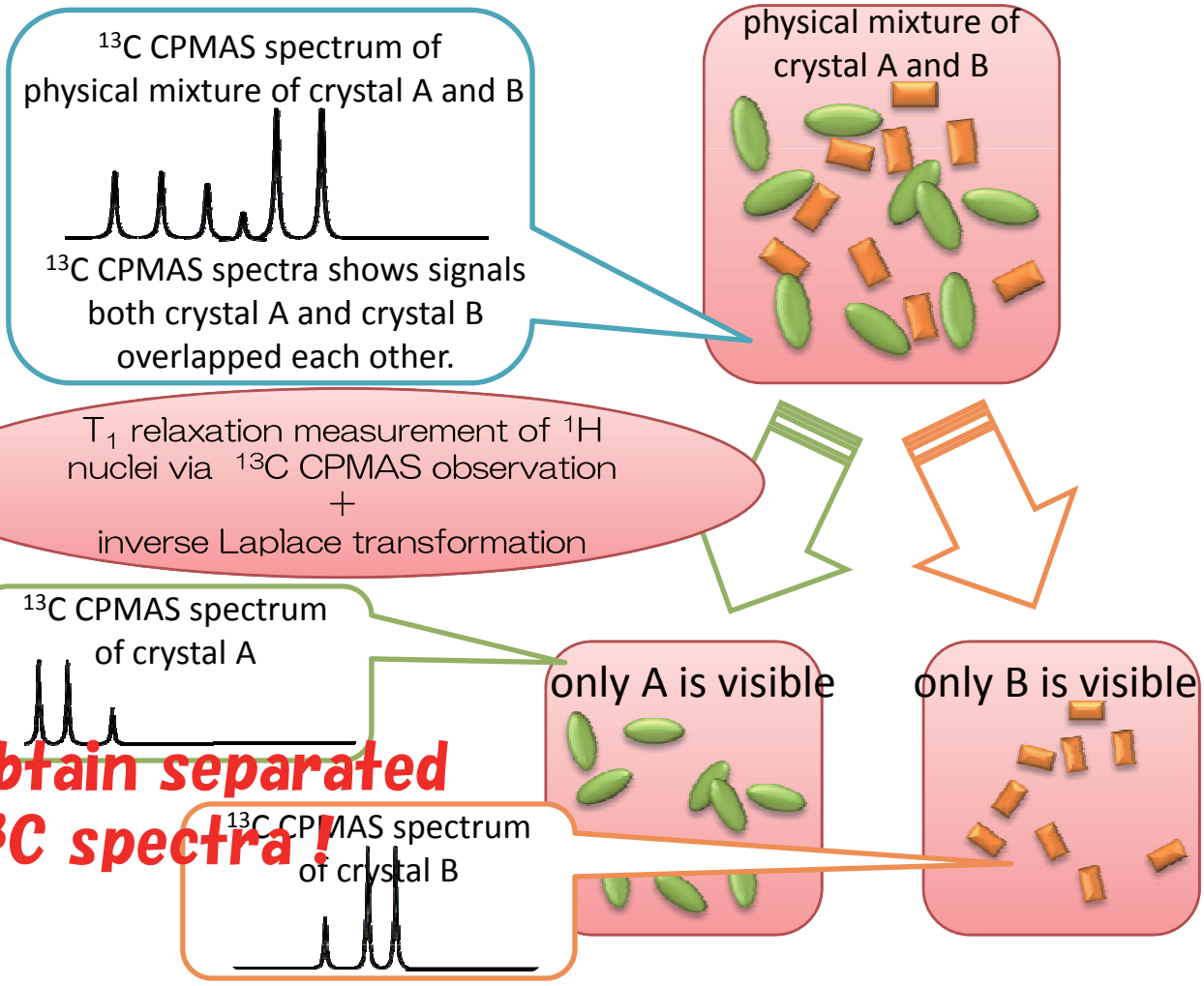
ROSY: The answer to mixture analysis in solid state NMR

The ROSY method facilitates easier and faster analysis of samples mixed with more than two components (crystals).

Mixture analysis by ROSY(Relaxation Ordered SpectroscopY) method

Due to the fast spin-diffusion among ^{1}H spins, the longitudinal relaxation time (T_1) of ^{1}H spins is governed by the fast relaxing fractions and is uniform within each crystal. Thus we can separate ^{13}C CPMAS spectra of each crystal by sorting spectra of the mixture into order of ^{1}H T_1 time. The procedure is numerically done by inverse Laplace transformation.



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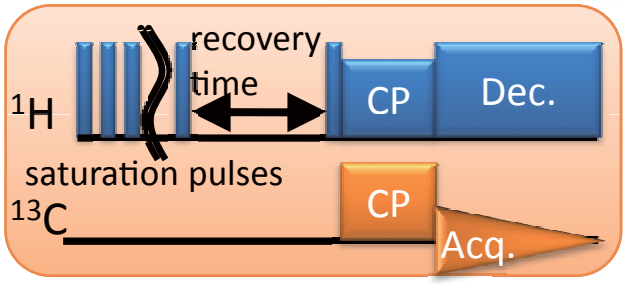
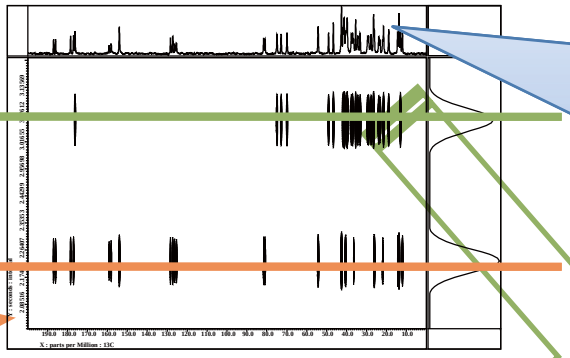
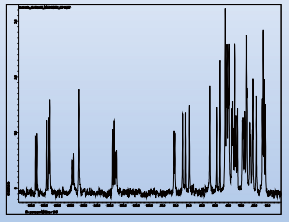
Experiments and processes



+ inverse Laplace transformation

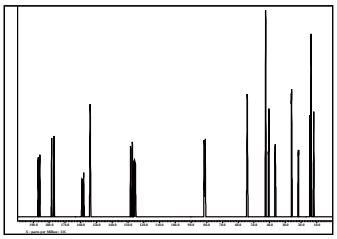
Results: the mixture of santonin and cholic acid

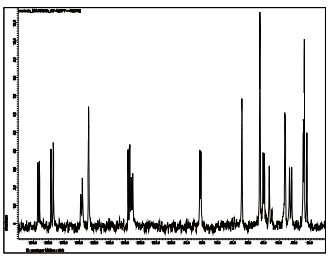




^{13}C CPMAS spectrum shows overlapped signals of santonin and cholid acid.

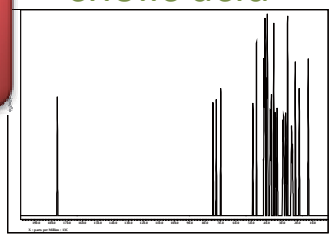
santonin

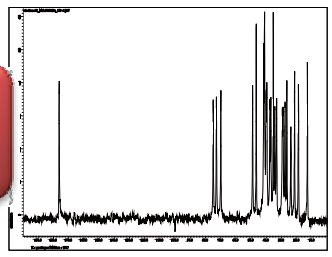




slices of ROSY spectrum of the mixture

cholic acid





CPMAS spectra of pure materials for each sample

ROSY method provides a separate ^{13}C CPMAS spectra from the mixture

※Inverse Laplace Transforms for ROSY will be available in Delta V 5.0.

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