

Analytical Equipment and Methods

Adsorbable organically bound halogen (AOX)

Amino acid analysis (AAA, Biochrom, Waters AccQ-Tag™ System)

Analytical ultracentrifugation (AUC)

Analyzers for TOC, AOX, POCl, TNb, DOC, DON

Atomic absorption spectrometry (FAAS, ETAAS, CVAAS)

Atomic emission spectrometry (ICP-AES, ICP-OES)

Boiling point

Calorimetry

Capillary electrophoresis (CE, various Beckmann and Agilent instruments, options for detection include UV absorbance with DAD, LIF and UV-CCD capillary imaging)

Capillary viscosimeter

Chiral separation techniques (CE, HPLC, GC, SFC)

Chromatography (All modes of LC, GC, many options of detectors and hyphenation)

Circular dichroism (CD)

Cloning

Combustion analysis (C, H, N, O, S, halogens, inorganic ash, residue on combustion)

Conductivity measurements

Confocal laser scanning microscopy

Contact angle measurements

Controlled stress rheometer

Densitometer (UV/VIS, fluorescence)

Density measurements (fluids, powders)

Differential scanning calorimetry (DSC)

Dissolution calorimetry

Dissolution testing (manual and autosampling)

Dissolved organic carbon (DOC)

Dissolved organic nitrogen (DON)

DNA preparation

DNA sequencing (AB 3730xl)

Dynamic vapor sorption (DVS)

EDX (energy dispersive X-ray analysis)

Electroanalytical methods (polarography, tensammetry, voltammetry, coulometry, amperometry, electrosynthesis)

Electrokinetic sonic amplitude (ESA)

Electron microscopy (SEM, TEM)

Electrophoresis (capillary or slab-gel formats)

Elemental analysis (see combustion analysis)

ELISA

Endotoxin determination (LAL)

Fluorescence microscopy

Fluorescence spectroscopy

Fourier transform infrared spectroscopy (FTIR)

Gas chromatography (MS, TCD, FID, micro-GC, headspace GC)

Genotyping

Gel filtration chromatography (GFC)

Gel permeation chromatography (GPC)

Gravimetric tests (loss on drying, total ash, loss on ignition, residue on ignition, sulphated ash)

Halogen, halogenide determinations

Headspace gas chromatography (static, dynamic)

Heavy metal screening (ICP-OES, ICP-MS)

Hot stage Raman microscopy

Hot stage X-ray diffraction analysis (controlled temperature and humidity)

HPLC (High Performance Liquid Chromatography, see chromatography)

Hyphenated techniques (LC-MSⁿ, LC-UV-RI-ELSD-ECD-FLD-MALS, GC-MS, head-space GC-MS, TG-IR, ICP-MS, ICP-OES)

Infrared microscopy

Infrared spectroscopy, (see fourier transform infrared spectroscopy)

Inorganic elemental mass spectrometry (ICP-MS)

Inductively coupled plasma atomic emission spectrometry (ICP-AES, ICP-OES)

Inductively coupled plasma mass spectrometry (ICP-MS)

Inhaler testing (NGI)

Ion chromatography (Dionex HPAEC with PAD, see chromatography)

Isoelectric focussing (capillary or slab-gel formats)

Isothermal titration calorimetry (ITC)

Karl-Fischer water determination (Special equipment to determine water content in lyophilisates and ampoules) and micro titration methods

Kjeldahl nitrogen determination

LAL testing (endotoxins)
Liquid chromatography, see chromatography

Malvern (particle sizing)
Mass spectrometry (LC-MS/MS (Iontrap, Q-TOF), MALDI-TOF/TOF, ICP-MS, GC-MS)
Micro analytical combustion methods (see combustion analysis)
Micro GC
Micro methods for the determination of water content (Karl Fischer titration). Special equipment to determine water content in lyophilisates and ampoules
Micro titrations, macro titrations
Microplate reader
Microscopy (light microscopy, SEM, TEM, EDX elemental analysis, Raman, fluorescence, confocal)
MiniAPI (biochemical identification of bacteria)

Next generation impactor (NGI) - Inhaler testing
Nitrogen determination according to Kjeldahl
Nuclear magnetic resonance spectroscopy (NMR)

Optical emission spectrometry (ICP-OES, fluorescence, phosphorescence)
Optical rotatory dispersion (ORD)
Osmolality, osmolarity (freezing point depression)

Particle sizing (laser light diffraction, sieving, microscopical, Malvern & Sympatec, aerodynamic size distribution)
PCR
Peltier-based and gradient thermocyclers
Peptide mapping (LC-MS/MS for identification, LC-UV for quantification)
pH
Pharmacopeial methods (USP, Pharm. Eur., BP, JP, Pharm. Helv.)
Photometry
Physical measurements (density, viscosity, log P, pKa, conductivity, solubility, surface tension, refractive index, osmotic pressure, melting point, specific heat capacity)
POCl (purgeable organic halogens)
Polarimetry, ORD
Polarography
Pore sizing

Quantitative and semiquantitative elemental

determinations (FAAS, ETAAS, CVAAS, ICP-OES, ICP-MS, XRF)

Raman microscopy
Raman spectroscopy, Fourier transform (FT Raman)
Reflectance spectroscopy
Residual DNA (Threshold™)
Rheology, including oscillation, yield stress

Scanning electron microscopy with energy dispersive X-ray analysis (EDX)
Size exclusion chromatography (SEC)
Slab-gel electrophoresis (SDS-PAGE, with visualisation using Coomassie brilliant blue, silver staining or western blotting)
Solubility measurements
Specific surface area (BET)
Spectroscopy (IR, Raman, NMR, fluorescence, phosphorescence, UV/VIS, CD)
Surface tension (plate and ring methods)
Sympatec Helos (particle sizing)

Thermogravimetry (TG, TG-FTIR)
Thermomicroscopy
Threshold™ method (molecular devices, for residual DNA)
Titration calorimetry
Titrations
TLC, including application devices and scanners
Total organic carbon (TOC)
Total nitrogen bound (TNb)
Trace analysis
Transmission electron microscopy (TEM)

Ultracentrifuge, analytical (AUC)
UV/VIS-spectroscopy

Vapor pressure measurements
Vapor sorption measurements (DVS)
Videodensitometry, quantitative and qualitative
Viscosity measurements (capillary and rheometer)

Water determination (see Karl Fischer)
Western blotting

X-ray fluorescence spectrometry (XRF)
X-ray powder diffraction (XRPD)

Zeta potential (ESA)