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COMPARISON OF THE MAIN DATING METHODS FOR SIX BALL-POINT PEN INKS

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Abstract

Determining the approximate date that an ink was deposited on a document is an increasingly pressing judicial need. Standardised analytical methods are required for this that allow inks to be dated. Existing methods require a comparison and validation for different kinds of ink. This validation and comparison must be done using real samples of known age and in conditions of controlled storage.

This paper will present the main existing dating methods that are being used in forensic laboratories, and they will be applied to six different blue and black inks for the Innoxrom[®], Montblanc[®] and Sigma[®] brands for ink samples deposited in a period of 0 to 2 years, stored in controlled conditions and analysed every month. These methods are based on determining solvents and dyes using gas-chromatography mass spectrometry (GC-MS) and high-pressure liquid chromatography with diode array detection (HPLC-DAD) respectively. Dating methods can be simple or combined, using either a single parameter or multiple parameters, enabling concentration ratios to be determined irrespective of the amount of the sample. The combined methods that determine both solvents and dyes are the ones that present the most reproducible results over longer periods after the ink has been deposited.

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