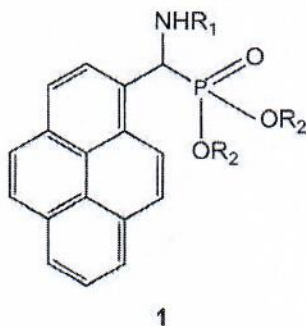


2. Streszczenie w języku angielskim

The subject of this thesis is a continuation of the research conducted at the Department of Organic Chemistry, Faculty of Chemistry, University of Lodz.

It concerns the development and optimization of synthesis routes using the Kabachnik-Fields and aza-Pudovik reactions of α -aminophosphonates containing a pyrene fragment **1**.



Due to the well-known biological activity of α -aminophosphonates, it also seemed interesting to study their cytotoxicity and ecotoxicity. The cytotoxicity of selected compounds was tested against colon cancer cells and human lymphocytes, but the ecotoxicity against crustaceans *Heterocypris incongruens* and luminescent bacteria *Vibrio fischeri*.

Additionally, it could be expected that pyrene aminophosphonates would show fluorescent properties (pyrene is a well-known fluorophore), which could be useful in biological examinations (fluorescent probes). Therefore, measurements of their basic photophysical properties (electronic absorption and emission spectra as well as emission quantum yields) were carried out. Systematic analysis of NMR spectra (^1H , ^{13}C , ^{31}P) and mass spectra of selected compounds was also performed.

Based on the results obtained, it can be concluded that the R_1 and R_2 substituents in the tested compounds have a significant impact on their biological and fluorescent properties, which prompts further research on the synthesis and properties of this group of compounds.