



U.S. Pharmacopeia
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Traditional Applications and Recent Advances in Nuclear Magnetic Resonance

**Presentation: Quality of Manufactured Medicines - Measurement Sciences
Advanced Analytical Technologies**

Wednesday, September 23, 2009, 10:30 a.m. to 12:30 p.m.

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This presentation will review some of the current uses of NMR in an industrial setting. These will include typical uses of one- and two-dimensional NMR to determine structures of small molecules as well as natural and synthetic polymers. The quantitative uses of both ^1H and ^{13}C NMR to determine the composition and molecular weight of polymers will be discussed. We will also show how NMR can be used to determine the absolute purity of reference standards. Examples of the use of NMR to obtain tertiary protein structures, and how it was used with the contamination of the drug heparin will be given.

In recent years a combination of higher magnetic fields, better electronics and a number of innovative probe designs has stretched the limit of detection to low sample levels that would not have been considered achievable a decade ago. Examples will be shown of how progress in these areas now allow detection of solid-like samples through fast spinning at the magic angle, low levels of impurities through the use of cryoprobe technology and the detection of μg quantities of materials using 1 mm cryoprobes.

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