Gas Chromatography / Mass Spectrometry Systems

The school has five GC/MS systems including one with negative and positive chemical ionisation facilities interfaced with a thermal desorption system to facilitate VOC determination.

HRGC 8000 Series Gas Chromatograph (Fisons Instruments)

The HRGC 8000 Series GC has a chiral column and this instrument can be used for both packed and capillary gas chromatography analyses.

This instrument is interfaced with a Thermal Desorption system which allows you to desorb VOC samples and immediately analyse them on column.

Fisons' MD-800 Gas Chromatograph/Mass Spectrometer (GC/MS) Instrument

The divisions Fisons' MD-800 GC-MS instrument can determine persistent organic pollutants like polychlorinated biphenyls (PCBs), and polybrominated diphenyl ethers (PBDEs) from samples including air, dust, food, sediment, soil, and water.

Samples must be prepared using one of the solvent extraction instruments and open column chromatography to remove any interferences.

Typical on-column detection limits are 1-10 pg per compound, which for example enables the detection of these contaminants at the sub-pg m-3 level in air.

Fisons' MD-800 and a Thermo Trio benchtop GC/MS system

We possess another Fisons' MD-800 and a Thermo Trio benchtop GC/MS system. The sensitivity of these is lower (typically 100 pg "on-column") but they are capable of the determination of pollutants such as polycyclic aromatic hydrocarbons (PAH), and aliphatic hydrocarbons.

Sciex API2000 LC-MS/MS

This triple quadrupole instrument also has the ability to analyze high molecular weight compounds from samples including air, water, dust, food, soil and sediment. It requires 10-15 uL of samples and run times are approximately 20 minutes per sample. It is currently applied to the determination of hexabromocyclododecanes (HBCDs) and perfluorinated chemicals (PFCs).

As an illustration of detection limits achievable on this instrument, individual HBCD diastereomers may be detected in a 1 g sample of dust at 0.1 ng g^{-1}

Triple quadropole MS/MS is one of the most sensitive and specific technologies available for small molecule quantitation