



HAL
open science

Mesostructured silica studied by silicon filtered reverse cross-polarization solid state NMR

Guillaume Laurent, Niki Baccile, Jocelyne Maquet, Christian Bonhomme,
Florence Babonneau

► **To cite this version:**

Guillaume Laurent, Niki Baccile, Jocelyne Maquet, Christian Bonhomme, Florence Babonneau. Mesostructured silica studied by silicon filtered reverse cross-polarization solid state NMR. International school on high-field NMR spectroscopy for solids and liquids, May 2006, Les Houches, France. hal-01881960

HAL Id: hal-01881960

<https://hal.sorbonne-universite.fr/hal-01881960>

Submitted on 26 Sep 2018

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Mesostuctured silica studied by silicon filtered reverse cross-polarization solid state NMR

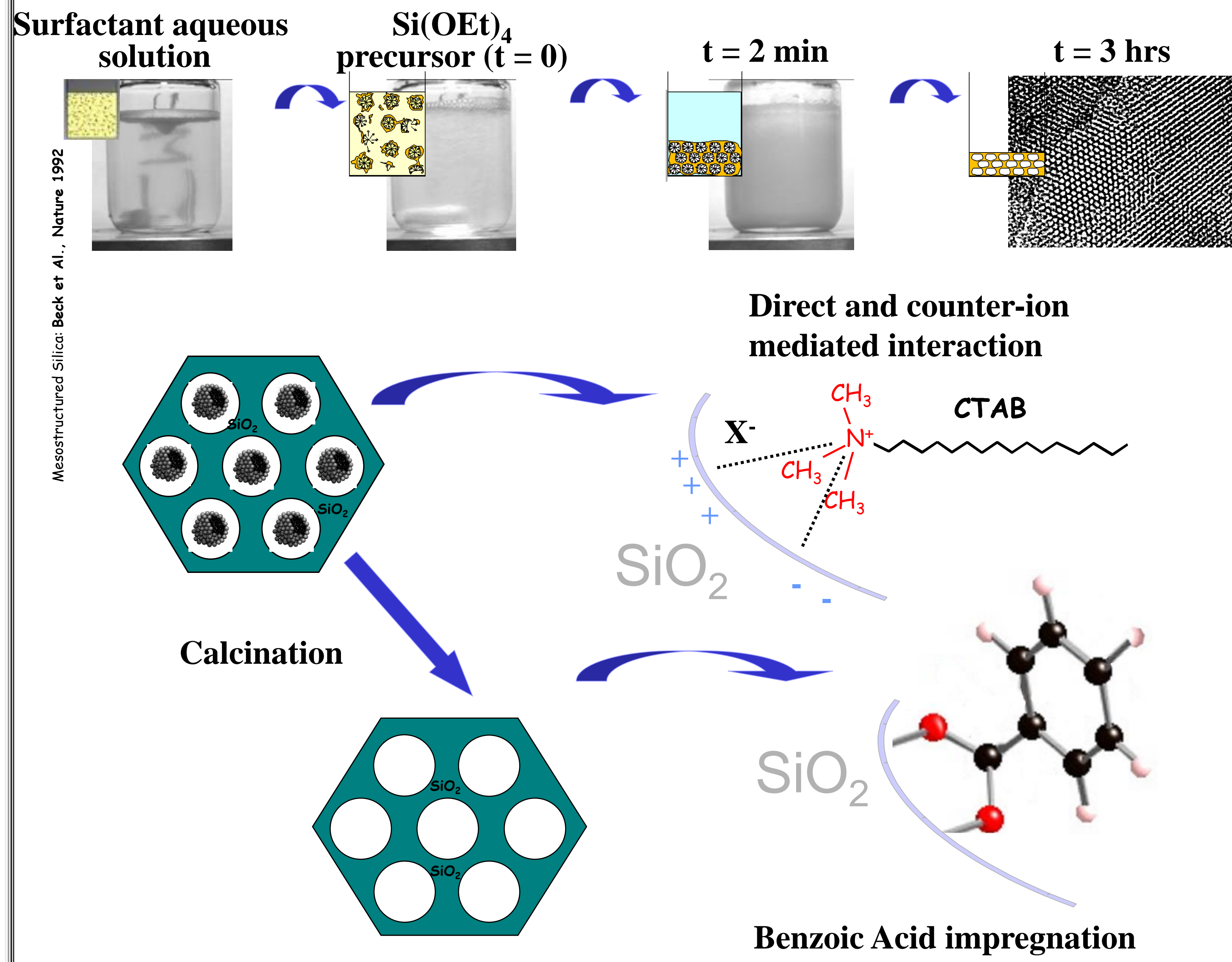
Guillaume LAURENT, Niki BACCILE, Jocelyne MAQUET, Christian BONHOMME and Florence BABONNEAU

