ENTECH INSTRUMENTS

See What's Really There™

2022
CATALOG

Solutions for Chemical Monitoring & Analysis

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President's Letter

Entech Instruments is continuing its tradition of providing the most advanced and accurate sample preparations systems available for headspace and gas sample analysis by GC and GCMS. Our new Multi-Capillary Column Trapping Systems (MCCTS) are transforming the way that gas phase sample preconcentration is performed prior to GC injection, all without the use of liquid nitrogen or even electronic cooling systems.   These "fan cooled", extremely robust and reliable multi-stage capillary column traps manage water and CO2 hundreds of times better than any packed trap system. This means much faster release for better chromatography, supporting "faster" GC methods, while also demonstrating far better immunity to contamination when exposed to high concentration samples. Our MCCTS traps have been implemented in a full cryogen free TO15 solution with much faster GC injections and shorter run times than other TO15 systems on the market. Other applications using this revolutionary capillary trapping technology will also soon be announced.

Entech's patent pending Sorbent Pen™ technology takes SPME to the next level by providing enhanced sensitivity, improved quantitation, and greater robustness than its fiber-based predecessor. Sorbent Pens utilize a unique flow through cartridge that forms a seal on a vial allowing a vacuum to be created within the vial. This new technique called VASE (Vacuum Assisted Sorbent Extraction) has been demonstrated to cover the entire range of analytes from the lightest volatile compounds (Freon 12/Vinyl Chloride and others) to very heavy 5-6 ring PAH compounds, while remaining in the headspace to avoid actual contact with the sample matrix. With 50-150x higher phase loading and the use of traditional adsorbents with thousands of times more surface area than SPME, the Sorbent Pen™ can fully extract difficult compounds from complex matrices providing superior sensitivity and reproducibility. Sorbent Pens are also available for performing Diffusive and Active air monitoring, making the Sorbent Pen technique extremely versatile. Our newly released SPR40 -Sample Preparation Rail promises to be a game changer for headspace sample preparation and general thermal desorption methods. Rather than desorbing a TD tube into a completely different instrument with separate traps, transfer lines, and rotary valves to have to clean and maintain, the SPR40 allows thermal desorption of Sorbent Pens directly into a GC or GCMS to allow dramatically improved recovery, consistency, and easy of maintenance. Watch for a new wave of applications coming out in 2019-2020 using the SPR40 Robotic inlet.

Our unmatched Silonite™ surface coatings continue to be perfected, resulting in the most consistent, durable, and inert coatings available for GC inlet systems and for mercury vapor handling without surface interactions. Silonite™ surface treatments play a vital role in achieving our ultimate goal; to provide our customers with complete solutions for "analytical grade" VOC and SVOC handling and inlet systems that can sample, store, and recover virtually all GCMS compatible compounds.

Finally, for US EPA Method TO-15 and China HJ-759, Entech is proud to be the only supplier that manufacturers and supports the complete solution for sampling and analysis of airborne contaminants using Silonite™ coated stainless steel canisters. Entech has assembled an extraordinary and talented team of Chemists and Service Engineers with a combined knowledge of over 200 years of laboratory and field experience – to provide our clients with premier customer service and on-site support. To our valued customers we would like to say thank you for your patronage through the years and we look forward to servicing your analytical needs for many years to come.

