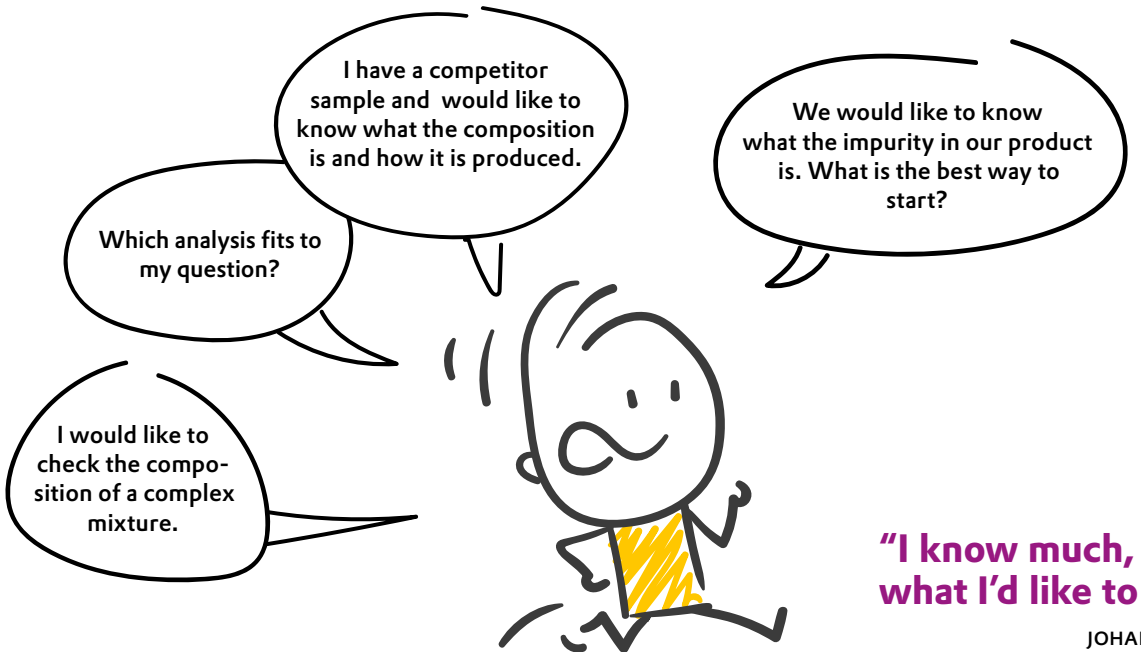
Focus Analytics

NEWSLETTER OF RD&I ANALYTICS MARCH 2022

Analysis of plastics and complex mixtures



"I know much, but all is what I'd like to know."

JOHANN W. VON GOETHE

Do you also have such questions? Do you need to analyse the composition of a plastic or clarify discrepancies in the mass balance of a complex mixture?

IF SO, THE PLASTICS ANALYSIS WORKING GROUP IS THE RIGHT PLACE FOR YOU.

The Plastics Analysis Group separates your samples, analyses the fractions using various techniques, and puts the puzzle pieces of the individual analyses back together in order to form an overall picture.

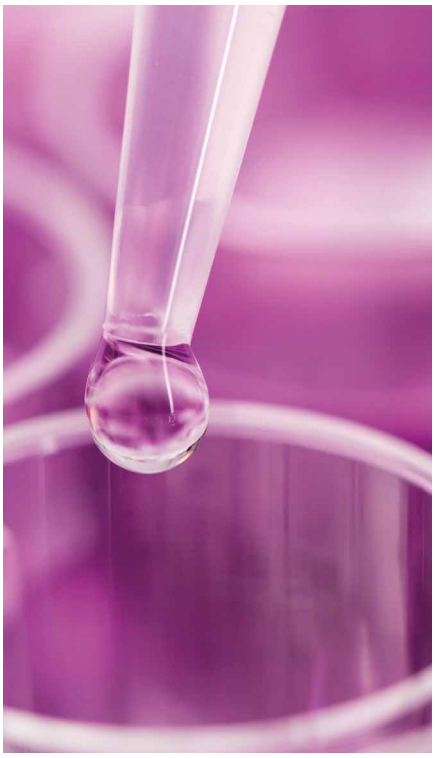
WE OFFER YOU SOLUTIONS FROM A SINGLE SOURCE FOR:

- Competitor analyses
- Polymer composition
- Identification of additives
- Complaint analyses
- Investigation of surface coverings
- Characterisation of unknown samples
- Investigation of process residues
- Isolation of turbidity and inclusions
- Thermal analyses
- Tailored consulting for complex, analytical questions
- Assistance with patent disputes

PRODUCT KNOWLEDGE IS CRUCIAL!

