

SHARPER NMR

*Sensitive, Homogeneous And Resolved PEaks
in Real time*

Ariana Jones

Supervisors: Dusan Uhrin, Guy Lloyd-Jones

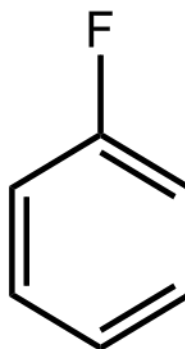
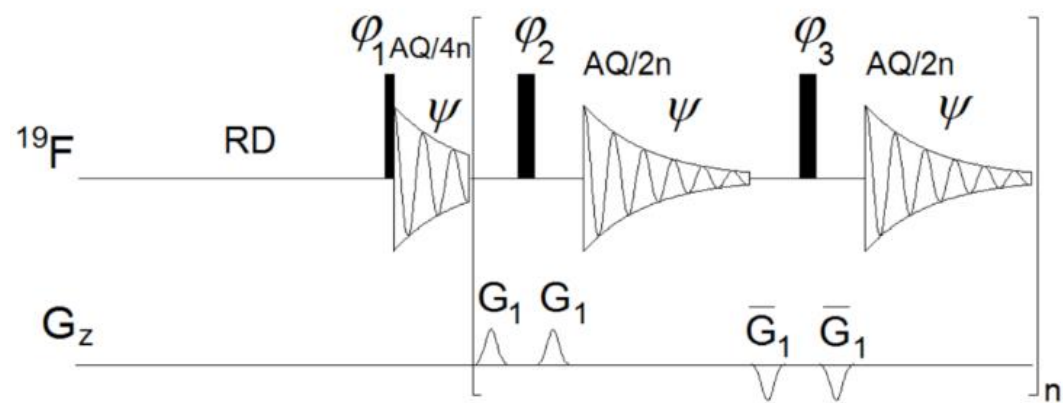
SNUG Firbush

31st August 2017

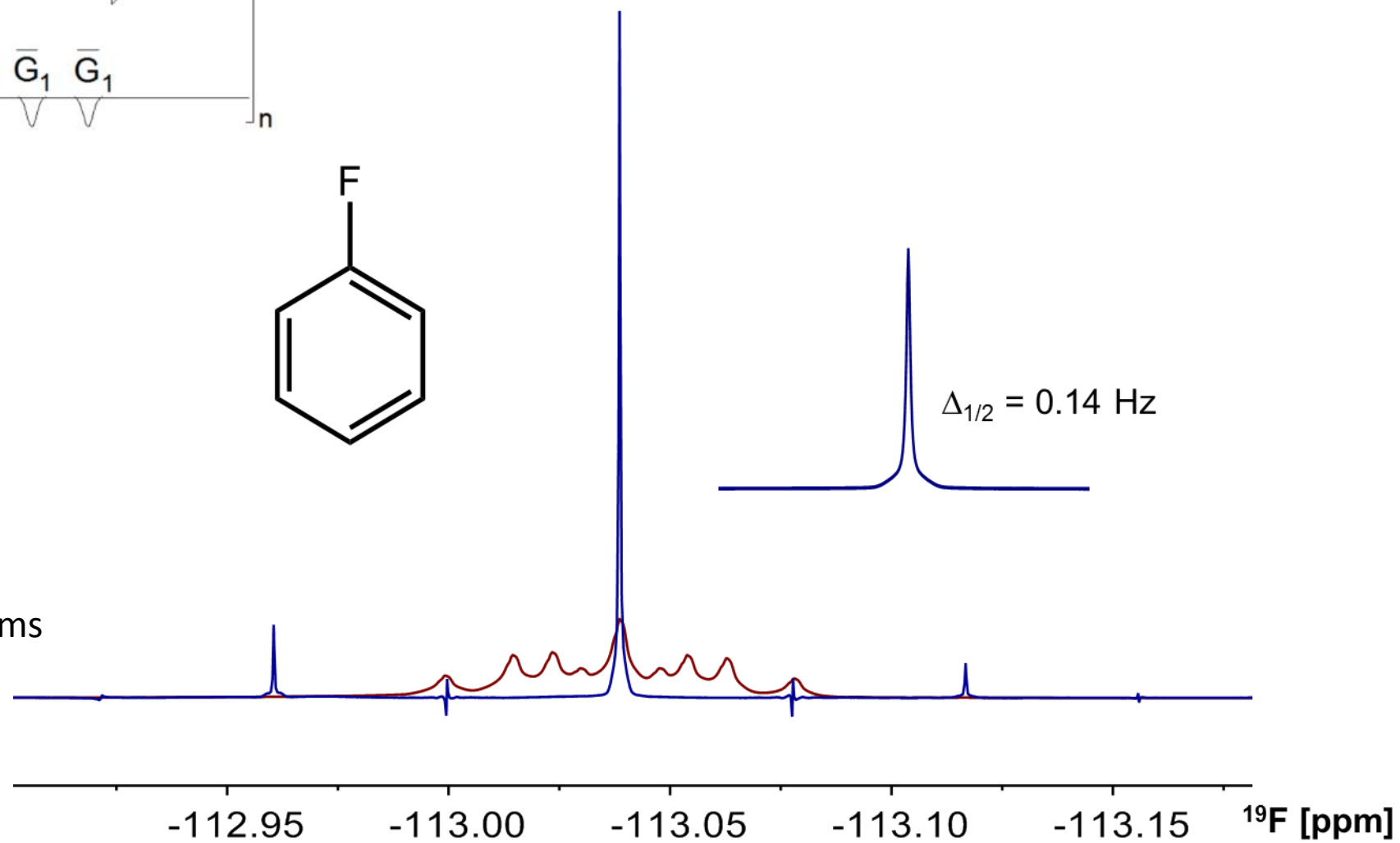


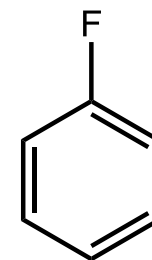
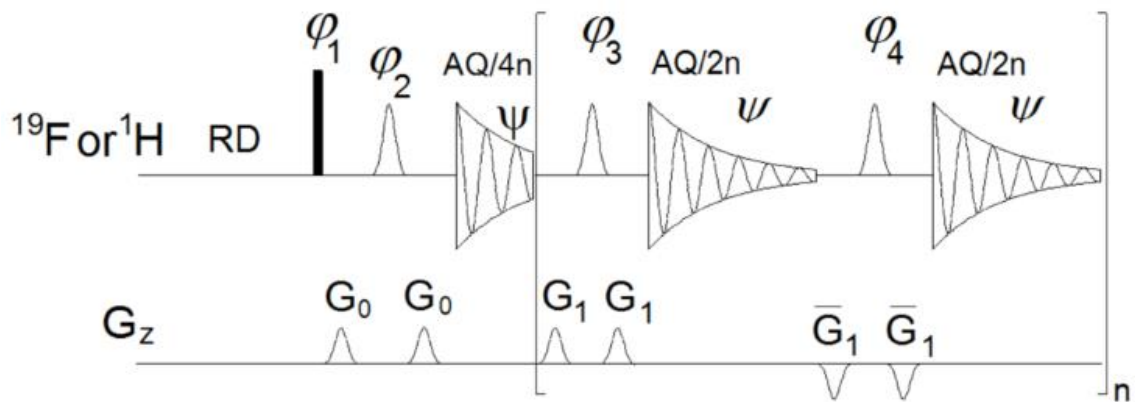
THE UNIVERSITY
of EDINBURGH

