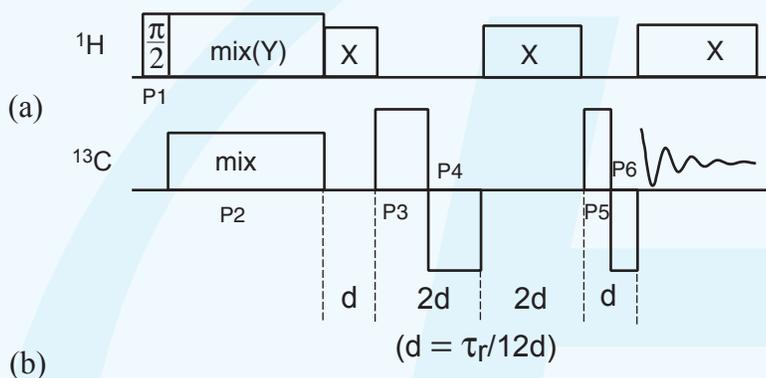


1. Introduction

The pulse sequence, SELTICS (Sideband Elimination by Temporary Interruption of Chemical Shift), has the effect of suppressing rotational sidebands in magic-angle spinning spectra.<sup>1</sup> The SELTICS sequence consists of pairs of *rf* pulses of equal intensities and opposite phases. The lengths of the pulses are certain fractions of the rotor cycle. Here we demonstrate N = 6 SELTICS sequence incorporated with cross-polarization (CP) excitation in acquiring <sup>13</sup>C spectra of hexamethylbenzene and tyrosine hydrochloride on Tecmag spectrometers.

2. Pulse sequence



1D phase tables:

P1=ph\_H90: 0, 0, 0, 0, 2, 2, 2, 2  
 P2 = ph\_Cmix: 0, 1, 2, 3, 2, 3, 0, 1  
 ph\_rx: [0, 1, 2, 3  
 P3 & P5 = ph\_csl1: (0)<sub>4</sub>, (2)<sub>4</sub>, (1)<sub>4</sub>, (3)<sub>4</sub>  
 P4 & P6 = ph\_csl2: (2)<sub>4</sub>, (0)<sub>4</sub>, (3)<sub>4</sub>, (1)<sub>4</sub>

Event Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Name:	phst	unblk	H90	contact	Hdcp1	Cspinlock+	Cspinlock-	Hdcp2	Cspinlock+	Cspinlock-	ringdown	turnon	acq	relax
Delay	1u	1u	H90	mix	Hdcp1	Cspinlock1	Cspinlock1	Hdcp2	Cspinlock2	Cspinlock2	rd	ad	Acq. Time	Last Delay
F1_Ampl		H90 amp	H90 amp	Hmix amp	Hdec amp	Hdec amp	Hdec amp	Hdec amp	Hdec amp	Hdec amp	Hdec amp	Hdec amp	Hdec amp	
F1_PhMod														
F1_Ph		ph_H90	ph_H90	Y										
F1_Atten		H90 attn	H90 attn	Hmix attn	Hdec attn	Hdec attn	Hdec attn	Hdec attn	Hdec attn	Hdec attn	Hdec attn	Hdec attn	Hdec attn	
F1_TxGate														
F1_PhRst														
F1_UnBlank														
Acq														
Acq_phase														ph_rx
RX_Blank														
RX_PhRst														
F2_Ampl			Cmix amp	Cmix amp	Csl amp	Csl amp	Csl amp	Csl amp	Csl amp	Csl amp				
F2_PhMod														
F2_Ph			ph_Cmix	ph_Cmix		phcs1	phcs2		phcs1	phcs2				
F2_Atten			Cmix attn	Cmix attn	Csl attn	Csl attn	Csl attn	Csl attn	Csl attn	Csl attn				
F2_TxGate														
F2_PhRst														
F2_UnBlank														

Acquisition	Frequency	Multi Rec.	Processing	Grad. Preemph.	Misc.	Sequence
H90		4u	rd	5u	Hdec amp	85
mix		3m	ad	5u	H90 attn	12
Hdcp1	=1000000/[rotorspeed]/12		Acq. Time	20.48m	Hmix attn	13
Cspinlo...	=1000000/[rotorspeed]/12		Last Delay	5s	Hdec attn	13
Hdcp2	=[Hdcp1]*2		H90 amp	80	Cmix amp	90
Cspinlo...	=[Cspinlock1]/2		Hmix amp	85	Csl amp	90
					Cmix attn	10
					Csl attn	8
					rotorspeed	3000u

Fig. 1. (a) The pulse sequence for the CP - SELTICS (N = 6) experiment. (b) The sequence in the NTNMR sequence editor.

