

MATERIAL IDENTIFICATION IN MEDICAL TECHNOLOGY

TASK

The characterization of medical devices or the underlying starting materials often requires the use of a wide range of analytical and physical methods. This involves a great deal of time. In many cases, however, quick material information is needed first, which is only refined later with further analyses.

SOLUTION

High-resolution NMR spectroscopy is a versatile method for quickly gaining an overview of a medical product. It is a method for detailed structural elucidation and quantification of organic substances. NMR spectroscopy can be applied to all types of organic compounds including polymers. Mixtures can be quantified and impurities can be detected.

Industries

Medical technology

Analysis goals

Quick material overview with complex matrix

Materials

Composite material, product preparations

Analysis method

¹H-NMR (Nuclear Magnetic Resonance)

Supplementary procedures

Extraction

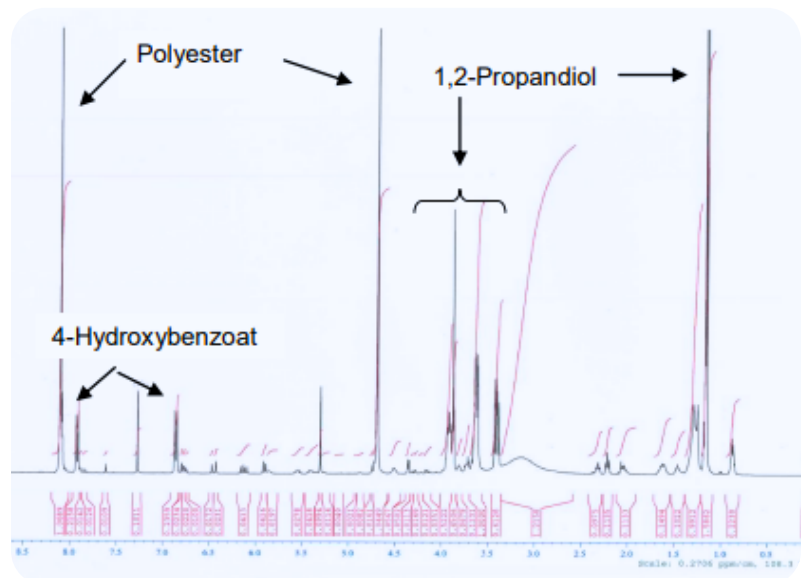
Related questions

Purity determination, release analysis



EXAMPLE - HEAT PATCH

In a commercially available heat patch, the active ingredient nonivamide is already detectable in the spectrum after simple extraction with dichloromethane. However, further information on the carrier liquid (1,2-propanediol), preservative (4-hydroxybenzoate), adhesive (acrylate) and fabric material (polyester) can also be read from the spectrum.



EXAMPLE - WARMING OINTMENT

In comparison, a spectral section (only the aromatic region) of the CDCl₃ extract of a warming ointment is shown. Even without upstream processing of the ointment material, the active components nicoboxil and nonivamide can be identified and roughly quantified despite the presence of the ointment base. The quantity ratio of nicoboxil to nonivamide is determined from this spectrum to be approx. 91:9; the package insert for the warming ointment states 86:14.