Sensitive

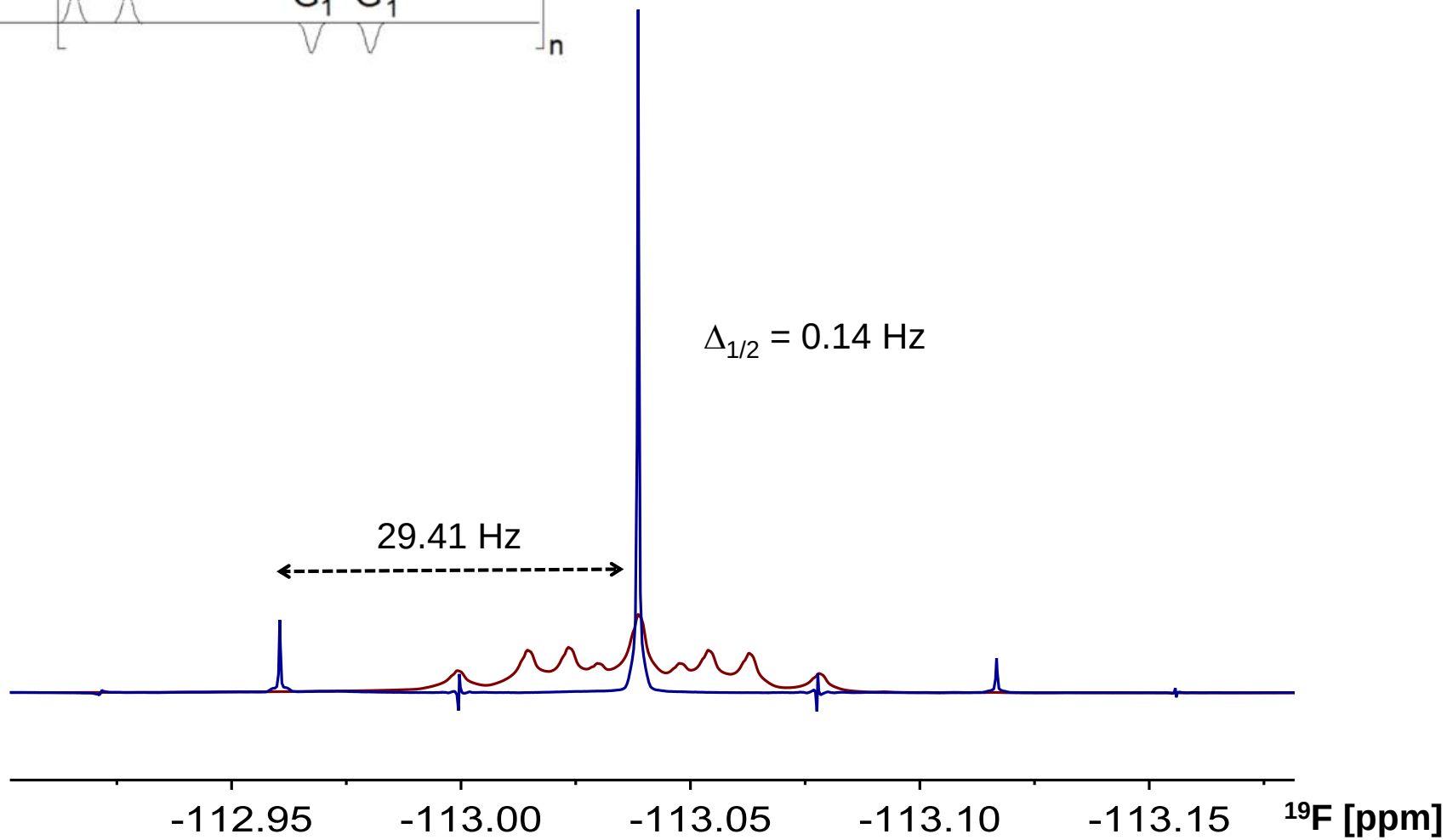


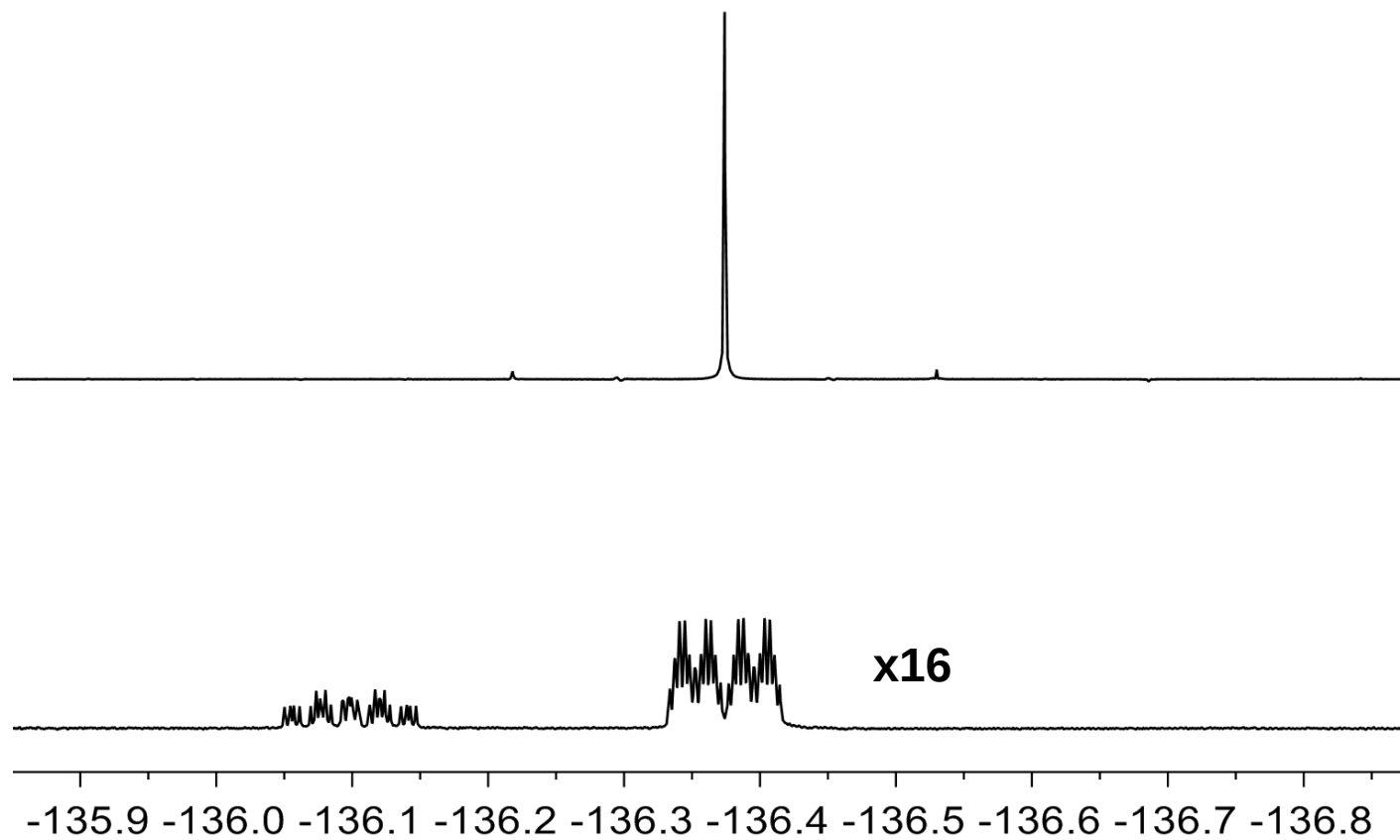
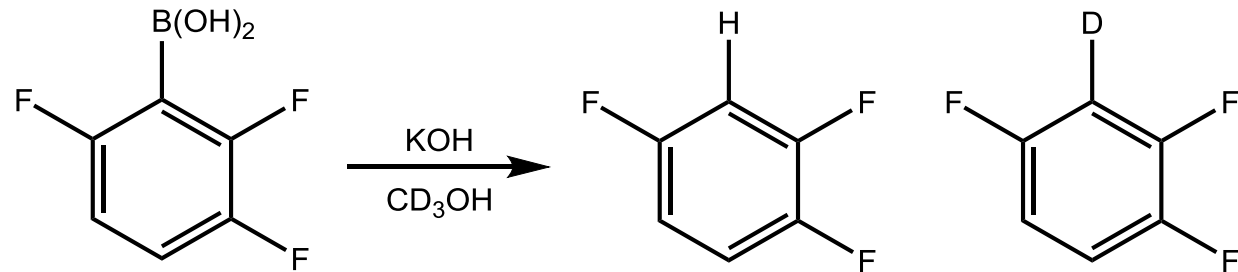
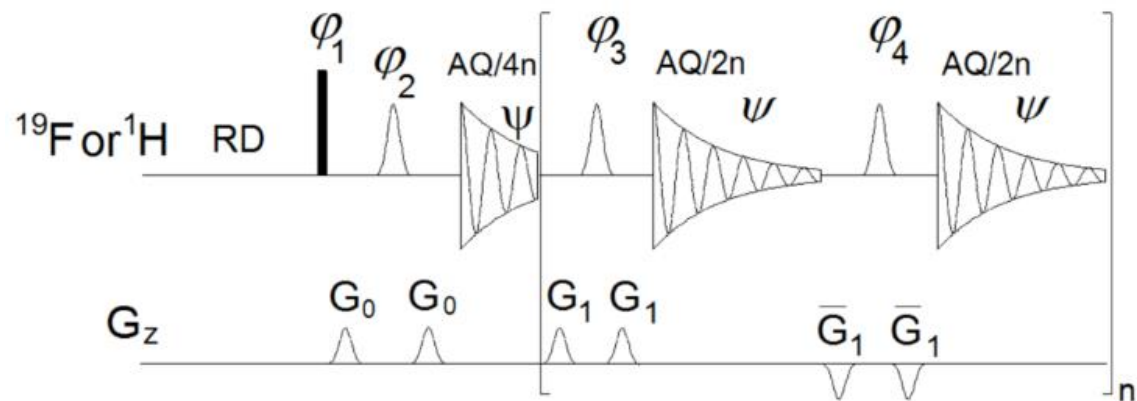
Chunk time = 34 ms

