

Skin is an important route of drug (API – active pharmaceutical ingredient) administration. Penetration of API into the skin allows to treat dermatological diseases, but some active substances are applied to the skin to be absorbed into the blood stream and to induce a systemic effect (e.g. nitroglycerin) or to achieve local therapeutic effect in the deeper tissues (e.g. in muscles - for antirheumatic effect). Adhesive patches are used as an alternative for ointments, assuring prolonged drug absorption. Many different polymers are used to formulate patch and to serve as a drug carrier. API is incorporated into the matrix and must be released after application at specific rate, which depends on the properties of used polymers and other additives.

Regarding the fact, that diffusion of API molecules through the polymeric matrix is a complex process, resulting from not only physicochemical properties of API, but mostly from structure and other polymeric carrier features, the aim of the current research is to expand and provide additional knowledge on the correlation between nano-, micro- and macro scale structures/physicochemical features of the carrier and the API diffusion process. For the comparative analysis of structure and diffusivity two novel polymers, which are used as adhesive matrices for medicated patches, were chosen: polyacrylates and silicone.

Since the selected polymers differ in chemical character, the research hypothesis states, that conducted experiments will allow to characterise the adhesive matrices with various diffusive properties. It is expected, that obtained results will be useful not only in the process of selection most suitable adhesive matrix material, in regard of API properties and intended release rate, but also they will be helpful further matrix modification with additives or will direct further research for new polymers, that could be used in technology of medicated adhesive patches. The innovative character of the project lays both in a novel experimental methodology and in the fact, that previous studies has been limited to solid polymeric matrices, with insufficient focus on the adhesive layers, which are actually being used as an individual drug carrier more and more often.