

Characterization of a Multi-Port Inlet on a Rugged Mass Spectrometer

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Laboratory analyses often afford the scientist a vast array of analytical techniques and capabilities. Field operators rarely have this luxury; as they are often forced to employ highly specific analyses or rely on more portable, non-selective techniques. These restrictions result in limited information or less definitive data, viz. high false alarm rates. Mass spectrometry could potentially alleviate these issues, as it is extremely valuable in the laboratory setting but can be limited in the field for a variety of reasons including limited sample introduction techniques, complexity, cost, and durability.

The Griffin 450 GCMS addresses these limitations of mass spectrometry as it offers a wide range of sample introduction techniques in a rugged and transportable package. For rapid separation, the system utilizes a low thermal mass gas chromatograph. A cylindrical ion trap mass analyzer provides multi-dimensional mass analysis; and intuitive software allows the user to obtain high quality analyses without significant user input.

The reach of the instrument is extended by using a detachable, lightweight sample collection device, the Griffin X-Sorber, to collect samples remotely for transfer back to the Griffin 450. The X-Sorber includes two solid sorbent tubes for sample collection. During collection additional information is logged, including GPS location, identification of the user, sample tube identification number, volume of sample, and time of sampling. The sampling flow rate is controlled and sample collection can be automatically started and stopped at predefined times. When the X-Sorber is returned to the instrument, all of the information is transferred and logged with the collected data. Two sorbent tubes are included in the sampler and can be sampled independently or together allowing for multiple collection areas or the collection of archivable samples, respectively.

Representative data including EPA methods 8260 and 8270, pesticide analysis, toxic industrial chemicals, explosives, and chemical warfare agent simulants will be presented. A detailed technical description of the hardware and software will also be provided.