Real-time science solutions

XZ Transmission Module

The XZ Transmission Module is a new sampling stage designed to permit rapid screening and quantitation of components present in food products, dietary supplements, and samples isolated from these materials using popular solid phase extraction technologies. The module is designed to sequentially present a series of samples for analysis with IonSense open air desorption direct analysis in real time (DART®) ionization source interfaced to either LC/MS or LC/MS/MS instruments.

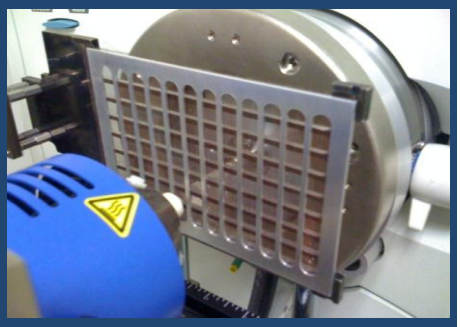
Unlike conventional DART-MS, the module enables so called "Transmission DART", an experiment where the heated ionizing gas exits the source and flows through a metal screen onto which samples have been deposited. Use of screen increases the surface area available for sample deposition thus increasing sensitivity. The metal screen also enables more uniform thermal desorption of larger sample spots providing more accurate quantitative analyses than previously demonstrated with non-permeable sample holders.

Sample preparation involves simple deposition of 1 – 5 ul aliquots of liquid directly onto the metal screen surface in the same pattern as a 96-well microtiter plate. Samples can be manually pipetted or deposited on the screen by using laboratory robotics. The screen density is sufficient that liquid does not pass through but instead accumulate on the surface which is ideal for desorption ionization experiments.

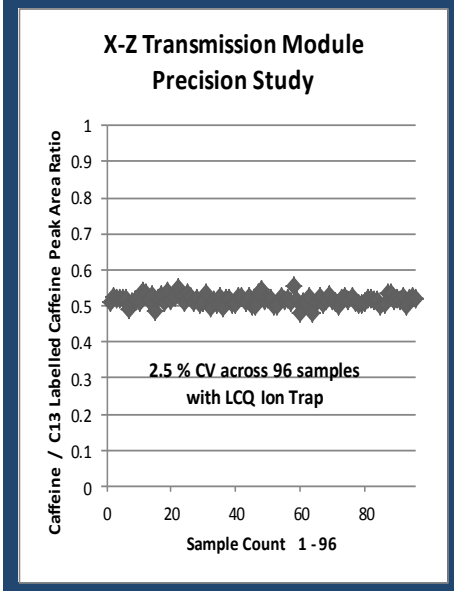
Any DART-SVP can be equipped with a 3+D Scanner to enable the XZ Transmission Module. Digital control of the scanner enables sequential presentation of one sample after another into the surface desorption ionization region while providing the user with flexibility to set the DART gas temperature and length of desorption time depending on the type of sample being analyzed.

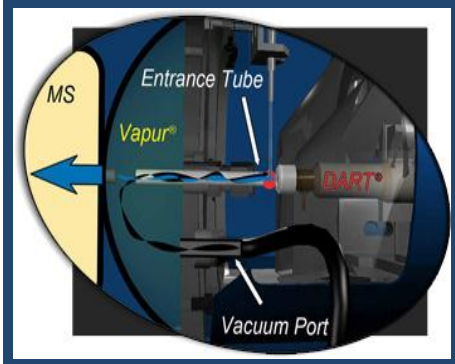
Using the 3+D Scanner a series of 96-sample can be analyzed in under 16 minutes. The Precision Study figure shows the results of repetitive analysis of a caffeine sample which has been spiked with a C^{13} labeled standard. Analysis of the 96 samples was completed using an LCQ scanning a 5 mass unit window containing both protonated sample and labeled standard. The mass spectra were acquired into a single file for processing. The repetitive analysis results in generation of a series of peaks yielding mass chromatograms with peak widths of 5 to 8 seconds. These peak areas can be integrated using the peak detection algorithms provided by the instrument manufacturers. The standard deviation for the measurement was under 3 percent.

For routine operation it's simply a matter of inserting the screen, selecting the XZ method on the iPod touch interface, editing a few parameters and starting the method to begin data acquisition with your DART-SVP equipped LC/MS. For a video of the 3+D Scanner in action visit **http://www.ionsense.com/x-z_transmission**



3+D Scanner with XZ Transmission Module





Schematic of the VAPUR® interface which transfers ion from the XZ Transmission Module to the API of the LC/MS

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