



Materials Analysis

A solution for every problem

Materials Analysis is part of the extensive range of services you can access at Philips Innovation Services on the High-Tech Campus Eindhoven. From device technologies and systems creation, to materials analysis, test and measurement, discover the possibilities yourself at www.innovationservices.philips.com

In today's high-tech innovations, understanding the materials and processes is often key to success. And that's where Philips Innovation Services can help you, offering a range of solution-oriented services in materials characterization. You can use our expertise for quick problem-solving or longer-term support for your research, development and manufacturing programs.

Why choose Innovation Services?

- Easy access to cutting-edge expertise and high tech infrastructure
- Asset-rich with the latest equipment, saving you investment in high-cost apparatus
- Fast, efficient and cost-effective, accelerating your time to market

Extensive range of materials analysis services including

- Trace analysis and contamination control
- Inorganic materials characterization
- Surface and thin film characterization
- Advanced imaging
- Molecular analysis
- Glass characterization
- Failure analysis
- Quality and Reliability



Capabilities addressing all your analytical needs

Chemical analysis

Expertise

- Determination of chemical composition (from main constituents to ultra-traces) of solid materials, solutions and gases
- Characterization of glasses and powders
- Optical characterization of thin layers
- Support of bio-projects, e.g. dissolution tests
- Operational analysis of lighting products

Techniques used

Titrimetry, AAS, ICP-AES, (LA)-ICP-MS, FIMS, Characterization of glasses (viscosimetry, stress, thermal expansion), Ellipsometry, XRF, Element specific techniques (C,N,O,H,S), Powder characterization (BET), TGA(MS), TOC, Radiochemistry, gas MS, IC-MS, QCM.

Typical examples

- Main composition and impurities in different salt pellets
- Traces in dielectric materials
- Accurate composition of thin layers
- Trace contaminants in cleanroom air and gasses
- Valence state of metals in oxidic materials
- Concentration of rare-earth elements in phosphors and organic lipids
- Accurate composition of glasses, ceramics, composites, metals and alloys
- In-situ, in-line and at-line monitoring of chemical processes
- Total organic carbon in gas-systems
- Leak detection methods
- Permeability of and kinetics in foils
- Ultra pure water analysis

Molecular and structural analysis

Expertise

- Characterization of materials with respect to structure, composition and orientation
- Characterization of gas, liquids and solids (under non-ambient conditions)
- Time-resolved and in-line analysis
- Characterization in complex (biomedical) matrices as well as in devices
- Identification and molecular weight (distribution) of organic materials
- Phase, texture and stress analysis in inorganic and thin-film materials
- Competitor screening
- Experimental design and chemometrics

Techniques used

Chromatography (GC, HPLC, GPC), Spectroscopy (FT-IR, NIR, UV/Vis, Fluor, Raman, NMR, TOF-MS, ion trap MS), XRD, AFM, SPM, Thermal Analysis) and Rheometry.

Typical examples

- In-line characterization of curing in coatings
- Analysis inside working devices such as polyLEDs or batteries
- Imaging of biological samples like hair or teeth
- Emission measurements in processes and cleanrooms
- Assessment of MRI contrast agents
- Analysis of vacuum-deposited, multi-phase semiconductor materials
- Determination of thermal stability, phase transitions and physical properties of polymers and mixtures

Surface and thin-film analysis

Expertise

- Chemical composition of surfaces and thin films
- Depth profiles and mappings of dopants and contaminants
- Characterisation of interfaces
- Morphology and microstructure of (patterned) thin films and whole products
- Cross-sectioning with nanoprecision and nanomachining

Techniques used

SEM, EPMA, XRT, TEM, FIB, XPS, AES, SIMS, TOF-SIMS, RBS, ERD.

Typical examples

- Quality check of seals and electronic components inside lamps
- Layer thickness, step coverage, crystallinity and grain size of thin films
- Root cause analysis of defects in lamps, displays and coatings
- Size and shape distribution of nanoparticles and vesicles for biosensors, molecular imaging and functional coatings
- Characterization of self-assembled monolayers and biomolecule adsorption
- Dopant profiles in semiconductor devices
- Reverse engineering of displays, solar cells, lamps, etc...



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