

Identifying Surface Contamination using the high throughput MiniSIMS

Mini SIMS



MiniSIMS not only detects superficial organic contaminants but can also discriminate between members of the same polymer family.

- Rapid Analysis of Sub-Monolayer Contamination
- Polymer Identification by Characteristic Peaks
- Determination of Polymer Structure by Library Matching

The cleanliness of a surface is an important property in many industrial situations. In particular, contamination of a substrate surface before paint or other coating material is applied will lead to poor adhesion. Monitoring to detect such contamination is part of the solution, but the full answer requires a precise identification of the contaminant. Complete knowledge about a contaminant indicates the best method for its removal, but more importantly allows its likely source to be traced and eliminated.

When contamination is present as a surface film rather than as a particle, it may be only a monolayer in thickness and invisible to the naked eye. Thin film contamination of this type is frequently organic rather than inorganic in nature, so analysis techniques that only identify the component elements are therefore of limited use. The extra information on molecular structure that is revealed by mass spectrometry is therefore vital in building the complete picture.

It is possible to try to dissolve the contaminant and perform a bulk analysis, but SIMS offers a more convenient and direct method to identify surface contamination in situ. In addition, focusing the primary ion gun gives a spatially resolved analysis that allows the distribution of the contaminant to be established. This distribution may hold additional important clues about the origin of the contamination.

This application note demonstrates how the MiniSIMS provides a fast method to detect and distinguish between similar but different members of the silicone (siloxane) family. The mass spectra show clear and immediate differences as the side chains on a common polymer backbone are varied.

See overleaf for more detailed information.