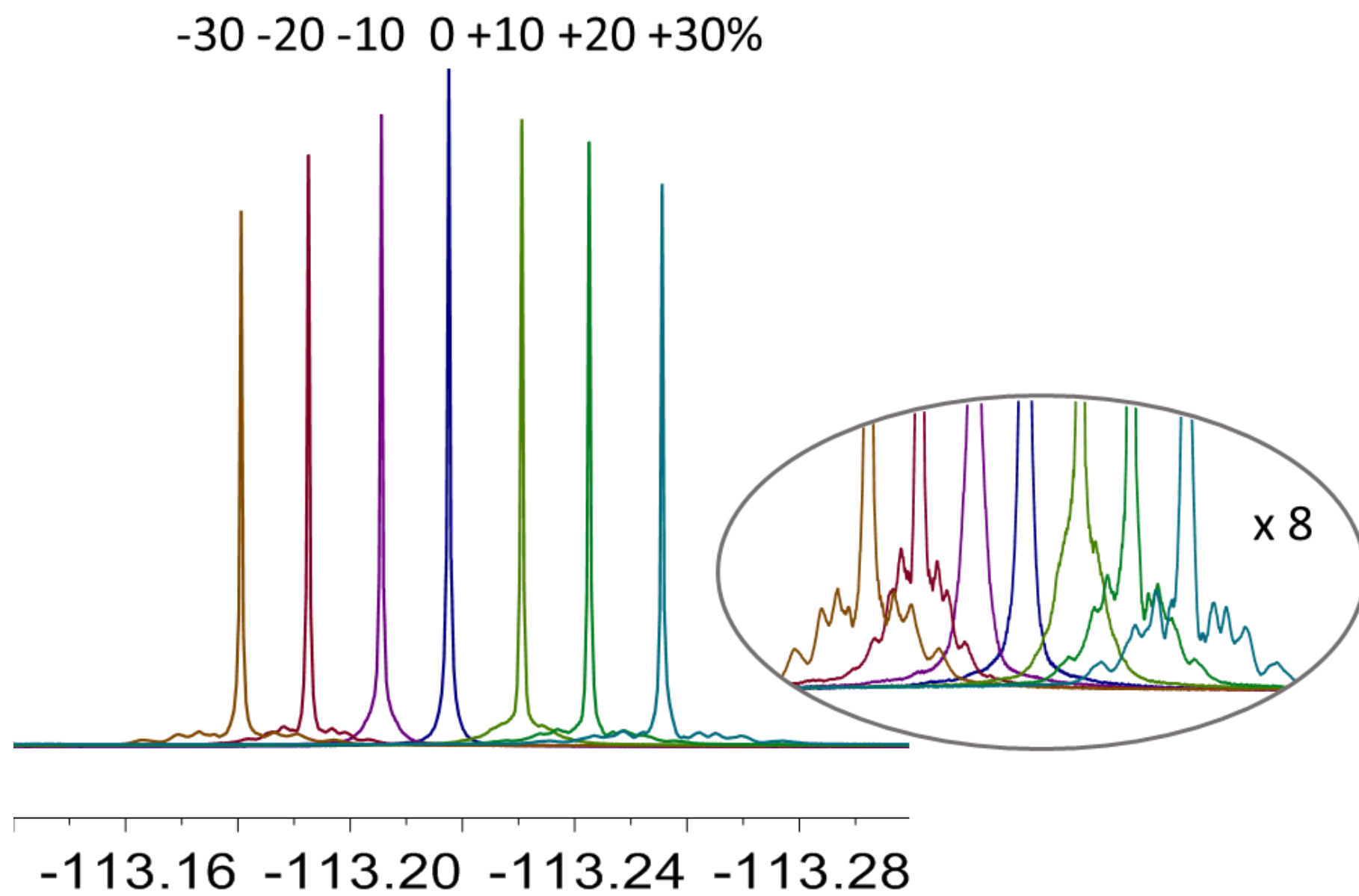




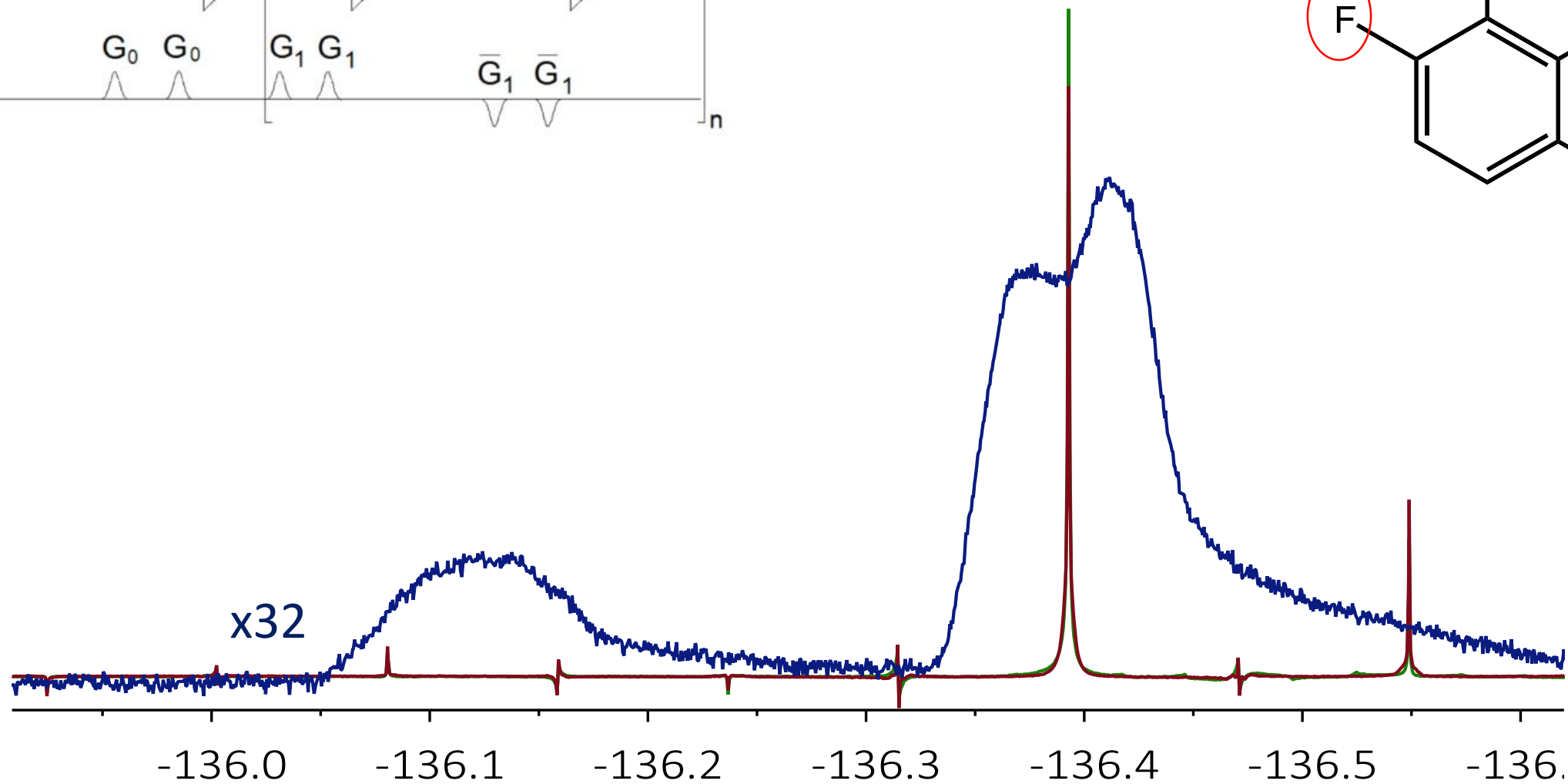
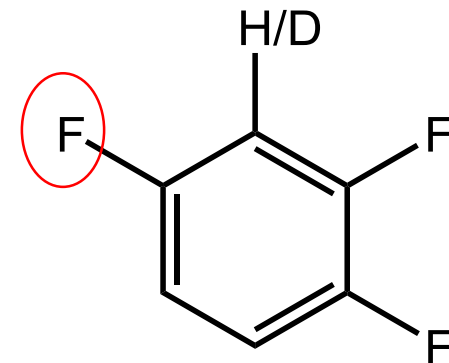
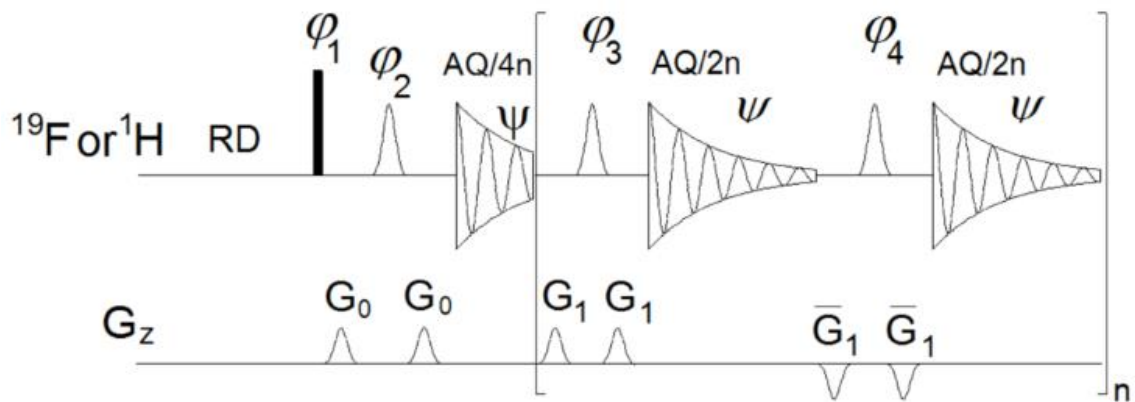
Chunk time = 34 ms
 $1/0.034 = 29.41$