Laboratoire de Chimie de la Matière Condensée de Paris, CNRS-UMR-7574, Université Pierre et Marie Curie, Paris



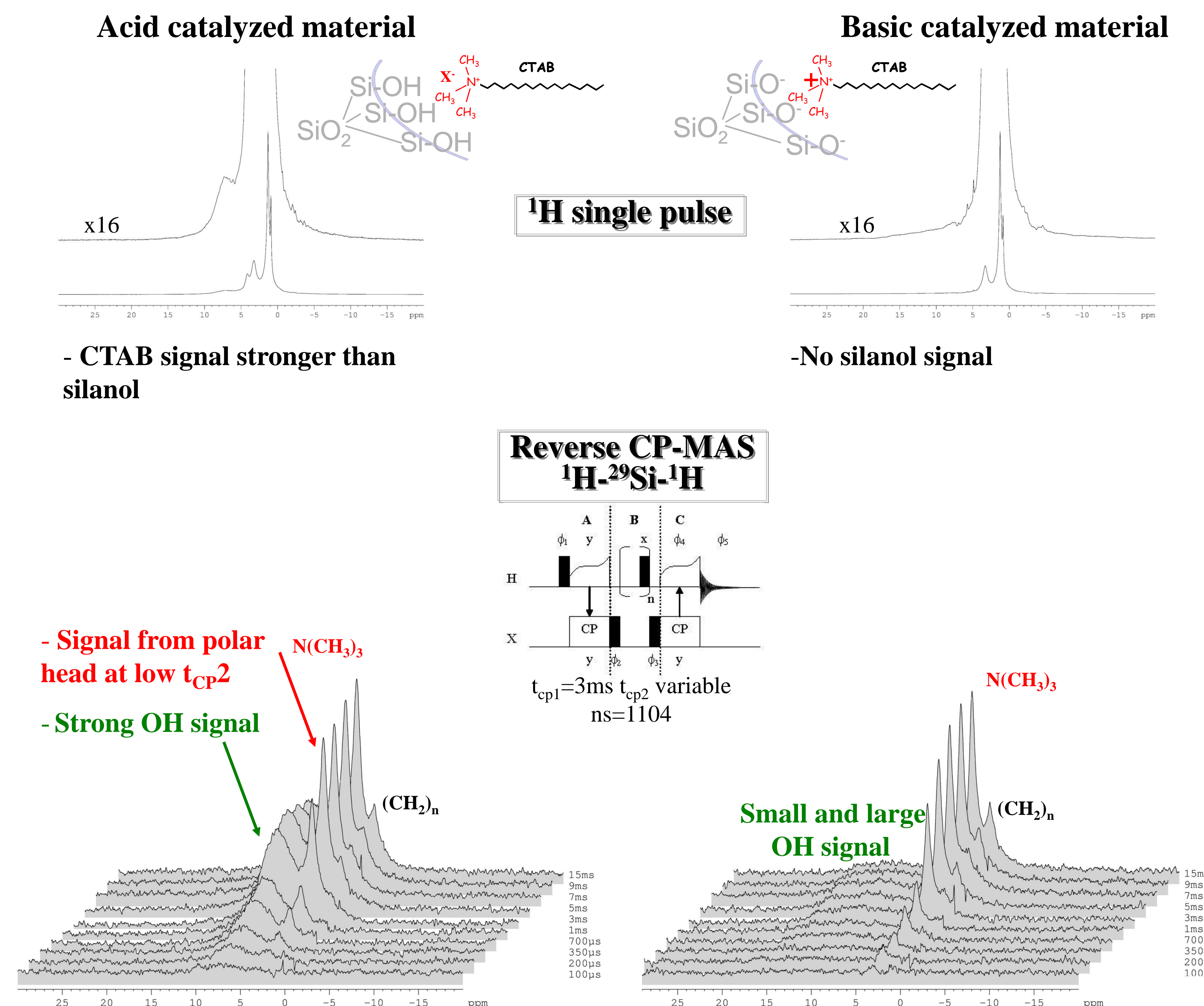
Nano-organised silica powders, prepared from self-assembly of surfactants and siliceous species, have done their breakthrough in the early '90s and, ever since, the interest of the material's community is growing continuously because of the extreme versatility of the process and the important number of possible applications achievable. Despite numerous contributions to the subject, some basic information concerning interactions at organic/inorganic interface has not been clarified yet. This poster will try to show how some advanced solid state NMR experiences can contribute to give more insights to some structural problems at the silica/surfactant interface and host-guest interactions between silica and embedded molecules.

