

Simple, Quantitative Headspace Characterization by Cryoadsorption on a Short Alumina PLOT Column

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The use of purge and trap methods for sampling volatile organic compounds prior to chromatographic analysis is a mature technology. Application to low volatility compounds has been far less facile and sensitive, however. Especially problematic has been applications that require precise quantitative analysis and also analyses performed as a function of sample temperature. In this respect, we require more than a simple chemical analysis but a combination of analysis and thermodynamic measurement. In recent work, we have applied short lengths of alumina coated PLOT columns as purge traps, and operate the traps at low temperature during the collection cycles to improve efficiency, in a method called cryoadsorption. We have applied the method as a function of temperature to a medium volatility solid, coumarin, as a demonstration, with further application to the pure explosive compound 2,4,6-trinitrotoluene, TNT, and the practical explosive C-4. The uncertainty and potential sensitivity is discussed as well. This talk will focus on providing a description of the technique, and a discussion of the scope of application.