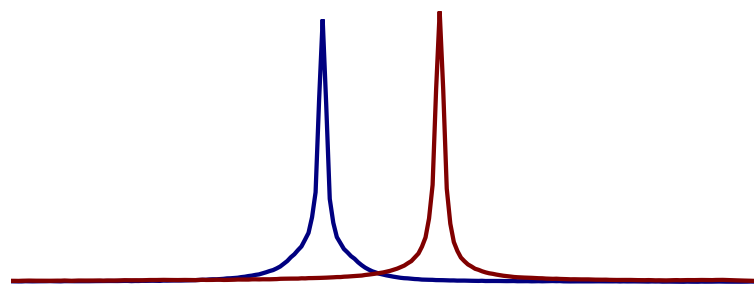


Homogeneous

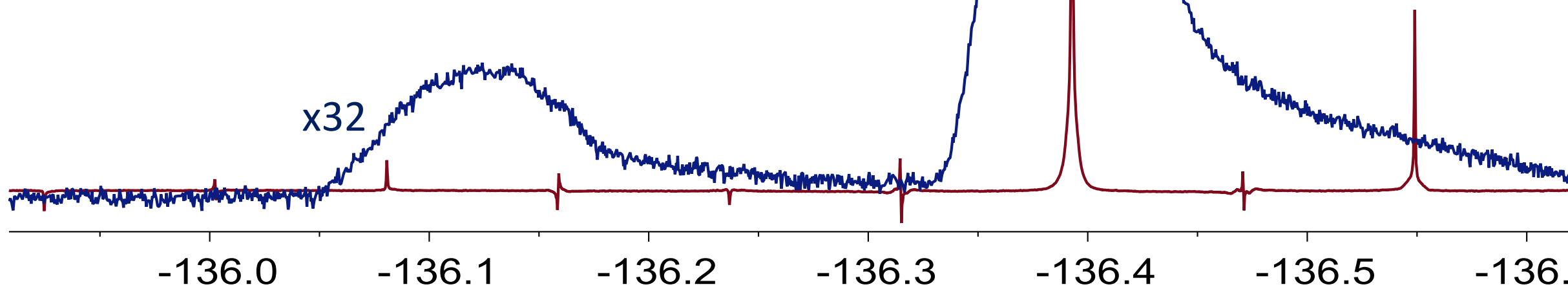
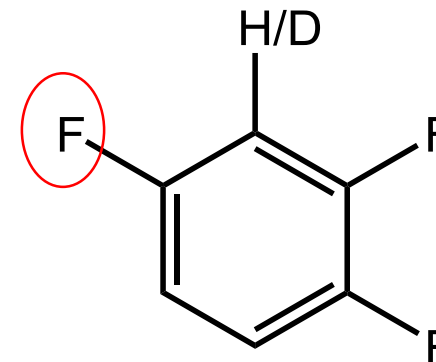


