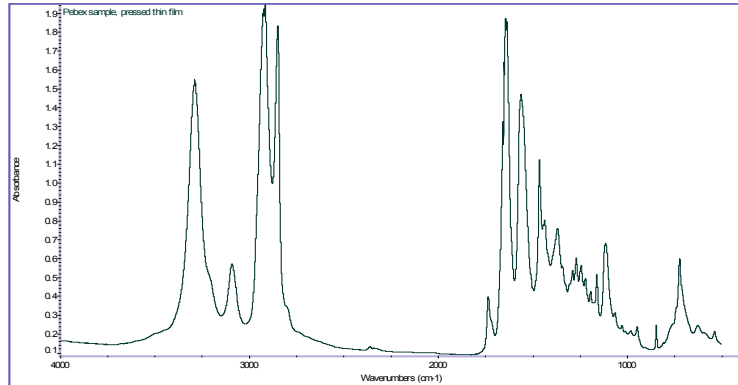


FTIR ANALYSIS- FOURIER TRANSFORM INFRARED SPECTROSCOPY

Fourier Transform Infrared Spectroscopy (FTIR) identifies chemical bonds in a molecule by producing an infrared absorption spectrum. The FTIR generates an infrared spectral scan of samples that absorb infrared light. Metals do not absorb infrared light, but polymers that contain metals can be scanned with FTIR.

FTIR is important for screening, and identifying polymer or plastic samples. See below for Analysis applications



A material's absorbance of infrared light at different frequencies produces a unique identification based upon the frequencies at which the material absorbs infrared light and the intensity of those absorptions. The resulting spectral scan is typically specific to a general class of material.

Example: Nylon scans have unique similarities but are definitively different than Polycarbonate scans.

Unknown spectral scans can be analyzed to determine the base material of the unknown by comparing their scan to spectral scans of known materials that are stored in a computer-based library

The resulting spectra produce a profile of the sample, a unique molecular "fingerprint" can be used to easily screen and scan samples for many different components. FTIR is an effective analytical instrument for detecting functional groups and characterizing materials.

Sampling Techniques Include; Transmission, solvent extraction, thin films, diffuse reflectance, and pressed KBr pellets. .

Samples the size of a single resin pellet can be scanned by reflective FTIR. Samples, which can be easily tested by reflective FTIR, include polymer pellets, parts, opaque samples, fibers, powders, wire coatings, and liquids.

An FTIR spectral analysis can easily identify classes of polymers such as Nylons, Polyesters, Polypropylenes, Polycarbonates, Polyurethanes, Acetals, or Polyethylenes.

FTIR spectral scan alone may not identify the type of Nylon, Pebax, or Polyester, identify a Polypropylene or Acetal as a homopolymer or copolymer, or determine whether a Polyethylene is a high density or low density material. Further identification using other analytical techniques is necessary.

FTIR Analysis Applications:

- Quantitative Scans
- Qualitative Scans
- Solids, Films, Liquids
- Organic Samples

- Inorganic Samples
- Plastics
- Polymers
- Contamination identification
- Impurities Screening
- Formulation, Deformulaation
- Packaging materials, foams, films, bubble wrap
- Medical devices, tubing, coatings, adhesives
- Personal care products, Cosmetics
- Consumer goods
- Toys
- Household products
- Building Products