

# **Comparative Study of XIX Century Woods from the Historical Collection of Physics Instruments at the University of Palermo by Thermogravimetry coupled with FTIR Spectroscopy**

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## **Abstract**

Thermal and structural properties of historical woods from apparatuses of the Historical Collection of the Physics Instruments of the University of Palermo have been investigated by FTIR spectroscopy coupled with thermogravimetric (TG) analysis. Specifically, the wooden portions of acoustics apparatuses from XIX century have been studied. The thermal behaviour of the wooden materials has been successfully interpreted on the basis of specific indexes determined by the quantitative analysis of the FTIR spectra. The kinetics of the wood pyrolysis have been investigated by using a non-isothermal approach. Interestingly, the activation energy of the pyrolysis process reflects both the peculiar composition (related to the specific wooden taxon) and the conservation state of the historical woods. The thermogravimetric parameters have been correlated to the lignin index of the woods by proper experimental equations, which can be considered as a novel protocol to estimate the preservation conditions of historical woods from different taxon.