

Solid-State NMR Spectroscopy: Introduction and Application to Polymorphism Studies

Susan M. De Paul

Solvias AG, Klybeckstrasse 191, Postfach, CH-4002 Basel, Switzerland

The ability of a compound to crystallize in different forms, known as polymorphism, is of great importance to the pharmaceutical industry as polymorphs can have different bioavailability, processability, and stability. In this lecture, the use of solid-state nuclear magnetic resonance (NMR) in polymorphism studies will be reviewed. Differences between solution-state and solid-state spectra will be discussed, and the "workhorse" techniques of magic-angle spinning (MAS), cross polarization (CP), and dipolar decoupling will be introduced and explained. Several case studies from the pharmaceutical literature will be presented to illustrate the range of information obtainable from solid-state NMR spectroscopy. The advantages and disadvantages of the technique compared to other methods (X-ray powder diffraction, vibrational spectroscopy) will be discussed.

References

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- 3 G. A. Stephenson et al., *Adv. Drug Delivery Rev.* **48**, 67-90 (2001).