



Diamond cell Fourier transform infrared spectroscopy transmittance analysis of black toners on questioned documents

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ABSTRACT

This paper describes the use of a diamond cell Fourier transform infrared (FTIR) spectroscopy methodology for the analysis of black toners commercialised in Portugal. A total of one hundred and thirty-eight samples from eighteen manufacturers were analysed in transmittance mode through a diamond cell. This methodology was considered to be non-destructive as it allows the forensic analysis of the questioned documents while preserving their integrity. The questioned documents' substrate (paper sheets) has no influence on the final result. This technique shows high repeatability and intermediate precision. Spectra were organized in twenty distinct groups based on their main chemical characteristics and relative peak intensity; and a black toner infrared spectral library was developed. Spectral matches between forty-five blind samples and the database resulted in a 100% positive identification to the correct group.

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