

GC/MS Analysis of Organic Explosives: In-Injection Port Thermal Desorption.

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A thermal desorption method has been developed for the analysis of organic explosives collected on vapor sorbent tubes (Tenax TA and sol-gel derived) and Teflon dry surface wipes. The analytical method utilizes a standard split/splitless injection port as a thermal desorption unit and requires minimal instrument modification. The "in-injection port" thermal desorption method can be readily utilized by any forensic laboratory equipped with a GC possessing an appropriate detector for explosives analysis. The in-injection port thermal desorption method has been coupled with negative ion chemical ionization (NICI) GC/MS for the analysis of a suite of 13 explosives and explosives-related organic compounds. Method limits of detection have been determined and the methodology has been tested in the laboratory and under limited field conditions. Limits of detection for the thermal desorption method are higher than those determined by splitless liquid injection. The Teflon surface wipe has been tested on debris from a TNT-based explosive device. Field use of the sorbent tube methodology has included wide-area monitoring for explosives using honeybees as an environmental sampling tool. The sorbent tube method has also proven useful in determining rates of explosive vaporization in laboratory chamber tests.