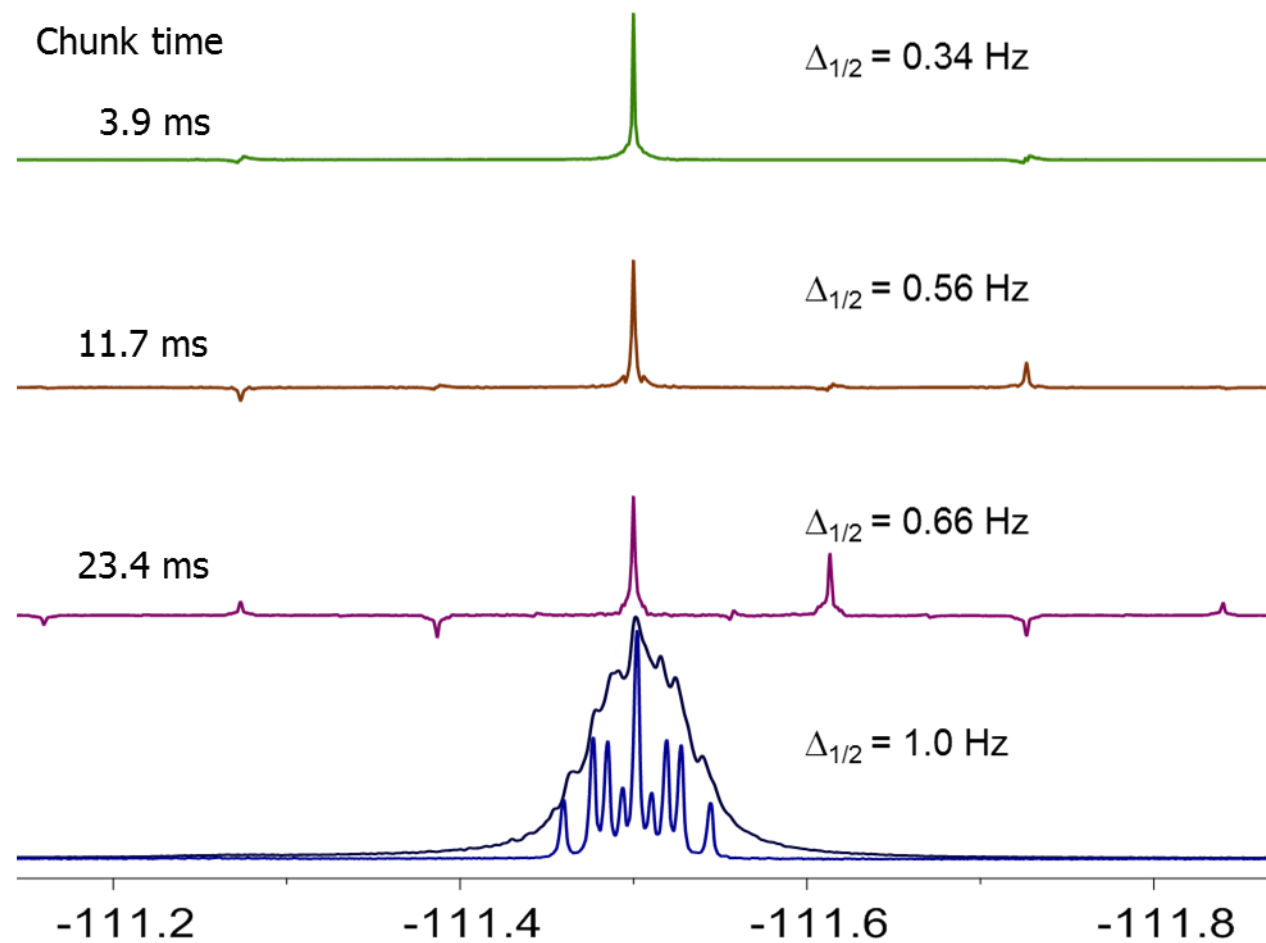
Integral [%]: 82 73

$\Delta_{1/2}$ [Hz]: 0.24 0.31

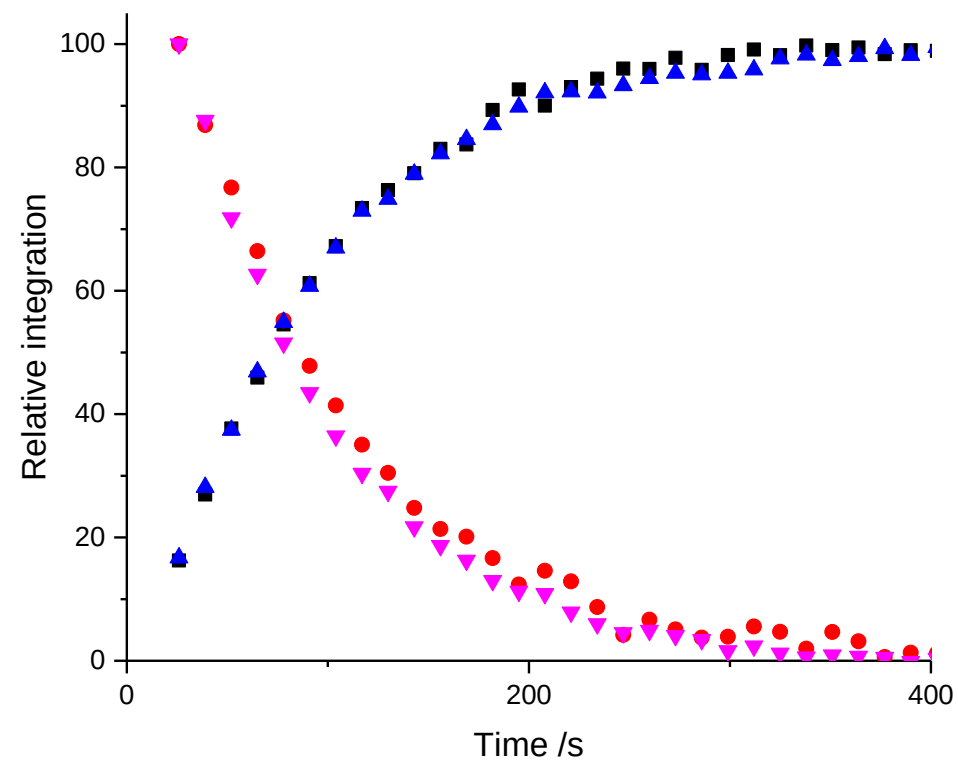
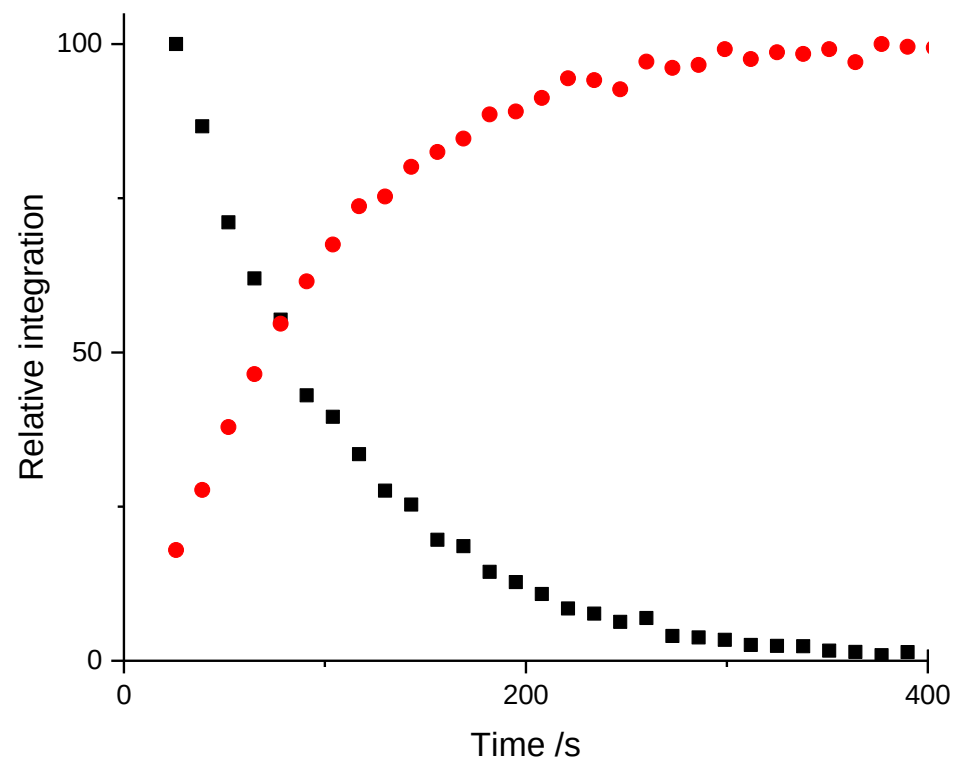
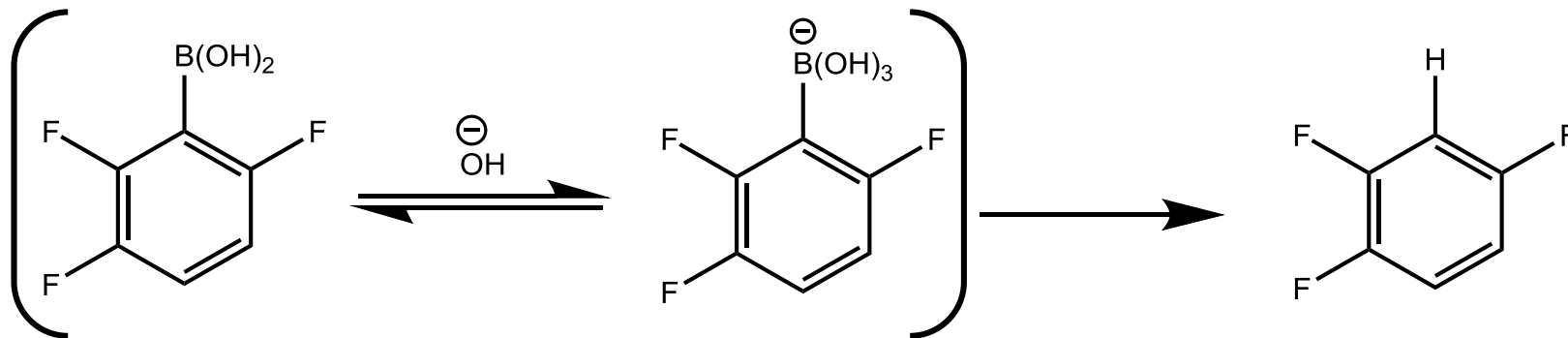


