Abstract

Today's cosmetic market offers a very wide range of products, both in terms of types of cosmetics and the color palette available. Colours identify the product and also characterise its quality, which is why colour consistency is so important. The motivation for the undertaken research was the lack of tools for measurable and repeatable color assessment, needed in the context of color inconsistencies between production batches and the color instability of products over time.

The basic yet most demanding components in the technological process of makeup cosmetics are pigments. Among them, the most commonly used are titanium dioxide and iron oxides, in their pure or surface modified forms.

In the scientific scope of the presented work, the pigments were characterized using spectroscopic studies (UV-Vis, 1HNMR, FTIR), microscopic studies, transmission electron microscopy (TEM), dynamic light scattering (DLS), differential centrifugal sedimentation (DCS), powder diffraction (PXRD), and X-ray fluorescence spectroscopy (ED-XRF).

Applying ED-XRF method, it turned out that the content of silicon (and consequently of the silane coating) was lower than that declared by the manufacturer for several batches of the purchased raw material.

A stable dispersion system for the red pigment was developed in the technological laboratory, as well as a hybrid method for introducing pigments into the formulation. As a result, the technological process of creating foundations was optimized by reducing the pigment homogenization time.

In the implementation area, the quality control process of finished cosmetic products was improved by introducing a colorimetric measurement technique from the automotive industry.

Keywords:

cosmetic raw materials, cosmetic pigments, analysis of cosmetic pigments, qualitative analysis, colorimetric method, optimization of production processes