Summary of doctoral thesis: „Symmetrical and unsymmetrical N-alkylphenothiazine derivatives- synthesis and study of their photophysical properties"

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Technological development is causing an intensive search for efficient, possibly low-cost and environmentally friendly solutions. Furthermore, due to the high energy demand and depletion of fossil fuels and other natural resources, great emphasis is placed on the search for efficient methods of obtaining and converting energy from renewable sources. The organic electronics industry, whose devices are based on organic compounds with donor-acceptor (D- A) structures, is part of this trend. The advantage of these systems is the vast possibility of modification for the desired physicochemical properties by selecting appropriate electron donor or acceptor units. The phenothiazine molecule is a frequently used electron-donor motif in D-A systems. Phenothiazine derivatives are extensively studied for their potential application in organic electronics devices due to their optical properties, thermal stability and multiple possibilities for structure functionalization.

The presented doctoral dissertation is devoted to fundamental research in synthesis and selected photophysical properties of symmetric and asymmetric phenothiazine derivatives with donor-acceptor architecture. The synthesis of the target compounds, in addition to the final steps of Sonogashira cross-coupling and Knoevenagel condensation, also involved the preparation of intermediates via alkylation, halogenation and formylation reactions. The structures of the new phenothiazine derivatives were confirmed by ^{1}H NMR, ^{13}C NMR and mass spectrometry or elemental analysis. Their thermal stability was also investigated. The effect of structural changes on selected photophysical properties of the presented compounds based on the phenothiazine skeleton forming the D-A systems was determined.