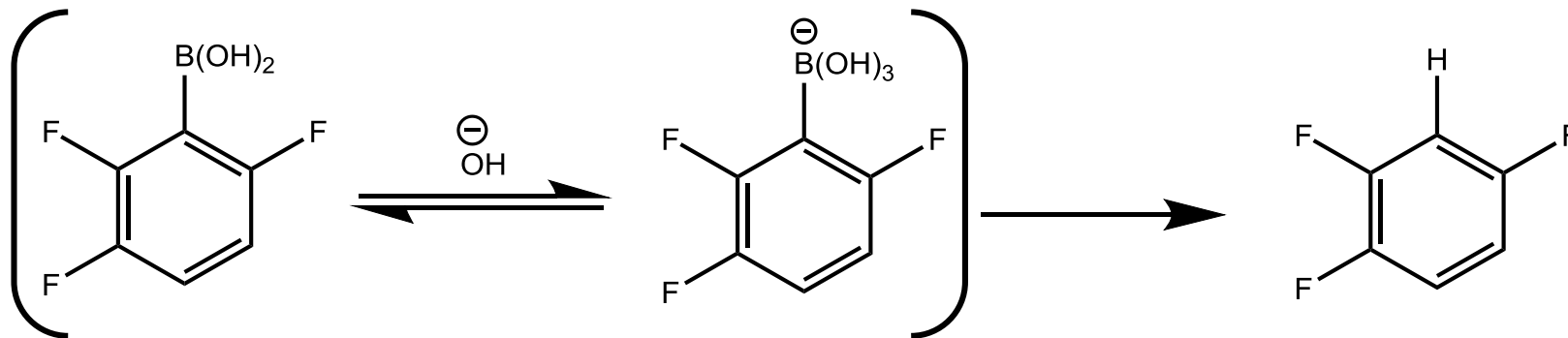
$\Delta_{1/2} = 35.6$ Hz



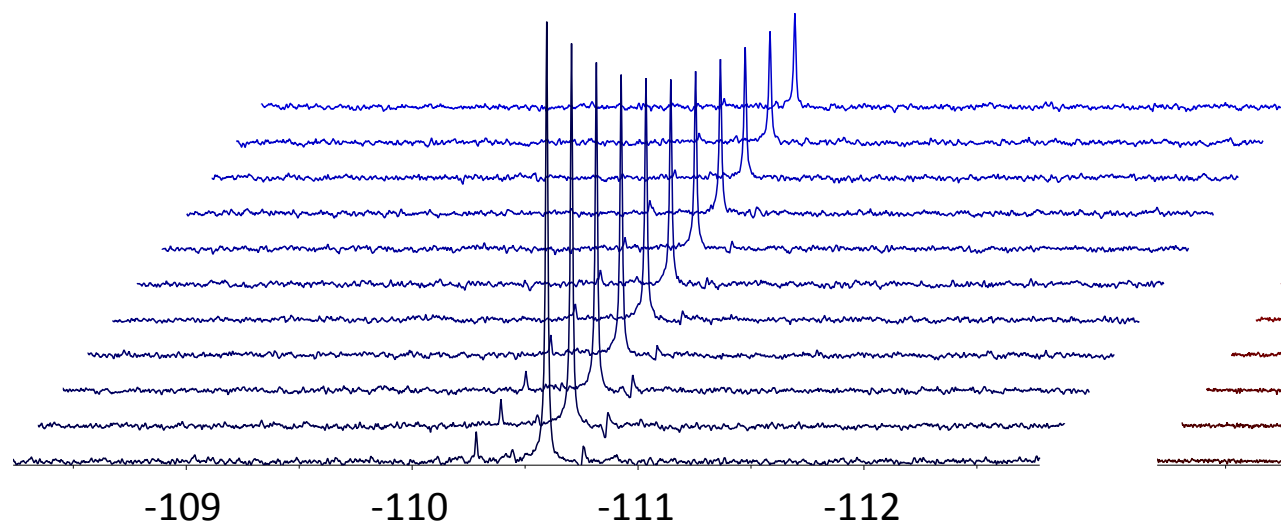


Resolved Peaks

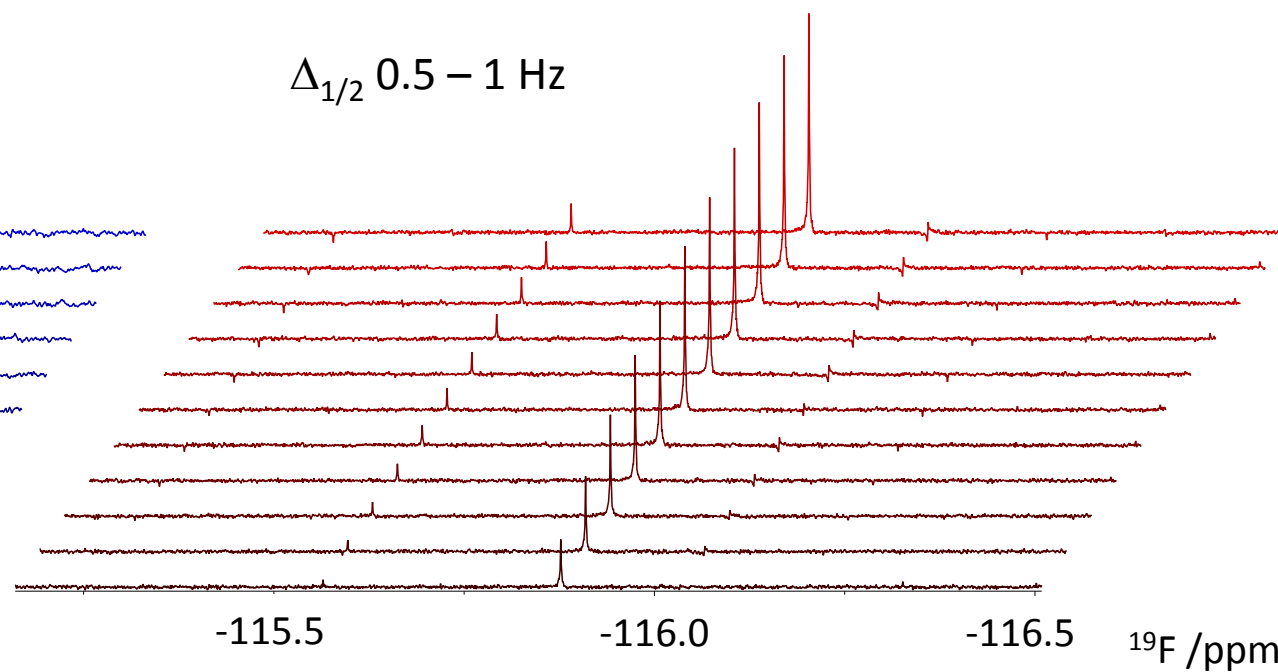


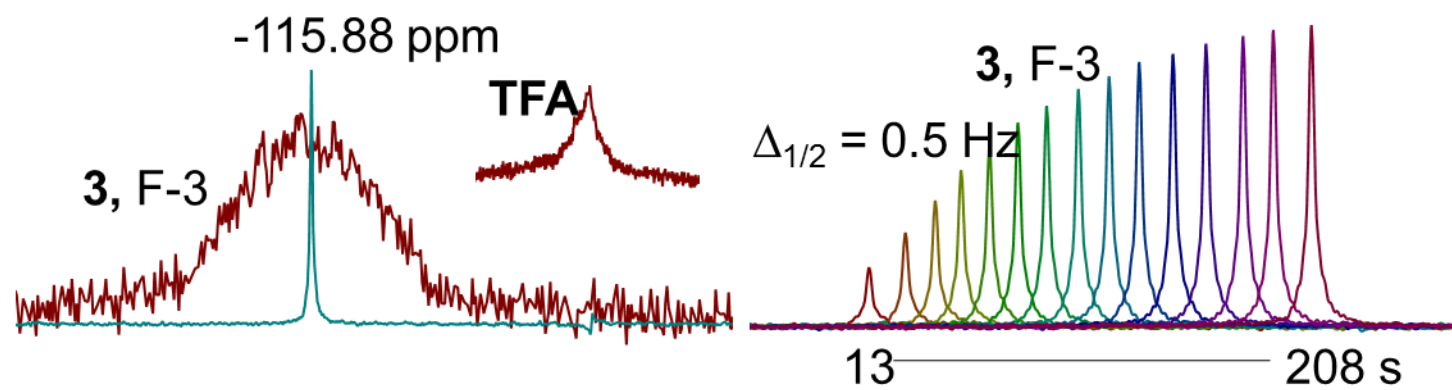
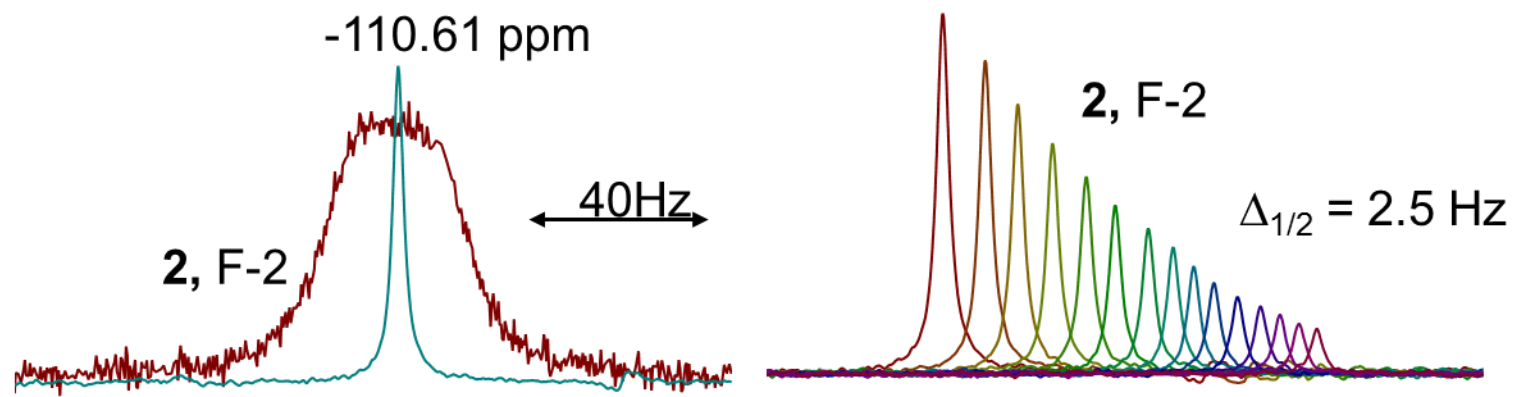
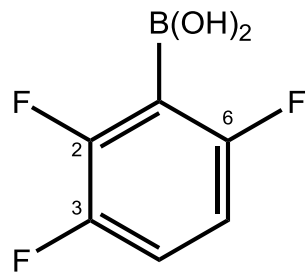


