

## Ciba® Testing Services

### Case Study

#### Identification of undesired micro particles in a ink formulation

#### Problem

Undesired micro particles (<20µm) were observed in the formulation of a multi component red ink used for ink jet applications. These unidentified particles caused scratches in the ink films. Knowledge of the nature of the particles was mandatory to develop a new and improved formulation.

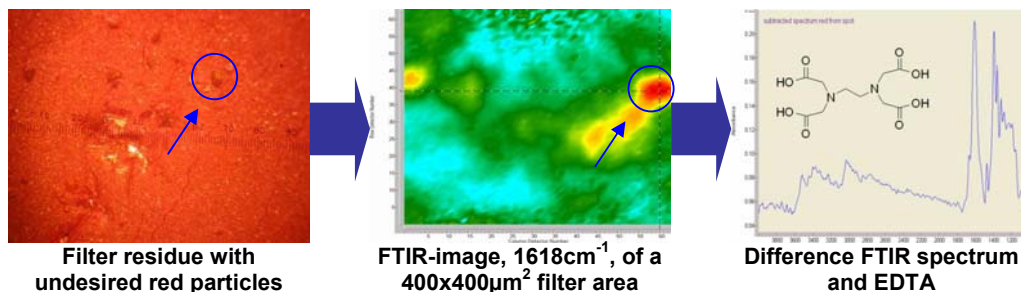
#### Solution

Several analytical techniques, such as transmission electron microscopy (TEM) and matrix assisted LASER desorption ionization (MALDI) mass spectrometry, as well as attempts to isolate the micro particles had already been applied without giving a unique result.

Identification of the particles within the filtration residue was achieved by applying Fourier-Transform Infrared Spectroscopy (FTIR) Imaging Techniques. Using a 64x64 Focal Plane Array (FPA) IR detector, spectra of the filtration residue were performed on the 5µm resolution level. Data mining yielded the identification of the particles, namely metal complexes with EDTA. Based on those results, a modified formulation was developed and EDTA was replaced by an alternative substance.

#### Application/Use

Recent developments of surface sensitive IR techniques such as Attenuated Total Reflectance (ATR) in combination with FPA based FT-IR Imaging Techniques are used to identify substances within a matrix on a microscopic scale. Besides the mentioned example, aggregates and impurities within polymer products, in masterbatches, and on metal surfaces were successfully traced and identified. These techniques are also applicable in depth profiling and diffusion studies.



#### Your Advantage

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