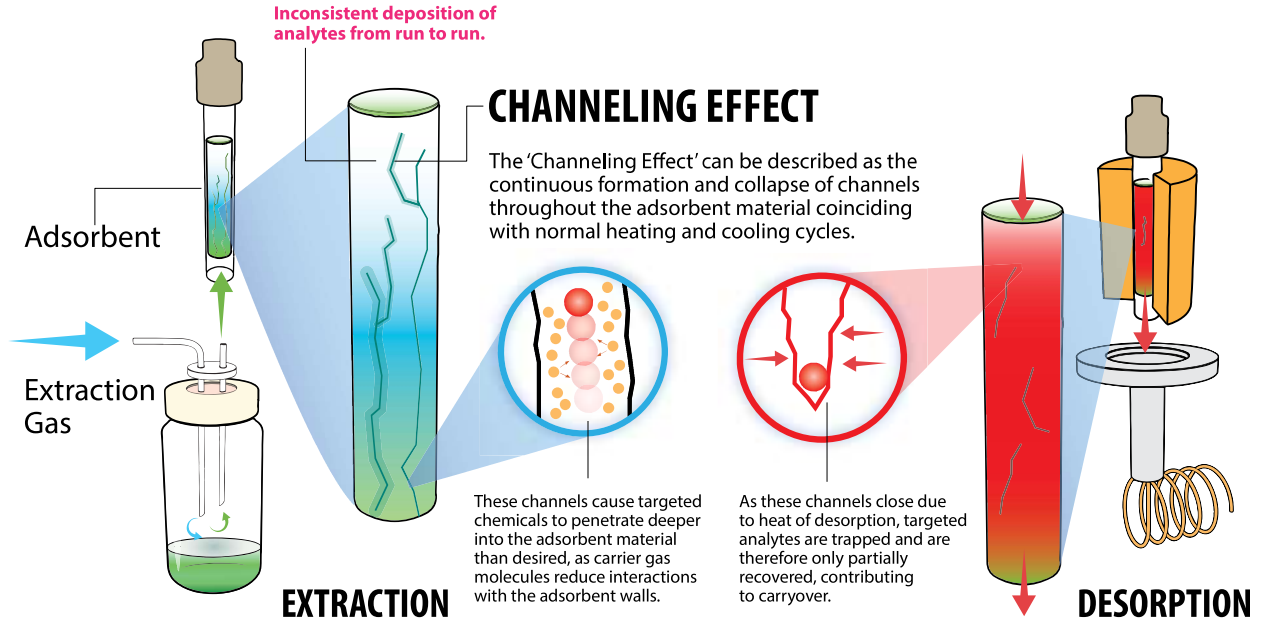Sincerely,
Daniel B. Cardin – President

Entech Instruments is a leading developer and manufacturer of analytical instrumentation that supports professionals around the world in the Environmental, Industrial Hygiene, Food & Beverage, Product Testing, Forensics, and Clinical Analysis markets.

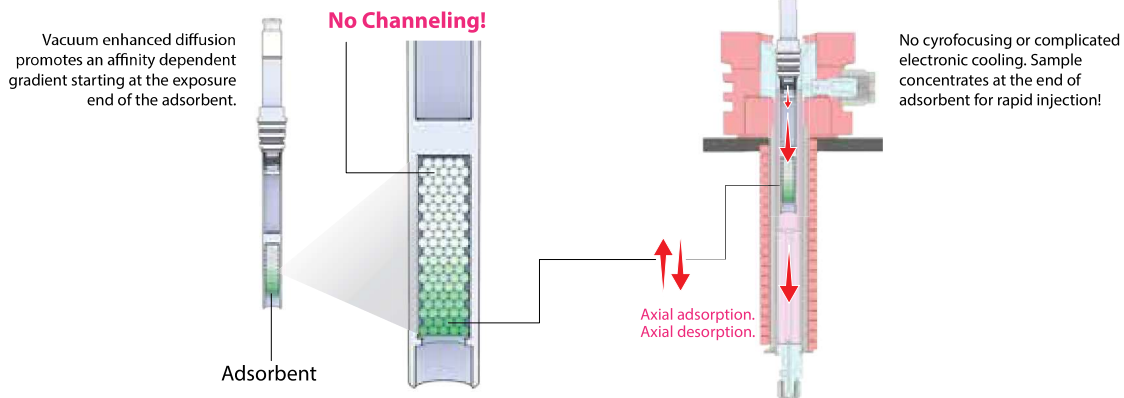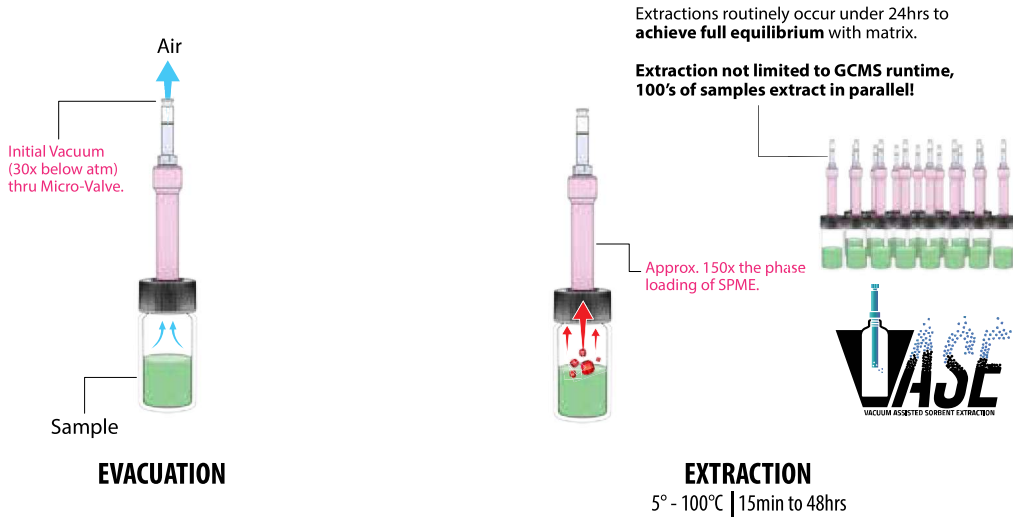To provide solutions for such a diverse set of industry applications, Entech has assembled an extraordinary and talented team – a combined knowledge of over 200 years of laboratory and field experience – to provide our clients with premier customer service and on-site support. We invite you to share your application challenges and requirements so we can create a customized solution just for you.

~ The Entech Team

# Channeling: Limitations of technologies using flow-through adsorbent beds

Inconsistent deposition of analytes from run to run.

Adsorbent

Extraction Gas

CHANNELING EFFECT

The 'Channeling Effect' can be described as the continuous formation and collapse of channels throughout the adsorbent material coinciding with normal heating and cooling cycles.

These channels cause targeted chemicals to penetrate deeper into the adsorbent material than desired, as carrier gas molecules reduce interactions with the adsorbent walls.

