Compounds with an extensive, conjugated system of multiple bonds are found in the area of continuous interest of the scientific world. Such compounds are interesting not only in the context of basic research, or their applications in organic synthesis, but also because of their constantly increasing application potential, e.g. in nanoelectronics. Of the many compounds of this type, the most numerous group are linear polyynes, which are model compounds of, still unknown, carbon allotropes - carbyne.

An interesting group of compounds are unsaturated cyclic compounds, which include relatively well-researched perylenes, annulenes, annulynes or circulynes. In turn, one of the most interesting compounds that structurally resemble those proposed in the research project presented here are the hexamers presented in Figure 1, which - interestingly - were used for the direct synthesis of carbon nanotubes.

During the research, a group of previously unknown macrocyclic phenols and their esters will be obtained. The compounds planned should have a number of interesting physicochemical properties. Liquid crystalline and photophysical properties may be of particular interest and may determine the potential use of these compounds, e.g. in sensor devices or as functional additives for thin film materials.

The obtained macrocycles can be used in coordination and supramolecular chemistry. It is planned to obtain macrocycles of different size of the cavity, which may contribute to obtaining materials capable of separating gases (eg N_2/CO_2). In addition, due to the possibility of modification of the phenolic moiety, the polarity of the system can be influenced. Such materials have applications e.g. as fillings of chromatographic columns.

It should be added that research on the proposed systems, although carried out in many research groups around the world, is rare in Poland, and there are basically no research groups that deal intensively with these types of compounds.

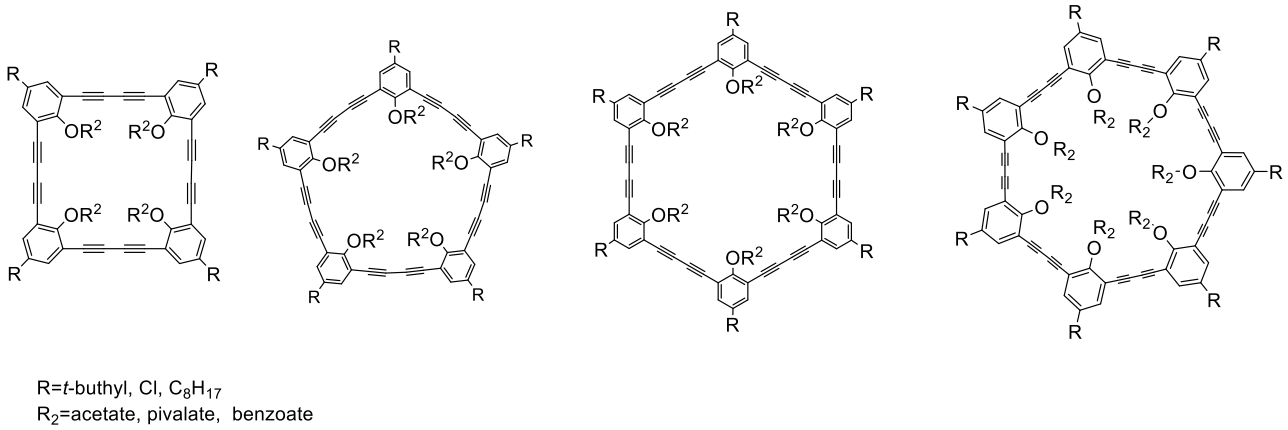

Figure 1. Examples of macrocyclic phenylene butadiynylenes.