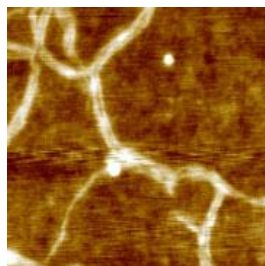


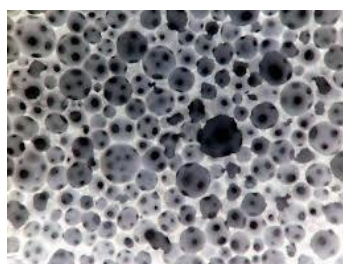
Continuous technological progress causes the miniaturization of all types of electronic devices, which forces scientists to constantly search for new materials and better understanding of the processes taking place at the molecular level. On the other hand, the society expects that the produced devices will be easily available (cheap) and of good quality, what forces works on new, effective technologies for the production of modern components for the production of these devices.

The miniaturization of, for example, computer technologies (according to Moore's law) has caused that we are looking for transistors made of single molecules. Important in this aspect are the so-called molecular wires.



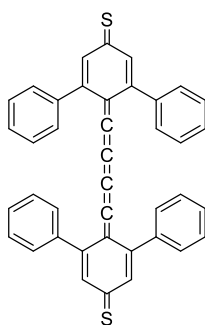
**Figure 1.** Conductive wire made of a single molecule.

In turn, the requirement of cheap production of devices causes a search for new, effective methods of obtaining their components and an original approach to materials in general. In this context, molecular networks capable of retaining other molecules in their structure and releasing them under the influence of a physical impulse (e.g. temperature) have recently been intensively studied. Such porous materials are bound by bonds of varying strength. Porous materials maintained by weak interactions, such as halogen bonding, have recently been investigated.



**Figure 2.** Example of porous material.

The research work planned in this research project is aimed at obtaining the above-described systems, i.e. both molecular wires and porous networks based on a halogen bond. In the latter, metal ions with catalytic properties will often be an additional element. Such materials will be able to act as effective catalysts making it possible to obtain chemical compounds with a specific structure and with good yield (cheap). For the synthesis of both types of materials, very interesting polyynes will be used, in which there is a characteristic system of chemical bonds that allows to expect spectacular physical and chemical properties. As a result of the project, many new systems will be obtained, for which their application potential will be tested. An example of such molecule is shown in the Figure 3 below.



**Figure 3.** Potential molecular wire.