

Amber resins provenance and datation by non invasive FTIR and chemometric analysis

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In this study, 28 fossil resins of amber samples from various localities in Europe, Asia and America. Infrared spectroscopy was used to identify the molecular features that characterize these ambers. Through the development of a tailored chemometric approach, we reduced the impact of non-significant spectral contributions and highlighted the most relevant features for classifying amber samples. This was achieved by applying second-derivative processing to the spectra and segmenting them into specific wavenumber ranges. Our novel approach successfully groups ambers based on both age and geographical provenance using their FTIR spectral profiles. Additionally, it isolates the molecular vibrations that have the greatest influence on this classification, particularly the contributions from functional groups that differentiate these samples. This method offers a valuable tool for researchers engaged in amber provenance studies, especially for succinites originated from Eastern Europe, providing a new approach to identify and classify unknown resin samples based on their unique molecular signatures.

Słowa kluczowe

Amber fossil resins, Geological age of amber, Provenance of amber, Chemometrics, FT-IR

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