ABSTRACT

In the Introduction part of this thesis, the chemistry of organofluorine compounds is discussed, particularly the methods for the preparation of organofluorine compounds mainly by fluoroalkylation methods. Furthermore, the chemistry of fluorinated phosphonates, methods of their preparation, reactivity and biological activity is discussed. Additionally, the reactivity of fluoromethane derivatives is briefly mentioned and especially, the reactivity of diethyl fluoromalonate and fluorobisfenylsulfonylmethane is described.

The Results and discussion part is devoted to the reactivity of three fluorinated phosphonates: tetraethyl fluoromethylenbisphosphonate, diethyl fluorophenylsulfonylphosphonate and previously not described diethyl fluoronitromethylphosphonate. These fluorinated phosphonates belong to the family of nucleophilic monofluoroalkylation reagents, meaning that these compounds are convenient starting materials for the synthesis of complex organic molecules containing the fluorine atom. The results deal with the reactivity of above mentioned fluorinated phosphonates, mainly with alkylation reactions, Horner-Wadsworth-Emmons reactions and conjugated additions. Also, other synthetic methods such as the Mitsunobu reaction or the palladium catalyzed allylation reaction were investigated; however, these transformations were not very successful with the above mentioned phosphonates.

In the Experimental section part, detailed experimental procedures including the characterization of newly synthesized compounds are described.