



Material Investigations

RISE can provide chemical analyses and troubleshooting to answer a wide range of questions related to for example material development, compliance with regulations, benchmarking and customer complaints.

Our approach "Material Investigations" is based on a close dialogue with our customers. In the first stage, we endeavour to fully understand the customer question. We suggest an analytical set-up by combining RISE's competences within organic, inorganic and microscopic analyses, and provide advice on sampling and sample handling. During the analytical stage, the dialog with the customer continues, if needed. When the report has been delivered, we can help with interpretations and advise on how to proceed.

Typical customer questions

- What chemicals does the material contain?
- Does the material release harmful substances?
- Is the product better than other products on the market?
- Can we replace or reduce the amount of material/chemicals without affecting the performance?
- What caused a particular customer complaint?
- What happens upon ageing?

Contact persons

Anna Jacobs, director Chemical Analysis
+46 8 676 7152
anna.jacobs@ri.se

Kai-Yee Thim, director Product Safety
+46 8 676 7079
kai-yee.thim@ri.se

INVESTIGATIONS, EXAMPLES

- Screening of material composition
- Biomass characterization
- Polymer characterization
- Identification of additives (plasticizers, inks, glues etc.)
- Compliance with regulations for food contact materials
- Test of barrier properties
- Causes for defects in products
- Causes for odour or off-flavour
- Causes for deposits and scaling on process equipment

ANALYTICAL TECHNIQUES, EXAMPLES

Light microscopy

Visual inspection by light microscopy is the basic first step and gives initial information in order to proceed with the problem.

Scanning electron microscopy with energy-dispersive X-ray spectroscopy (SEM-EDS)

SEM-EDS gives electron micrograph of the sample, and the elemental composition of inorganics.

Gas chromatography/mass spectrometry (GC/MS)

GC/MS can be used for identification and quantification of organic components up to ~500 Da. Identification of the sample components is facilitated by reference spectra and libraries. The technique is particularly well suited for analysis of volatile components.

Pyrolysis-gas chromatography/mass spectrometry (Py-GC/MS)

The pyrogram obtained gives a unique fingerprint which allows identification of unknown samples using reference spectra/libraries. Very small amounts of sample (about 1 mg) can be analysed.

Fourier-transform infrared spectroscopy (FTIR)

Using FTIR, a "fingerprint" that represents the functional groups in the sample may be acquired. Identification of the sample components is facilitated by reference spectra and libraries, especially for polymers and plastics.

Atomic emission spectroscopy (ICP-AES)

A variety of different metals and elements may be quantified using ICP-AES.

Product safety analyses for food contact materials (FCM)

Product safety analyses include overall and specific migration to food simulants, analysis of printing ink components, analysis of mineral oils (MOSH/MOAH), Primary Aromatic Amines (PAAs), Bisphenol A, Photoinitiators etc.

Barrier properties

- Test of barrier properties against migration of organic compounds (single-sided headspace cell)
- Oxygen and water vapour transmission (ASTM-rated Mocon equipment)

ACCREDITATION

Our laboratory is accredited according to ISO 17025.