**The Plastics Analysis Group deals with various issues in the fields of synthetic polymers and plastics.
However, questions from other areas of industrial chemistry have also always been part of our field of activity.
As a result, we have many years of experience with various product groups, including:**

- Technical polymers
- Oil additives
- Pharmaceutical polymers
- Dispersions
- Paints and varnishes
- Moulding compounds, films, and foams
- Surfactants and emulsifiers
- Fillers
- Road coatings
- Reaction residues



THE RIGHT CHOICE OF SEPARATION METHOD

The key to the success of a complete analysis is the right choice of a suitable separation method from the outset. In addition to classical physical-mechanical separations such as sedimentation, centrifugation, and various filtration techniques (e.g. vacuum, pressure and ultrafiltration), thermal separation processes such as distillation or separations based on solubility are also possible. We also use several size reduction techniques and can carry out various extractions (e.g. microwave-accelerated extraction, Soxhlet) or preparative chromatography if required.

SUCCESS FACTOR – PROJECT COORDINATION AND INTERDISCIPLINARY COOPERATION

The Plastics Analysis Group is your direct contact. After an initial assessment, samples are separated and partial orders are commissioned to a wide variety of analytical laboratories, coordinated by our group.

In this way, the Plastics Analysis Group uses the entire spectrum of analytical techniques of Evonik Analytics in an interdisciplinary manner. This includes intensive cooperation with our colleagues in mass spectrometry, NMR spectroscopy, infrared and Raman spectroscopy, chromatography, electron microscopy, and inorganic element analysis.

The example of the characterisation of polymers shows very clearly that often several and complex methods must be used and combined to describe a substance conclusively.

Figure 1 shows the basic procedure for a full analysis using a competitor product as an example. Various spectroscopic and chromatographic methods are necessary for the characterisation and structural elucidation of the polymer alone. In addition to the polymer, additives (e.g. fillers and pigments) as well as stabilisers, plasticisers, regulators, solvents, dyes, flame retardants, emulsifiers, and release agents are analysed. In order to identify and quantify these substances completely, several separation steps and analysis techniques are necessary. Furthermore, a literature search (e.g. in patents) might be required.

QUALITATIVE AND QUANTITATIVE SUMMARY OF ALL INDIVIDUAL RESULTS

We coordinate all analyses for you and determine the appropriate methods for the current problem. The results of the individual separations and methods are examined and evaluated for you, and any contradictions are investigated.

The final summary of the results includes not only the qualitative but also the quantitative composition of your sample (Fig. 2). Your question is answered to the point. We are also available for a subsequent presentation and discussion of the results.

Do you have any questions? We are happy to provide you with an individual concept or offer.

Please do not hesitate to contact us!

