ABSTRACT

This bachelor thesis focuses on incorporating the topic of synthetic macromolecular substances into high school chemistry education. The aim was to analyze the representation of this subject in the framework educational program for high schools, the school educational programmes of selected schools, and available high school chemistry educational texts. Based on the findings, proposals for school experiments and worksheets for laboratory work were developed to familiarize students with the properties, preparation, and applications of these substances.

The theoretical part focuses on the historical context and chemical and physical properties of synthetic polymers, their classification, nomenclature principles, preparation, processing possibilities, and common representatives encountered in everyday life. The practical part includes an analysis of five textbooks, which were compared in terms of the scope and quality of their treatment of this topic. Additionally, the framework educational program for high schools and the school educational programs of five selected high schools from the Hradec Králové region were examined and compared based on their approaches to the topic of synthetic macromolecular substances. The findings indicate that some schools emphasize only the knowledge of applications and examples of there substances, while others highlight the impact of their use on human health and the environment.

Based on the analysis, examples were proposed to connect the topic of synthetic macromolecular substances with various branches of chemistry and other subjects. Furthermore, experiments were developed focusing on the preparation of cross-linked polymers, the degradation of foam polystyrene, and the creation of polyurethane foam.

Furthermore, school experiments were designed focusing on the preparation of cross-linked polymer, foam polystyrene degradation and polyurethane foam creation. The thesis also provides examples of integrating the teaching of synthetic macromolecular substances with various branches of chemistry and other subjects.