As these channels close due to heat of desorption, targeted analytes are trapped and are therefore only partially recovered, contributing to carryover.

EXTRACTION

DESORPTION

VASE Provides Extraction Efficiencies & Promotes Reproducible Analyte Deposition Gradients.

Air

Initial Vacuum (30x below atm) thru Micro-Valve.

Sample

EVACUATION

Extractions routinely occur under 24hrs to **achieve full equilibrium** with matrix.

Extraction not limited to GCMS runtime, 100's of samples extract in parallel!

Approx. 150x the phase loading of SPME.

EXTRACTION
5° - 100℃ | 15min to 48hrs

Vacuum enhanced diffusion promotes an affinity dependent gradient starting at the exposure end of the adsorbent.

No Channeling!

Adsorbent

Axial adsorption. Axial desorption.

No cyrofocusing or complicated electronic cooling. Sample concentrates at the end of adsorbent for rapid injection!

5800 Sorbent Pen™ Desorption Unit (SPDU)

The 5800 SPDU is a thermal desorption system designed to reliably deliver samples collected on Sorbent Pens™ to a GC or GCMS. The unique design of the 5800 SPDU (multiple patents pending) includes a far shorter path length to the GC column than any other thermal tube desorption system (only 1-2cm), while supporting a dual GC column interface that allows additional sample preparation "inside the GC oven", where losses due to cold spots and exposure to active surfaces are far less likely. Most other thermal desorption systems desorb samples far away from the GC, requiring rotary valves, long transfer lines, and often additional trapping to finally deliver the sample to the GC column. Long sample path lengths generally equate to reduced recoveries, both due to the addition of reactive transfer line surfaces, and the eventual deposition of very low vapor pressure compounds that will likely affect the reliable transport of target compounds to the GC. The 5800 eliminates these concerns by desorbing samples directly into the GC, allowing consistent analytical results with minimal maintenance. The 5800 supports 3 injection modes, including SPLIT, SPLITLESS SVOC, and SPLITLESS VOC, all without any cryogenic or electronic cooling, so moisture can be managed while achieving optimum sensitivity and chromatographic resolution. All 4 types of Sorbent Pens are supported (HSP, FSP, DSP, & ASP), while maintaining a vertical position of the Sorbent Pens through the entire heating and cooling cycle to prevent the formation of gaps along the walls of the tube which often occurs with horizontally positioned desorbers, which in turn increases the potential for channeling during dynamic headspace sampling. The 5800 supports 2 split ports that are used for split injection, bakeout, backflushing, and focusing operations. The 5800 SPDU can be used without automation by introducing Sorbent Pens to the 5800 one at a time, or the SPR40 Sample Prep Rail can automate the analysis of up to 240 Sorbent Pens unattended.
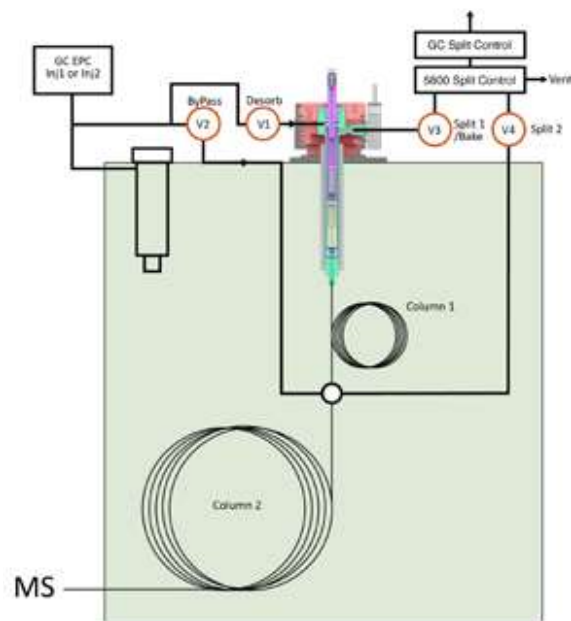
5800 SPDU - Easily transfers volatile and semi-volatile compounds to a GCMS for extremely sensitive and accurate Sorbent Pen analysis.

- **Direct thermal desorption of Sorbent Pens into all 3 major GC brands**

- **Avoids transfer lines and rotary valves, maximizing recovery and long term system stability**

- **Performs injections using SPLIT (VOC thru SVOC), SPLITLESS VOC, or SPLITLESS SVOC Modes for maximum flexibility, dynamic range, and sensitivity**

- **Backflushes to remove heavy, unwanted compounds to reduce both run times and thermal stress on GC columns**

- **Desorbs the sample within 1-2cm of the GC column, through an inert, easily replaceable glass liner**

- **Supports "Delayed Split Injections" to allow carrier gas pressures to equilibrate to improve split injection consistencies**

- **Maintains sorbent devices (Pens) in the vertical position to avoid "wall-gaps" when sorbents are cooled in a horizontal tube**

- **Entech SPRINT control software orchestrates either manual or multi-sample automated analysis**

- **Takes thermal desorption technology to the next level of consistency and performance**