

## Solid-State Accessory

The Bruker AV-III-400 Solid State Accessory is Not Yet Operational. The Probe was Sent Back to Bruker for Repair.

Solid-State NMR is Applicable to Polymers and Materials: Any Sample That Can Be Ground into a Powder.

- Sample is Packed into a 3.2 mm (OD) Rotor
- Rotor is Inserted into Top of Magnet Bore
- In the Probe, the Rotor is Tilted by an Angle of 54.74 Degrees (the “Magic Angle”)
- The Sample Spins at Speeds Up to 25,000 Hz (Compared to 20 Hz for Liquid Samples)
- $^1\text{H}$  Decoupling is Applied with High Power (50 W)
- Observe  $^{13}\text{C}$ ,  $^{29}\text{Si}$ , etc. (Not  $^1\text{H}$ )

The Technique is Called CP-MAS, for Cross-Polarization Magic Angle Spinning. Cross-Polarization is a Way of Exciting the  $^{13}\text{C}$  via the Protons, and Magic Angle Spinning Mimics the Rapid Motion of Molecules in Solution. Spectra of Similar Quality to Solution State NMR Can Be Obtained.