

[Degradation of wood by UV light: A study by EGA-MS and Py-GC/MS with on line irradiation system](#)

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Abstract:

UV degradation of wood is an important phenomenon that entails loss of aesthetic and mechanic properties. The changes are usually studied with artificial ageing followed by spectroscopy, and focus on colour changes. Analytical pyrolysis coupled with gas chromatography-mass spectrometry (Py-GC/MS) and evolved gas analysis-mass spectrometry (EGA-MS) are powerful tools for wood characterisation, but the change in pyrolytic behaviour of wood after UV irradiation is not well documented. In this work, a new instrumental setup was used to perform UV irradiation on line with EGA-MS and Py-GC/MS with in situ derivatisation of fir and chestnut wood. The effect of UV exposure was evaluated in terms of thermal stability and composition of the pyrolysate. The results showed that UV degradation of the samples was mainly related to the lignin fraction, and significant differences were observed between the two species. Fir wood, showed extensive degradation after 4 hours of irradiation, while chestnut wood, showed very small changes. Qualitative comparison of the EGA-MS profiles and semi-quantitative analyses of the composition of the pyrolysates revealed that these techniques could be used as a fast monitoring tool to assess the UV degradation of wood.

* Excerpted from online journal website (Click the title)

Frontier Labs Products used:

Multi-Shot Pyrolyzer EGA/Py-3030D, Micro-UV Irradiator UV-1047Xe, UADTM-2.5 N