

Tytuł projektu
Uzyskanie nowych matryc polimerowych o potencjalnych zastosowaniach w przemyśle kosmetycznym.
Project title
Obtaining new polymer matrices with potential applications in the cosmetics industry.
Dyscyplina /Area of science
Nauki chemiczne/chemical sciences
PROJECT DESCRIPTION
<p>Project goals</p> <ul style="list-style-type: none"> • Development of a method for biopolymer isolation. • Obtaining new polymer matrices based on polymeric blends. <p>Outline</p> <p>Nowadays, the usage of biomaterials is very popular in cosmetics, pharmaceuticals and medical industry due to their biocompatibility and non-toxicity. The biomaterials can be made of natural sources polymers and biodegradable synthetic polymers. Polysaccharides, proteins, polyvinylpyrrolidone and poly(ethylene glycol) are often the initial macromolecular compounds used for matrices production. As it is difficult for individual polymers to meet the requirements for biomaterials with good mechanical and hydrophilic properties, polymers are mixed. The mentioned polymers contain the hydrophilic groups that are able to bind water molecules, which influences gel formation.</p> <p>The obtained polymer films should have good hydrophilic properties, high elasticity, and the ability to transport nutrients. Various active substances, e.g. nutrients, anti-aging and moisturizing substances are to be added to the matrix with appropriate properties.</p> <p>Work plan</p> <ol style="list-style-type: none"> 1. Acquisition of the biopolymers from natural sources. 2. Preparation of polymeric mixtures. 3. Examination of the mechanical properties. 4. Examination of the structure, morphology, physical and chemical properties of the obtained films. 5. Examination of the thermal and photostability. 6. Examination of the active substance release.

Literature

M.-B. Coltelli, et al.; *Cosmetics* 5(4) (2018) 70
L. F. G. Chabala, et al.; *Marine Drugs* 15(10) (2017) 328
G. Sharma, et al.; *Carbohydr Polym* 199 (2018) 534-545
T. S. Anirudhan, et al.; *Int J Biol Macromol* 107(Part A) (2018) 779-789
M. A. López-Mata, et al.; *Iran Polym J* 27(8) (2018) 545-553

Required initial knowledge and skills of the PhD candidate

- ➔ Knowledge about general chemistry, polymer chemistry, biopolymers
- ➔ Knowledge of English language
- ➔ Eager to learn

Zgłaszający projekt/ Author of the project

dr hab. Jolanta Kowalonek

stopień/tytuł, imię, nazwisko

jolak@umk.pl

e-mail

Wydział Chemii UMK

jednostka organizacyjna

Proponowani promotorzy i mentorzy/prospective supervisors

1) promotor główny/ main supervisor

dr hab. Jolanta Kowalonek

e-mail : jolak@umk.pl

Wydział Chemii UMK

jednostka organizacyjna

2) promotor pomocniczy / co-supervisor

-