

## ABSTRACT

Last decades have brought new applications for organic compounds with sterically expanded systems of  $\pi$ -conjugated bonds as semiconducting materials useful in electronics and optoelectronics. They have been successfully applied and commercialized in electronic elements and devices involving organic light emitting diodes (OLED), organic field-effect transistors (OFET) and organic photovoltaic cells (OPV).

In the present thesis I demonstrate the results of investigations on a new of reaction of synthesis of polycyclic, fused aromatic and heteroaromatic hydrocarbons using aromatic *o,o*-dibrominated dialdehydes as precursors. This new synthetic tool is based on a novel modification of the Friedel-Crafts type intramolecular cyclization reaction involving *O*-protected *ortho*-acetal diarylmethanols as a new type of reactants which enabled synthesis of a series of polycyclic aromatic and heteroaromatic hydrocarbons.

The second part of my PhD thesis constitutes synthesis of nonlinearly fused (hetero)aromatic hydrocarbons of helicene type and it was realized using *o,o*-dibromo dialdehydes as precursors in combination of the Suzuki-Miyaura cross-coupling reaction and the McMurry condensation reaction catalyzed by Pd and Ti.