

Abstract

The $C\equiv C$ bond is an attractive structural motif in the design and modification of new materials. In this dissertation, compounds with this motif were used in the synthesis of macrocyclic compounds. The obtained macrocycles containing butadiyne linkers were characterized by XRD and spectroscopic methods. Three new compounds were obtained, which are pivalate esters of phenols. The presence of large hydroxyl protecting groups affects the architecture of the macrocycle. Strains in macrocyclic systems were determined using calculation methods.

The addition of a halogen atom to the $C\equiv C$ bond leads to a very good halogen bond donor. In the dissertation, this motif was used to design systems with potential porous properties. The halogen interactions in two polymorphs of 1,3,5-tri(iodoethynyl)benzene were investigated and described. The mechanism of formation of various polymorphs was proposed based on computational methods. In addition, the 1-haloalkynyl fragment was used in the modification of tetra-tolylporphyrin. Two isostructural derivatives - bromine and iodine - of the macrocycle were obtained, which were characterized by XRD, NMR and mass spectrometry methods. The formation of channels is observed in the obtained crystals. The volume of the channels is about 20% of the total volume of the cell.