

## **New ways to solve an old problem: quantitation of light stabilizers in plastic materials**

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Solar radiation, atmospheric oxygen and thermal stress reduce the lifetime of organic materials in outdoor applications. Therefore different stabilizers such as UV-absorbers, hindered amine light stabilizers (HALS) and phenolic antioxidants are used to prolong the service life. Reliable analytical methods are required for quality control as well as for monitoring the fate of such stabilizers during exposure.

Various chromatographic methods are nowadays available for quantitation of several classes of stabilizers [1]. However, routine analysis of HALS may still be a challenge due to the fact that some commercially available HALS are complex mixtures of up to hundred structurally similar oligomeric compounds that are difficult to analyze with conventional chromatographic methods. The analysis can be optimized in different directions. Separating the different HALS compounds can allow an identification of different stabilizer batches or producers. Degradation reactions and specialized chromatographic methods can be used to quantify the total amount of HALS independently of the exact molecular and oligomeric distribution.

Using the example of the oligomeric HALS Tinuvin 622 different workflows are presented that allow the quantitation, characterization and degradation monitoring of oligomeric HALS in real samples.

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[1] M.S. Dopico-Garcia, R. Noguero-Cal, M. M. Castro-Lopez, M.C. Cela-Perez, E. Pinon-Giz, J.M. Lopez-Vilarino, M.V. Gonzalez-Rodriguez, Cent. Eur. J. Chem. 10 (2012) 585.