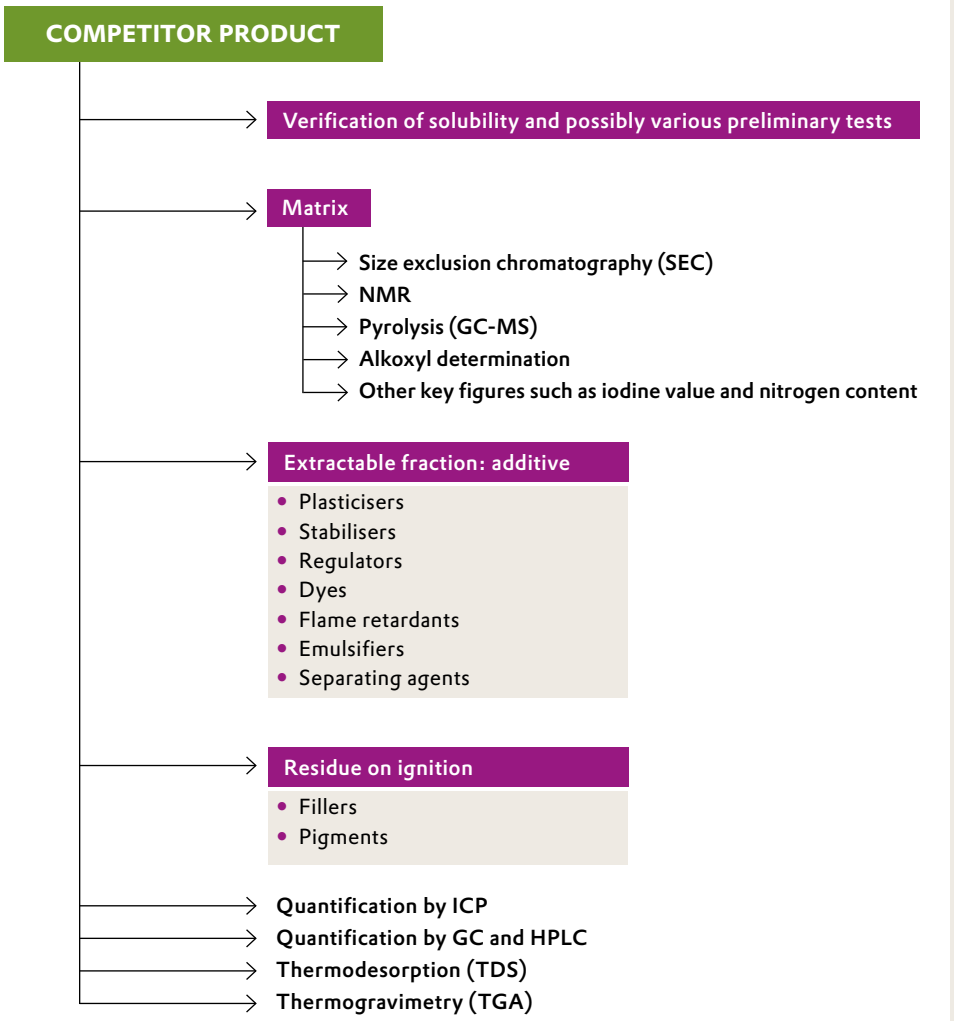


Figure 1:
Exemplary flow chart for a competitor analysis of a polymer matrix

RESULT OF A COMPETITOR ANALYSIS

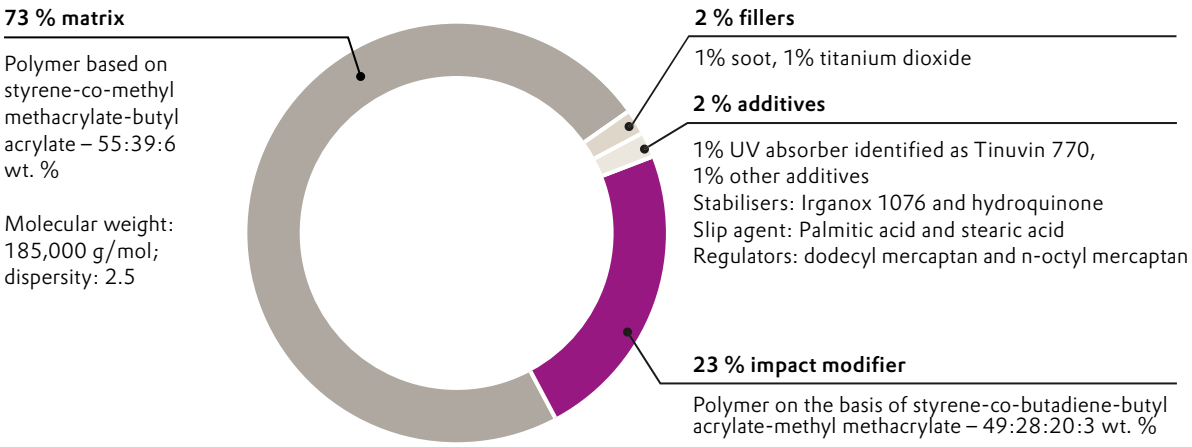


Figure 2: Identification and quantification of polymers, fillers, and additives

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Last revised:
March 2022