



Reproducibility of the 7400 Autosampler for BTEX in Water

Application Note Environment

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The CDS Purge & Trap Autosampling system includes a Model 7000 Purge & Trap with a Model 7400 Autosampler capable of analyzing water and soil samples. In the soil mode, water and internal standard are added to the sample vessel which is then stirred and purged in a temperature controlled zone to the trap of the 7000. In the water mode, samples are transferred to the purging vessel of the 7000, an internal standard solution added, and the sample is then purged to the trap of the 7000. After analysis, the water is drained, the vessel rinsed and automatic blank runs may be added before analysis of the next sample.

Figure 1 shows a simple analysis of BTEX compounds at the 50 PPB level in water. Five ml samples of water were transferred from the autosampler vials to the 7000 and then purged at 35ml/min with helium for 11 minutes. To evaluate reproducibility, multiple samples of the same concentration were analyzed in the same way, rinsing the vial and baking the trap between runs, but without blank runs between the samples.

Figure 2 shows the peaks for benzene and the internal standard overlaid for several consecutive runs. Peak area ratios were calculated for each of the analytes using the internal standard. For a total of eight analyses, the RSD for benzene was 1.2%, for toluene, 2.1%, for ethylbenzene, 2.6%, and for xylene,

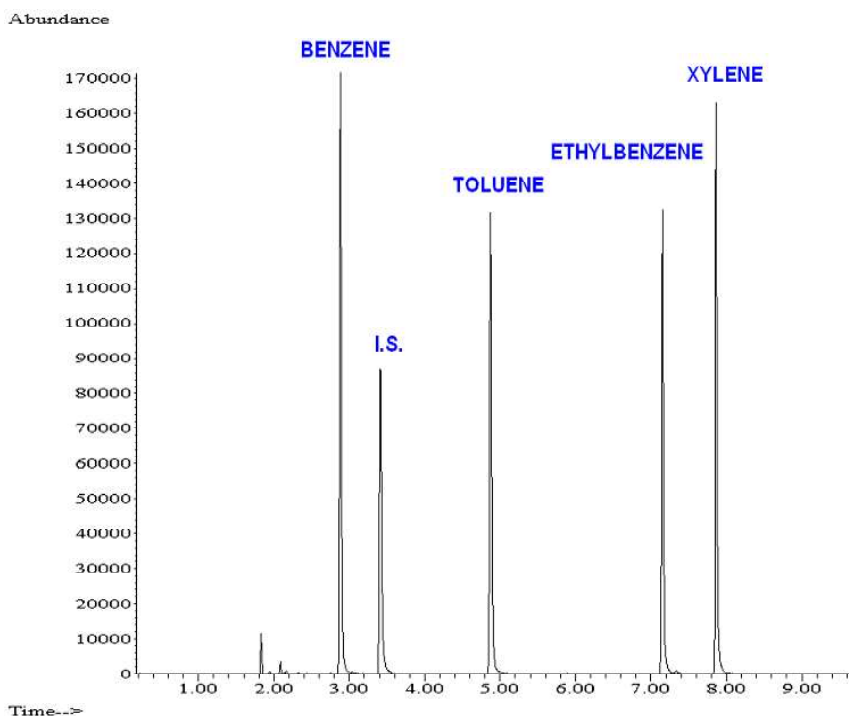


Figure 1. BTEX in water, 50 PPB each.

Instrument Conditions

CDS Model 7400 Autosampler Purge and Trap

Valve oven: 130°C
Transfer line: 130°C
Purge time: 11 minutes
Purge flow: 35 ml/min
Trap dry: 35°C for 1 minute
Desorb preheat: 245°C for 0.6 minutes
Trap desorb: 250°C for 2 minutes
Trap bake: 260°C for 10 minutes

GC/MS

Column: 5% phenyl (30m x 0.25mm x 0.25µm)
Carrier: Helium, 20:1 split
Injector: 300°C
Oven: 40°C for 4 minutes
10°C/min to 210°C for 1 minute

Mass Range: 35 to 550amu
Source Temp: 230°C

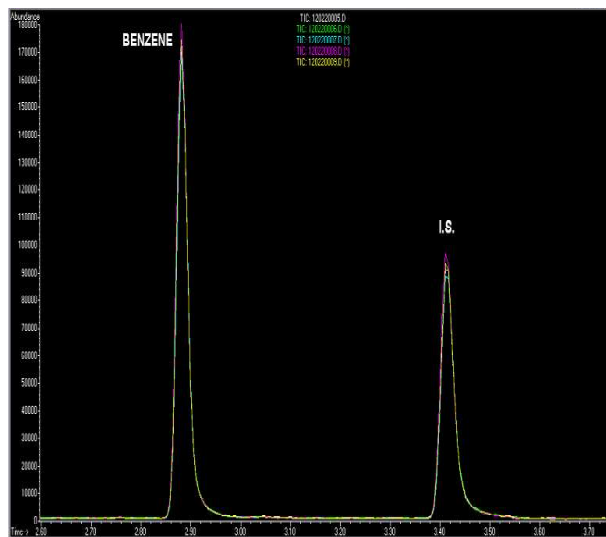


Figure 2. Five runs of benzene and the internal standard, overlaid.

FOR MORE INFORMATION CONCERNING THIS APPLICATION,
WE RECOMMEND THE FOLLOWING READING:

T. A. Bellar and J. J. Lichtenberg,
J.Am. Waterworks Assn., 66 (12) 739.