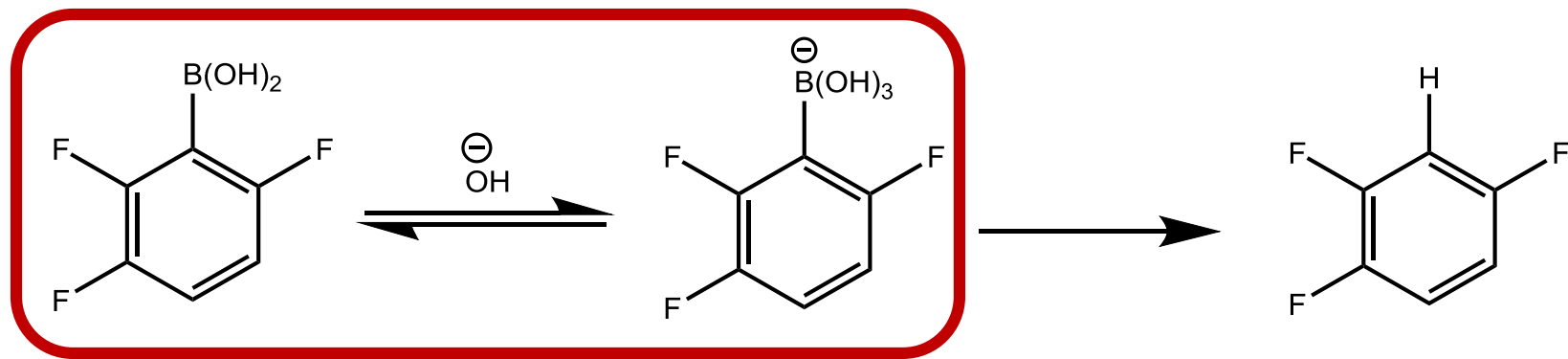
$\Delta_{1/2}$ 2 – 5 Hz



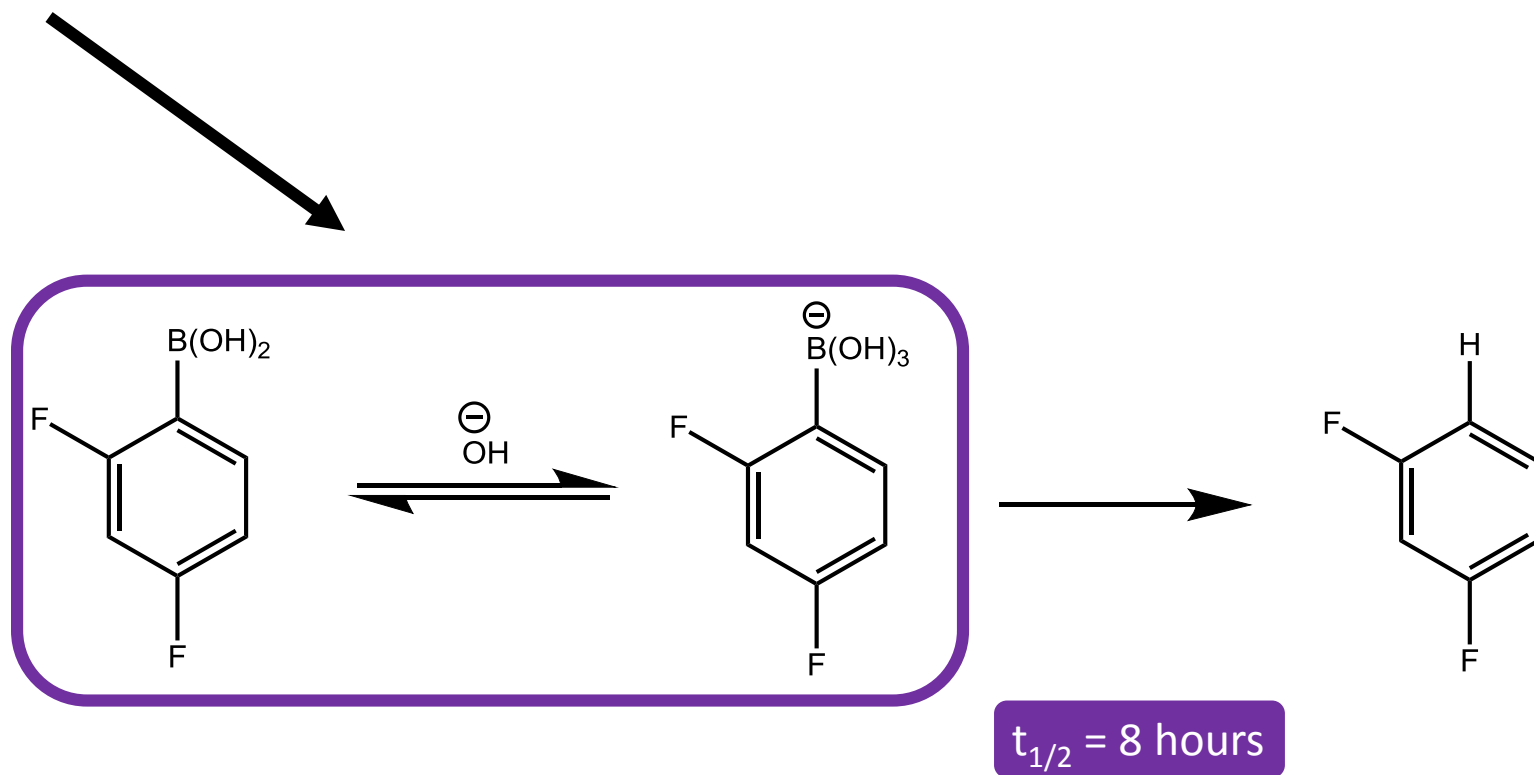
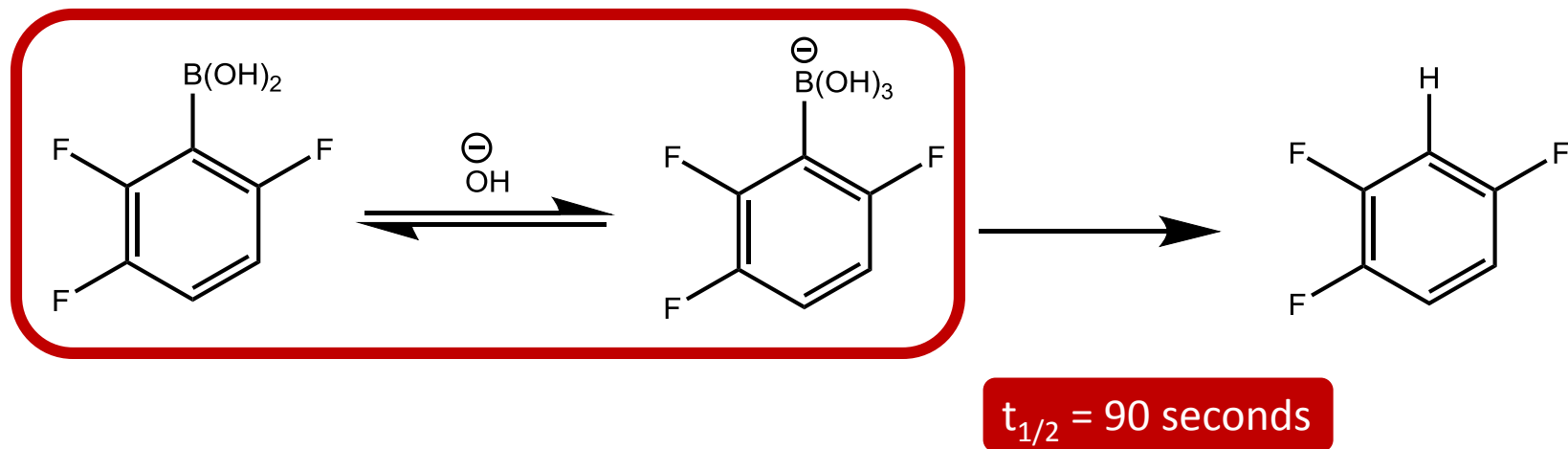
$\Delta_{1/2}$ 0.5 – 1 Hz