Introduction



CTA⁺ – SiO₂ interactions

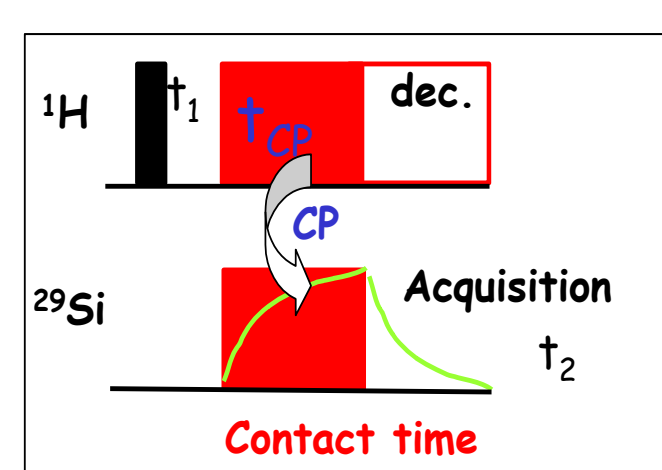
$B_0 = 7.04 \text{ T}$; MAS = 14 kHz



CTA⁺ is further away from surface in acid-based materials

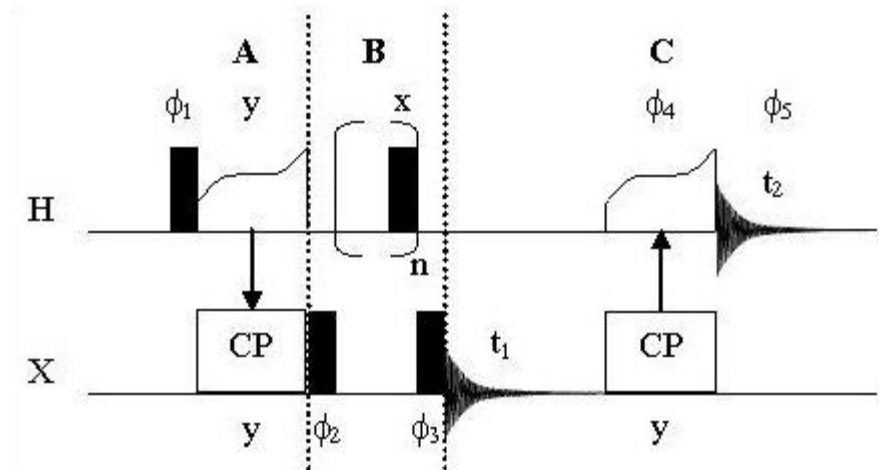
2D heteronuclear correlation

Normal hetcor ^1H - ^{29}Si

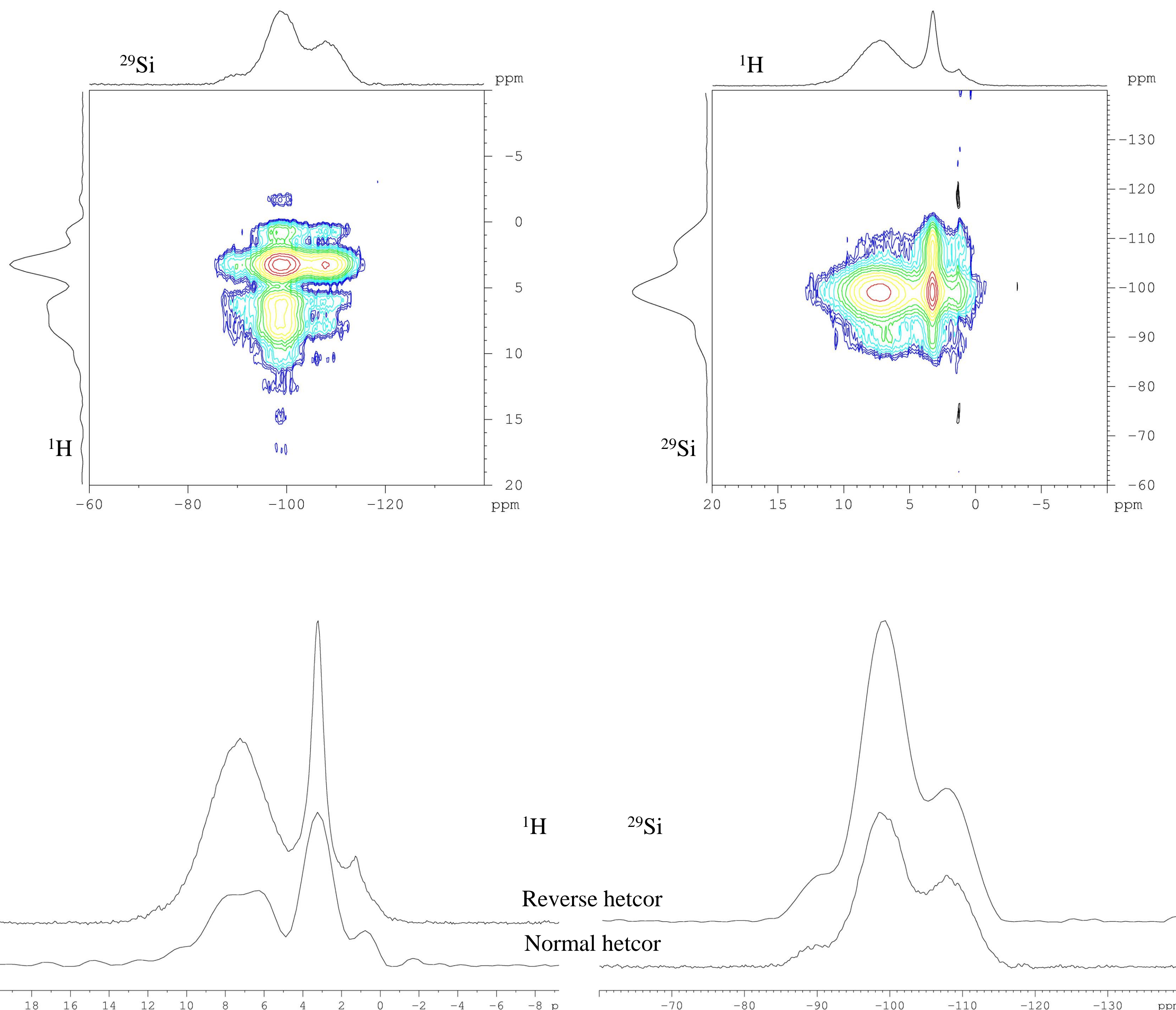


