

PL4. Linear retention index approach applied to liquid chromatography coupled to PDA and QqQ MS detectors for reliable characterization of oxygen heterocyclic compounds in essential oils and finished cosmetic products

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Regulation (EC) n.1223/2009 of the European Parliament includes furocoumarins (FC) in the list of substances prohibited in cosmetic products except for normal content in natural essences used, the limit in sun protection and bronzing products is 1 mg/kg [1]. Despite the official regulations the *Scientific Committee on Consumers Products (SCCP)* and the *International Fragrance Association (IFRA)* are still proposing the maximum content of psoralens in rinse-off and leave-on products, according to the latest evidences of phototoxicity [2,3]. To date, LC coupled to PDA detector is the main technique employed for FC determination. However, the high Limits of Quantification (LOQs) suggested by IFRA, limit the HPLC-PDA application to the analysis of essential oils, making necessary the development of a more sensitive HPLC-MS method for the analysis of FC at trace level in the finished cosmetic products [4]. This work provides a detailed analysis of PDA LOQs calculated for several oxygen heterocyclic compounds, among FC, coumarins, and polymethoxyflavones. The linear retention index approach was used, for the first time, together with the UV library, as an extra criterion for the reliable characterization of the target compounds in the essential oils. The LRI of specific volatile compounds were calculated in order to identify the interfering compounds of the matrix which affect the LOQs. Calibration curves were created in pure solvent and by adding the standard compounds to different blank samples, with the aim to overcome the matrix effect. Moreover, LRI was applied to a new more sensitive HPLC-QqQ MS method, with MS and MS/MS (Multiple Reaction Monitoring) libraries and external calibration. The MS method was validated and used to determine the content of FC in cosmetics, such as perfumes and body wash.

References:

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