

# Advances in gas chromatography-mass spectrometry applied to forensic sciences

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Gas chromatography coupled to mass spectrometry (GC-MS) is the gold standard in the forensic area, however, it presents analytical limitations for thermolabile, reactive, and high-boiling compounds. In this context, lowering the inlet temperature and/or shortening the chromatographic column can minimize some analytical limitations. Short column GC-MS analysis also shows other advantages, as a higher analytical detectability, shorter analysis time and lower elution temperatures. In this paper, some applications of short column GC-MS to solve or minimize analytical limitations in the forensic context are presented. The first application is the analysis of compounds from the 25R-NBOH family, which is a group of thermally labile compounds traditionally analyzed by GC-MS after derivatization — a step that is time consuming in a routine work. The second application is the analysis of cocaine cutting agents, including plastic antioxidants (PAO) BHT, FOS, and NOX, in cocaine products (65 cocaine salt samples, 38 cocaine base samples, and 20 samples with no detected cocaine). PAO are high-boiling compounds. Mass fragmentation pattern of 25R-NBOH and PAOs, not previously reported are also presented.