ns=800, $td_1=64$, $si_1=256$, $t_{cp}=3\text{ms}$, $B_0=9.4\text{T}$

Reverse hetcor ^1H - ^{29}Si - ^1H

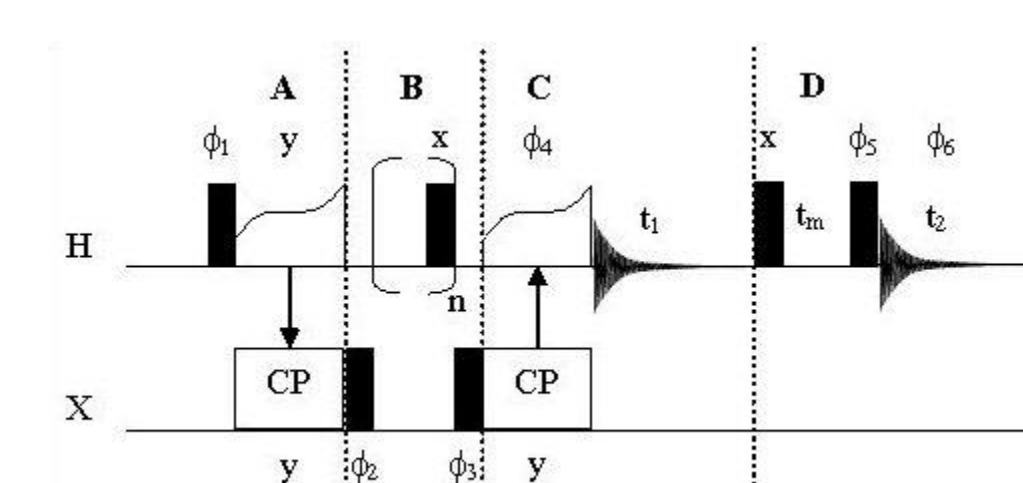


ns=800, $td_1=59$, $si_1=256$, $t_{cp1}=t_{cp2}=3\text{ms}$, $B_0=9.4\text{T}$



- Signal enhancement
- Resolution enhancement

2D silicon filtered noesy



$td_1=128$, $si_1=256$, $t_{cp1}=3\text{ms}$, $t_{cp2}=5\text{ms}$, $B_0=7.04\text{T}$

