

**Stability of thermal water and use as the basic raw material for the
production of dermocosmetics.**

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Abstract

Due to the content of many essential minerals necessary for proper body functioning, including skin health, thermal waters have long been of interest to the cosmetics industry, which is constantly seeking innovative solutions to create product lines. These components are particularly useful for sensitive, atopic, and vulnerable skin types that are susceptible to adverse external factors.

In the doctoral thesis, the concept of thermal water was defined, and basic information on the occurrence and division of resources belonging to this segment was presented both worldwide and in Poland. The potential use of thermal waters in the food and cosmetics industries was also discussed.

In the practical part of the thesis, the stability of thermal waters from Poddębice, Mszczonów, Cieplice, and Uniejów was estimated. Based on this assessment, Poddębice was selected for further studies.

After assessing the stability, the characteristics of the selected elements present in Poddębice water were provided. The stability of thermal water was demonstrated after introducing the selected preservatives. Technological tests of specific cosmetic products were performed, quality criteria were evaluated, and tests were carried out on testers. The storage time of water at room temperature, which ensures microbiological cleanliness, was also determined.

The innovative and natural resource - thermal water from the Poddębice well - provides a solution to these problems. Thermal water from the Poddębice well was used as one of the ingredients in cosmetic preparations.

Organoleptic features were evaluated, conservation tests were performed, and the shelf life of these preparations was determined based on aging studies. Products with thermal water increase the level of skin hydration compared to those based on purified technological water. The produced and tested preparations include Cream-gel, Deeply moisturizing cream, Ultra-moisturizing butter, Night cream, and Eye cream. It was demonstrated that cosmetic products produced using thermal water met the expected functional assumptions. All pilot cosmetics were well-rated by testers, and therefore, the decision was made to introduce them into the portfolio of Biogened S.A. company.