

## **Solid State NMR Crystallography of Inorganic Materials**

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Solving structures on polycrystalline powders is still today a challenge that has many demands : intensity of the diffraction signal, prior knowledge and a reasonable structural models. It has been shown that in solution, NMR can solve a structure in the sense of a molecular structure. Solving structures of inorganic compounds or organic-inorganic crystals requires profoundly different strategies to what has been done up to now by NMR.

The principles of structure determination has therefore been reinvestigated, with special emphasis to space group determination [1] to unit cell estimation by NMR. Actually the principles of NMR crystallography on powders will be explained, with a special focus on the use of Wyckoff spectra. Once those principles exposed, we will show how we can combine efficiently NMR, diffraction and modeling [2] to propose proper structure elucidation and therefore new strategies for solving the many cases where crystals can not easily be obtained.

Aluminophosphate structure elucidation, solved by combination of modeling diffraction and solid state NMR, on powders will be exemplify this strategy. Furthering the discussion on such strategies will lead us to engage along the polymorphism analysis by solid state NMR, a key area in many pharmaceutical applications.

[1] Taulelle F., *Solid State. Sc.*, 2004, **6**, 1053. [2] Dutour J., Guillou N., Huguenard C., Taulelle F., Mellot-Draznieks C., Férey G., *Solid State. Sc.*, 2004, **6**, 1059.

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