**INTRODUCTION**

The Stockholm Convention (2004) is an international treaty that aims to eliminate or restrict the production and use of certain persistent organic pollutants (POPs). The Stockholm Convention, in particular, lists 20 persistent organic pollutants (POPs) (including PCBs, DDT, its degradation products, and HCB) that are likely to bio-accumulate, tend to biomagnify, and are highly toxic to humans. Since POPs are chemicals that persist in the environment and can travel long distances, they pose a threat to human health and the environment across the globe. The Stockholm Convention (2004) is an international treaty that aims to eliminate or restrict the production and use of certain persistent organic pollutants (POPs).

**APGC OVERVIEW**

Atmospheric pressure GC (APGC), first developed in the 1970s, has been used in a mixed mode using both charge transfer and (II) Protonation.

**MECHANISMS OF IONIZATION**

There are two primary mechanisms of ionization that APGC can undergo (Figure 3):

1. **Charge transfer** initiated by corona discharge ionization of the sample in the source to generate radical cations. This method provides excellent sensitivity and selectivity for the analysis of POPs. A critical aspect of the analysis of PCBs is the chromatographic separation of PCB isomers to provide correct identification and accurate quantification. Without chromatographic separation, resolution of PCB isomers may lead to incorrect identifications and inaccurate quantifications. A critical aspect of the analysis of PCBs is the chromatographic separation of PCB isomers to provide correct identification and accurate quantification. Without chromatographic separation, resolution of PCB isomers may lead to incorrect identifications and inaccurate quantifications.

2. **Protonation** where the proton source can be water, methanol, or other proton sources. This form of ionization is favoured for low-polarity compounds.

**RESULTS**

Under **“in-sky” source conditions**, PCBs and PCDDs undergo protonation during a charge transfer mechanism (Figure 5). Protonation in APGC is generally considered to be less energetically effective than in ESI-MS/MS, and the THF solution of the PCDD standard was performed using nonvolatile and the THF solution of the PCDF standard was injected standards in shown in Table 1.

**SENSITIVITY**

High levels of molecular ions of PCDDs and PCDFs lead to impressive sensitivity for these trace level contaminants. High sensitivity, very similar to that observed for ESI-MS/MS, is found in APGC experiments, and is therefore ideal for trace level detection. Figure 6 shows extracted ion chromatograms for native TCDD in calibration standard CS1 (1 ng). The data show that TCDD is <10 ng for the 17 analytes that cover an ion signal range of 10 fg - 1 pg in standards.

**CONCLUSION**

The data above describe encouraging results for the analysis of PCBs and PCDDs, however, more research is needed to further improve the sensitivity and selectivity of the APGC-MS/MS approach. Future research should focus on improving the chromatographic separation of PCB isomers and developing more robust and sensitive methods for the analysis of POPs.