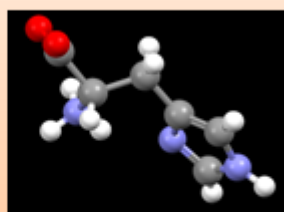


Solid-State NMR Meets Electron Diffraction

NM170002

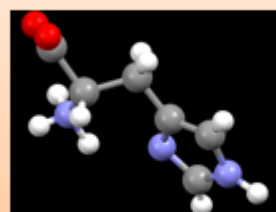
To distinguish crystalline form of small molecule, powder X-ray diffraction and ^{13}C CPMAS solid-state NMR are widely used. Here, we introduce a combined approach of ^1H solid-state NMR at ultrafast MAS and electron diffraction using TEM to overcome the difficulty which powder X-ray and ^{13}C CPMAS solid-state NMR have.

Can we distinguish crystalline form between



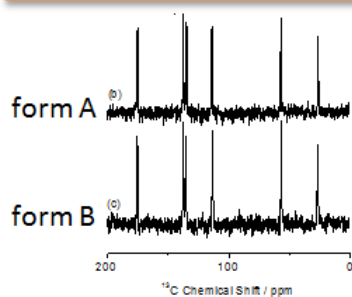
L-histidine
(orthorhombic: form A)

?



L-histidine
(monoclinic: form B)

Solid-state NMR: ^{13}C CPMAS



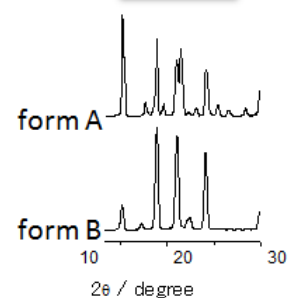
Similar ^{13}C CPMAS due to similar conformation.

Conventional method



Challenges

pXRD



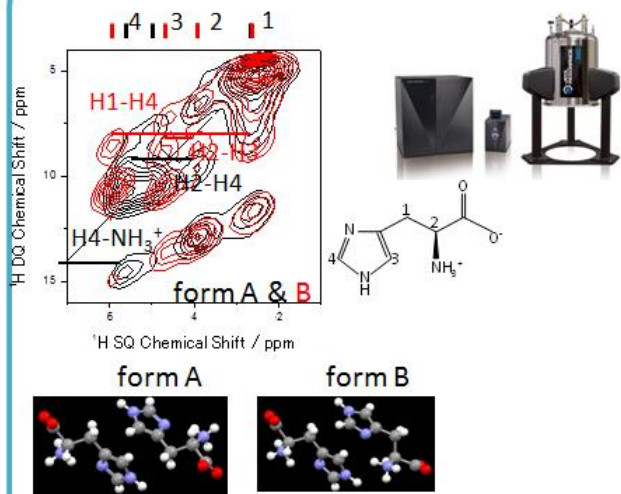
Difficult to distinguish in case of mixture.

JEOL's philosophy for open innovation!
Here we combine solid-state NMR and TEM.

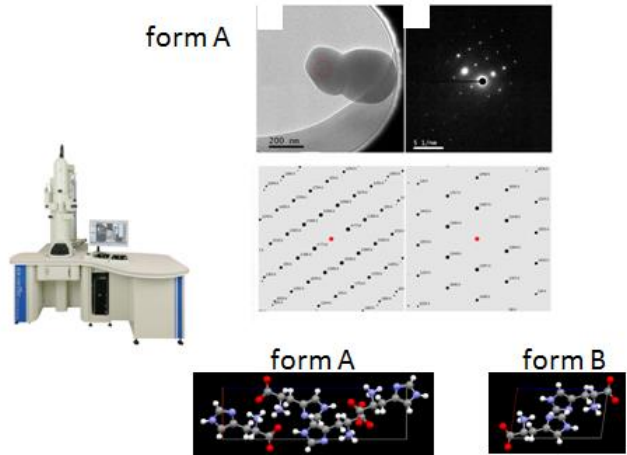
¹H correlation at very fast MAS

Our answer: Yokogushi

Electron diffraction



**Different molecular packing
(intermolecular ¹H-¹H correlation)**



Different lattice parameters with micro-crystals

Yes, we can!

Reference

Oikawa, T., Okumura, M., Kimura, T. & Nishiyama, Acta Cryst. C73 (2017) 219–228.