

Environmental Central Facility



The Hong Kong University of Science and Technology

High Performance Liquid Chromatography (HPLC) – with Photodiode Array Detector (PAD) & Fluorescence (FLR) Detector
Brand: Waters Corporation, USA
Model No.: alliance



The instrument provides separation and qualitative/quantitative determination of samples and is widely applied in environmental, pharmaceutical, and biochemical analysis. The HPLC system is equipped with quaternary pumps, four eluting chambers, automatic sample injection device holding up to 120 vials, temperature-controlled column compartment, degassing system and dual detectors: multi-wavelength fluorescence (suitable for detection of fluorescing substances) and diode-array detectors (having absorbance in UV/Vis wavelength). The system is controlled by Empower3™ software and work station for simultaneous 2D or 3D operation.

Inductively Coupled Plasma Optical Emission Spectrometer (ICP – OES)
Brand: Varian, Australia
Model No.: 725-ES



This high sample throughput ICP-OES is capable of measuring concentrations of multi-metals at ppm level. The Auto-sampler can handle as many as 180 samples. For determination of certain elements whose sensitivity is lower (e.g. mercury), the optional Vapor Generation Accessory (VGA) can be equipped to enhance the sensitivity while the detection limit can be lowered to ppb level.

Tabletop Scanning Electron Microscope/ EDXS System
Brand: Hitachi, Japan
Model No.: TM3030 Table top Microscope



The table top Scanning Electron Microscope (SEM) can magnify an object from 50 to 30,000 times. The microscope can be used for image recording, qualitative elemental analysis and morphological investigations of specimen including biological sample, print circuit board, particles, etc. In addition, a Silicone Drift Detector (SDD) is installed in the microscope for elemental composition analysis. Elements from Boron to Americium can be detected and mapped on the specimen image.

Total Organic Carbon Analyser (TOC)
Brand: Shimadzu, Japan
Model No.: TOC-VCPH



The TOC analyzer measures the carbon content of a sample by combustion catalytic oxidation (680°C) and Non-Dispersive Infrared Detector (NDIR) method. The system is composed of an Auto-sampler ASI-V, Total Nitrogen Unit TNM-1 and Solid Sample Combustion Unit SSM-5000A. It can analyse total organic carbon and inorganic carbon contents on a wide range of samples including fresh water, polluted water, and solid samples. The measurement range is 0 to 25,000 and 0 to 30,000 (mg/L) for Total Carbon (TC) and Inorganic Carbon (IC), respectively. The detection limit is as low as 4 µg/L.

RAMAN Microscope
Brand: Perkin Elmer, USA
Model No.: RAMANMICRO 300



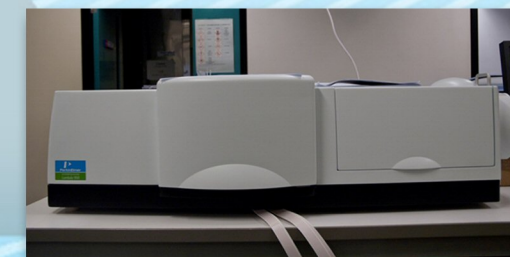
This RAMAN Microscope can generate Raman spectrum, ranging from 3500 to 95 cm⁻¹ and with resolution down to 1 cm⁻¹ to aid qualitative analysis of solid samples. It is used in many varied applications including pharmaceuticals, polymer study, printing and chemical analysis.

Headspace sampler- Gas Chromatograph (GC) with Electron Capture Detector (ECD)
Brand: Agilent, USA
Model No.: 7694E Headspace sampler-7890A GC



The GC-ECD can separate and quantitatively measure organic compounds that are volatile enough to be vaporized without decomposition in the Headspace 7890A system (ambient to 200 °C). The ECD installed in the GC is sensitive towards organic molecules that contain halogen, peroxides, quinones and nitro functional groups. Molecules with double bond can also be determined but with less sensitivity.

UV-Visible NIR Spectrometer
Brand: Perkin Elmer, USA
Model No.: Lambda 950



The spectrometer is a high performance double beam, double monochromator instrument that can cover a wavelength range from 175 to 3300 nm with a spectral resolution of 0.05 nm. It can be used for colorimetric measurements, scanning the spectrum of a sample, kinetic measurement of a reaction, studying the optical properties of material, etc. The unit is installed with a Peltier cooling system for controlling the liquid sample temperature during the measurement. The spectrophotometer is installed with a 150 mm integrating sphere for studying reflectance, scattering and transmission properties of solid or highly absorbing samples.

Gas Chromatograph (GC) - Mass Selective Detector (MSD)
Brand: Agilent, USA
Model No.: 7890A GC – 5975C Mass Selective Detector



The GC-MSD is composed of a split/splitless capillary injector, an automatic liquid sampler and a single quadrupole mass spectrometer that can cover the mass up to 1050 Da. It can separate and quantitatively measure organic compounds that are volatile enough to be vaporized without decomposition in the split/splitless injector. MSD can produce a 3D data set (both chromatogram and mass spectra at the same time) for better understanding of the components in a sample.

Energy Dispersive X-ray Fluorescence (EDXRF)
Brand: PANalytical, USA
Model No.: Epsilon 5



EDXRF is used to determine elemental composition of aerosol filter samples, thin film, soil, metal, oil, and liquid (non-volatile) samples. It can detect elements in the periodic table from Na up to U with a general detection limit down to ppm level.

Environmental Central Facility (ENVF) is a facility under the Institute for the Environment. ENVF is equipped with state-of-the-art instruments and has developed various systems and technologies for environmental research studies. Our services are broadly used by the community at HKUST, sister institutions, governmental departments, and clients from regional industries.

Environmental laboratory services

ENVF houses a wide range of equipment in the laboratory which are available for chemical analysis related to environmental research work. Our technical team also provides training to students and researchers on equipment usage.

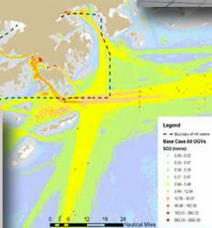
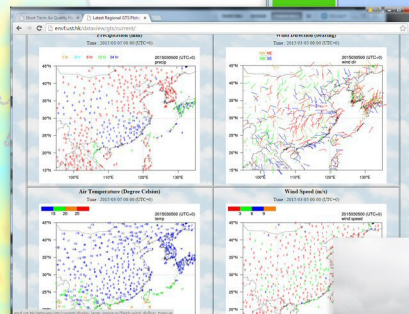
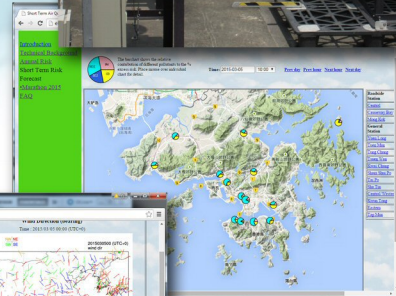
Environmental data system services

ENVF offers data base support for users to access our environmental and atmospheric data.

<http://envf.ust.hk/dataview>

Environmental project support services

ENVF also assists faculty and researchers in managing their environmental projects relating to budget control, resources planning, and technical support in equipment installation and calibration.



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