Motivation for work

Chemical UV filters are widely used components of sunscreens and other cosmetic and personal care products to protect skin against UV radiation. With regard to adverse health effects of organic UV filters, there are concerns not only about contact allergy but also systemic effects like endocrine disruption. The accurate determination of an organic UV filter contaminant’s physicochemical properties is essential for their realeasment into the environment, and consequently their environmental impact and fate. Physicochemical properties are controlling the valid environmental models and assessments. Conversely, the predictive/interpretive value of environmental studies can be seriously compromised if the physicochemical data upon which they rely are of questionable or unknown quality. The present work focuses on frequently used UV filters (avobenzone, benzophenone-3, octocrylene and octinoxate) and evaluating the resulting thermal behaviour and structural changes. Experimental measurements of density, viscosity and electrical conductivity were performed to get insight into their transport properties in wide temperature range. Differential scanning calorimetry (DSC) and thermogravimetric (TG) analysis were used to determine their melting point and thermal behaviour.

Locality of the sampling from the territory of Vojvodina Province, Republic of Serbia

- The presence of selected UV filters from the cosmetic products in swimming pool water on the territory of the Autonomous Province of Vojvodina was determined by HPLC-DAD method.
- Information regarding experimentally obtained physicochemical properties of UV-filter are still very scarce and is not possible to develop adequate risk assessments.

Density measurements

Materials and methods

- Investigated targeted UV filters
- Octocrylene
- Octynoxate
- Benzophenone-3 (oxybenzone)
- Avobenzone

Conclusions

- Physicochemical properties of UV-filters (density, viscosity, electrical conductivity, thermal stability) are important to understand which analytical methodologies are appropriate to their determination in the different environmental compartments.
- Supported by project: The presence of selected UV filters from the cosmetic products in swimming pool water on the territory of the Autonomous Province of Vojvodina