*e*GC
environmental Gas Chromatograph
Cannister Comparison TO-15

The eGC is a very precise autonomous field gas chromatograph that is capable of accurate sub-ppbv measurements in complex chemical environments. eGC measurements have been shown to correlate closely with results obtained by EPA lab reference methods.

INTRODUCTION

When analyzing ambient air samples for VOCs at sub ppb levels, with a field instrument directly exposed to the heat of summer and cold of winter, accurate and precise measurements require two things; control of the thermal environment of the measurement instrument and regular calibration with a stable gas standard of known concentration. The eGC is designed to generate highly precise measurements by actively controlling the instrument temperature and by frequent, automatic re-calibration of the instrument.

Often, field instrument data are compared to data obtained from EPA approved sampling methods such as cannister or passive absorption tube collection. A critical advantage of field instruments is their ability to provide near real-time analysis information, thereby allowing a better understanding of the temporal variation of vapor concentrations, something not easily achieved by canister or sampling tubes. For any field deployed instrument

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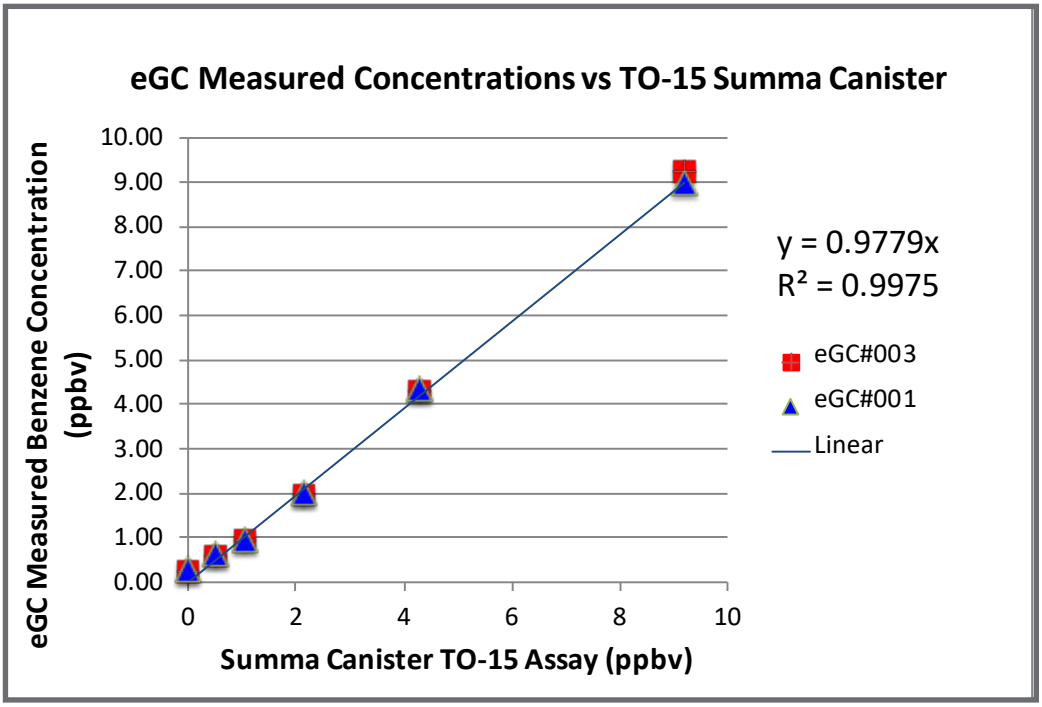
its measurement accuracy is directly related to the accuracy of the reference standard used for calibration. Typically, field instruments are calibrated from certified standards provided in compressed gas cylinders. These standards must be traceable to an accepted analysis method and most importantly, stable over time if the results are to be of use for comparison to different analytical methods.

This report presents information on how two eGC's calibrated over the range of 0-200ppbv, measuring benzene using a traceable reference compressed gas cylinder. The primary reference cylinder was diluted with zero air to generate five concentration values. This was done over the range of (0.0 to 10.9ppbv benzene).

EXPERIMENTAL PROCESS

A cleaned contamination free, Tedlar sampling bag was used to capture benzene vapor samples delivered from a mass flow controlled gas dilution system. The sample bag was analyzed by the eGC in triplicate and then 12 liters were collected by two summa canisters (6 liters each) for laboratory TO-15 analysis.

The plot compares the EPA TO-15 Method measurement result to the eGC measurements of the same gas sample. This graph illustrates that the eGC correlates well with laboratory results over the designated analysis range.



Graphic of an eGC correlation to Summa Canister

CONCLUSION

The eGC is a highly precise instrument; however, its accuracy is dependent on the calibration cylinder assay. When using the eGC, it is important to be sure of the assay of the reference standard. Comparing the calibration cylinder assay to an ambinet air reference methods using a canister is highly recommended to determine possible differences. Re-analyzing the field standard periodically over time allows changes that occur to be known and ensures the best possible eGC accuracy.

Contact ENMET's application team for additional information.

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