### 3. Experiment (continued)

Sample: a. hexamethylbenzene (HMB), b. tyrosine hydrochloride  
 Spectrometer: 7 Tesla magnet with Tecmag HF3 Discovery  
 Probe: DOTY HF3 MAS probe  
 $^1\text{H}$  90° pulse: 4  $\mu\text{s}$   
 Mixing field: 62.5 kHz  
 $^1\text{H}$  decouple field: 45 kHz (HMB), 55 kHz (tyrosine)  
 $^{13}\text{C}$  spinlock field: 71.4 kHz  
 Dwell time (1D): 20  $\mu\text{s}$   
 Acq. points: 1024  
 recycle time: 3s (HMB), 5s (tyrosine)  
 Scans 1D: 64 (HMB), 256 (tyrosine)

### 4. Results

#### Data processing:

(1) In the NDFT window, click the "1D" tab and select: "Use 1D settings", "Fourier Transform", "Gaussian: 50,"

(2) Phase correction  
click Option|Phase Adjustment, adjust both Phase 0 and Phase 1.

(3) Baseline fix (only for tyrosine)  
click Option|Baseline fix, then click Calculate button, move the baseline points to proper positions and finally click Apply.

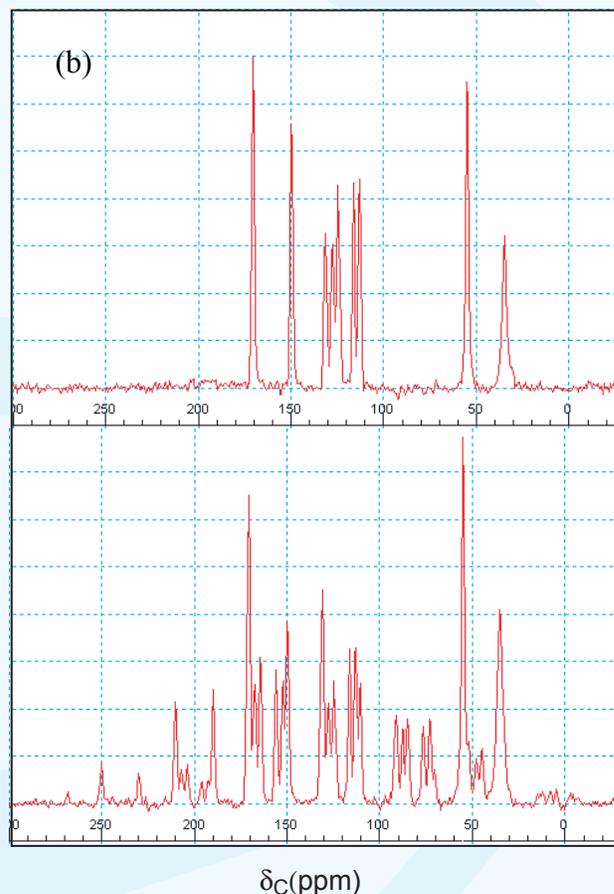
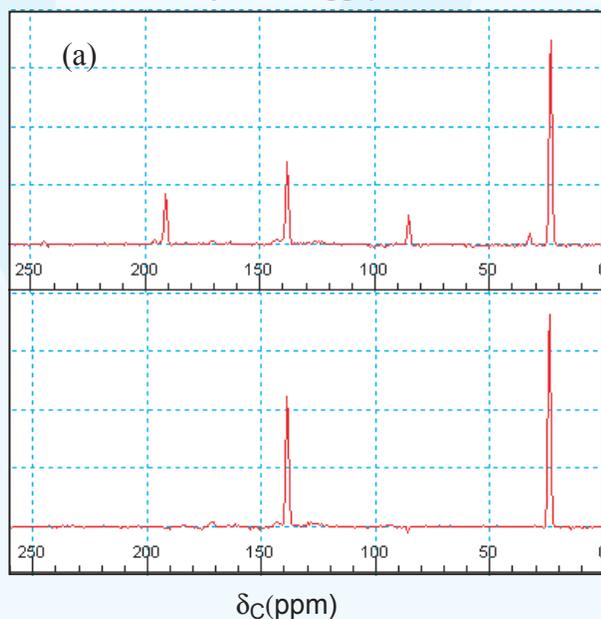


Fig. 2. The  $^{13}\text{C}$  CP spectra of HMB (a) and tyrosine hydrochloride (b) acquired with (top) and without (bottom) SELTICS sequence.

### 5. Reference

1. J. Hong, G. Harbison, *J. Magn. Reson., Series A*, 105, 1993, 128-136.