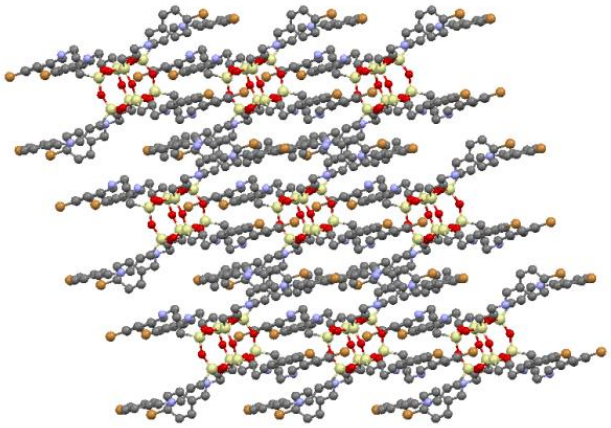
In this project we will develop a **synthetic strategies for a novel class of networks based on properly functionalized polyhedral oligomeric silsesquioxanes (POSS) as molecularly tunable porous (nano)materials creating sophisticated covalent organic-inorganic frameworks and non-covalent supramolecular networks**. Over the past decade, nanoporous materials attracted tremendous attention because of their outstanding performance and broad applications in gas separation, gas storage, catalysis, superhydrophobic interfaces, energy storage and conversion, and optoelectronics.



The **main result** of the project will be the development of novel class of covalent organic-inorganic frameworks and non-covalent supramolecular networks which possess or even directly constitute building blocks for molecularly tunable permanently porous, crystalline materials. **Novelty** of the project is a utilization in constructing of such systems polyhedral oligomeric silsesquioxanes possessing reactive terminal groups responsible for creation of various bonds and interactions. The **main outcome** of the project will be the development of synthetic strategy that yields organic-inorganic materials in the form of large single crystals; this is also considered as a major challenge of the submitted proposal.