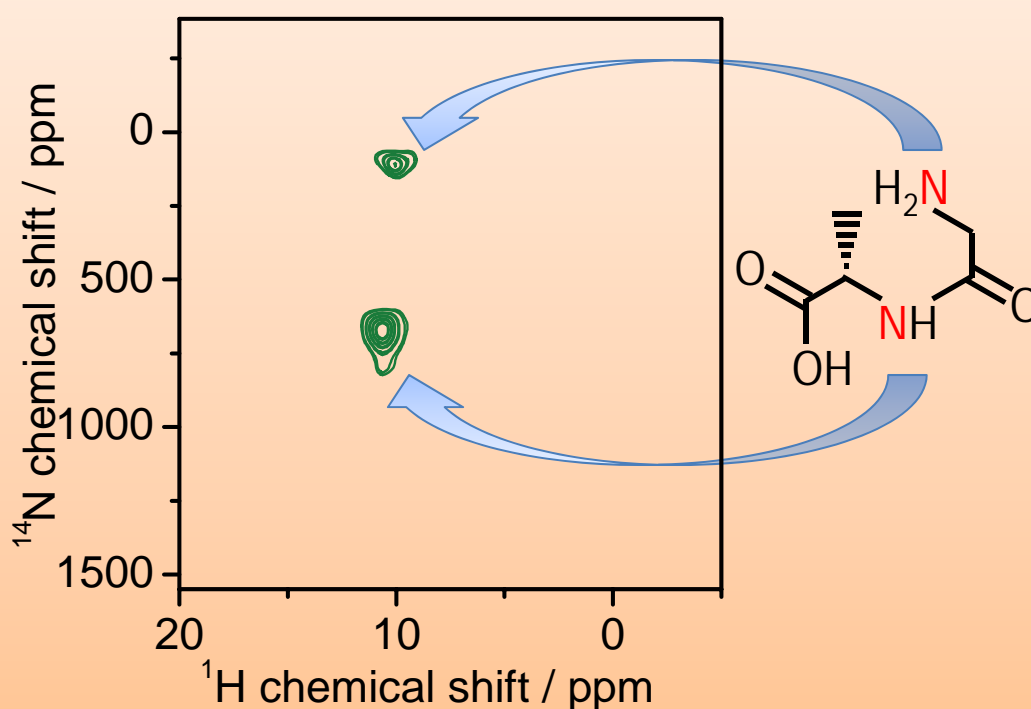


## A new field of solid-state NMR by very fast MAS: sub-micro-litter sample $^{14}\text{N}$ NMR collection in a few minutes

Rapid observations of  $^{14}\text{N}$  NMR for sub-micro-litter samples are presented.  $^{14}\text{N}$  is rarely observed by NMR despite its high natural abundance (99.6%) and its importance in bio and material sciences. The difficulties in observing  $^{14}\text{N}$  resonances are due to its integer spin quantum number ( $I=1$ ) and quadrupolar interactions. Because of these difficulties  $^{15}\text{N}$  NMR with expensive  $^{15}\text{N}$  isotopic-labeling is usually applied. Very fast MAS by 1 mm MAS system, which we recently developed, realizes quick observation of  $^{14}\text{N}$  NMR resonances of sub-micro liter samples within a few minutes, combining  $^1\text{H}$ - $^{14}\text{N}$  solid-state HMQC methods. The  $^1\text{H}$ - $^{14}\text{N}$  D-HMQC of dipeptide (glycyl-L-alanine) of 0.8  $\mu\text{L}$  gives clearly separated peaks of two distinct nitrogens. Slightly different  $^1\text{H}$  shifts for each peak can also be obtained. No isotopic labeling methods are applied to the sample.



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J. Magn. Reson. in press.



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