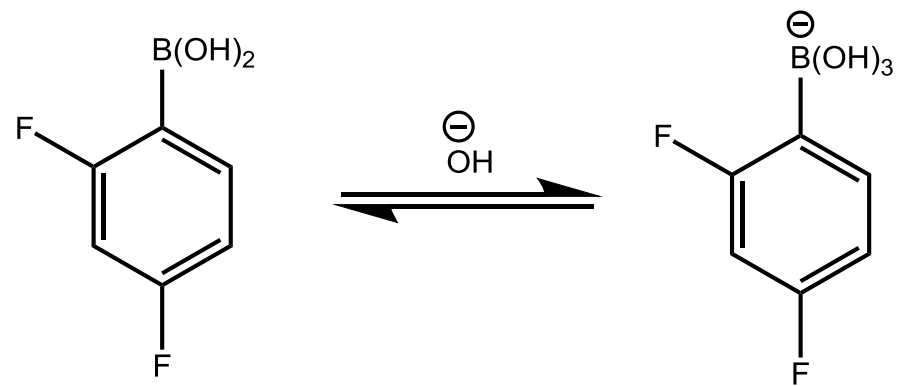






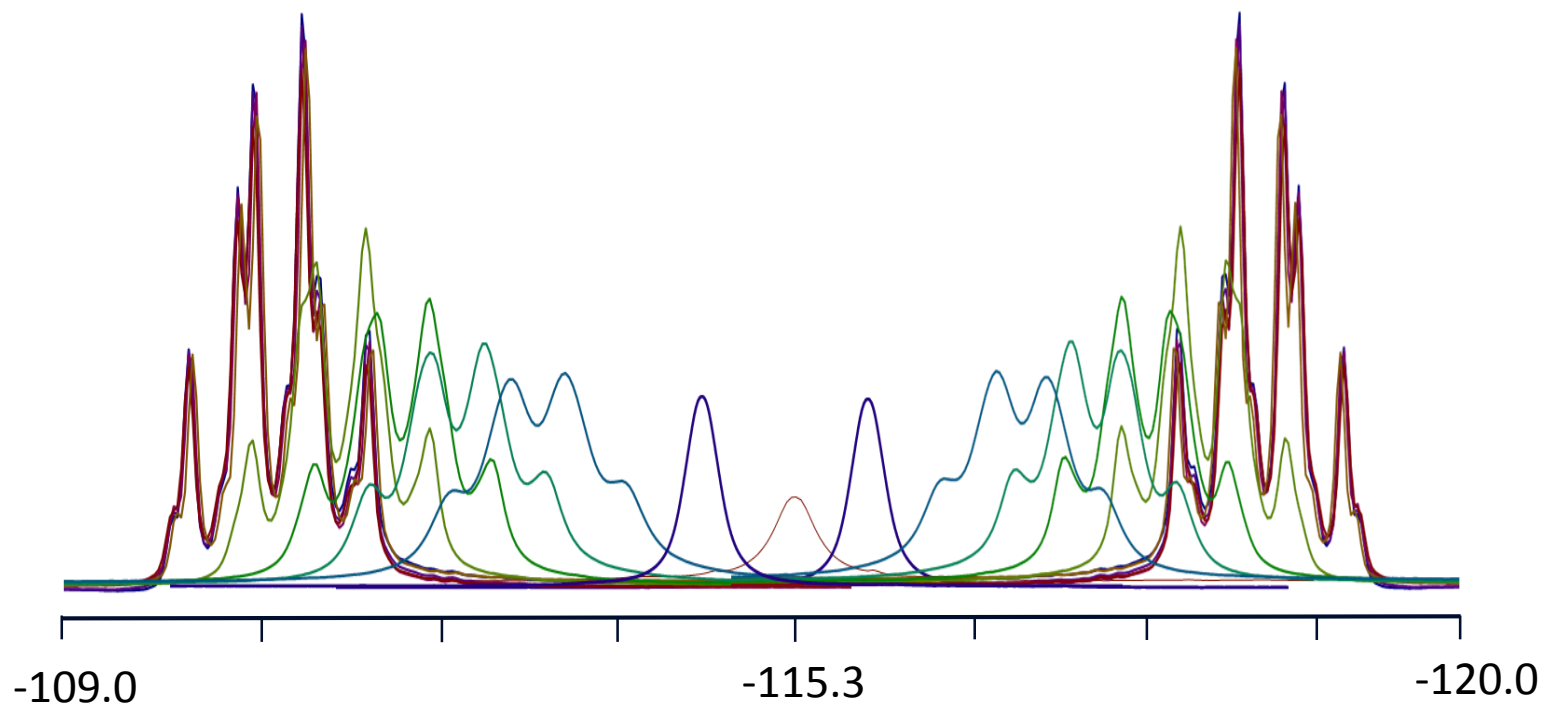
$t_{1/2} = 90$ seconds

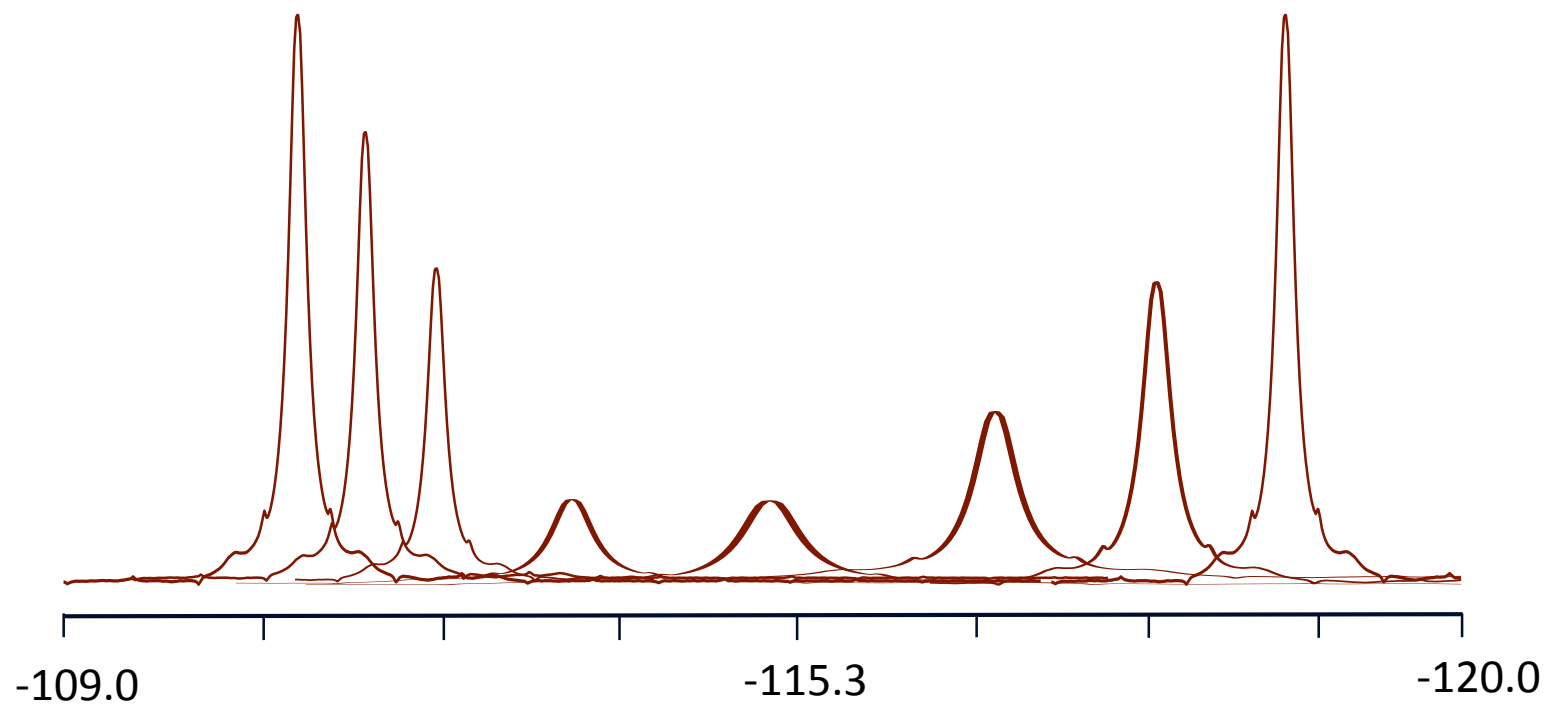
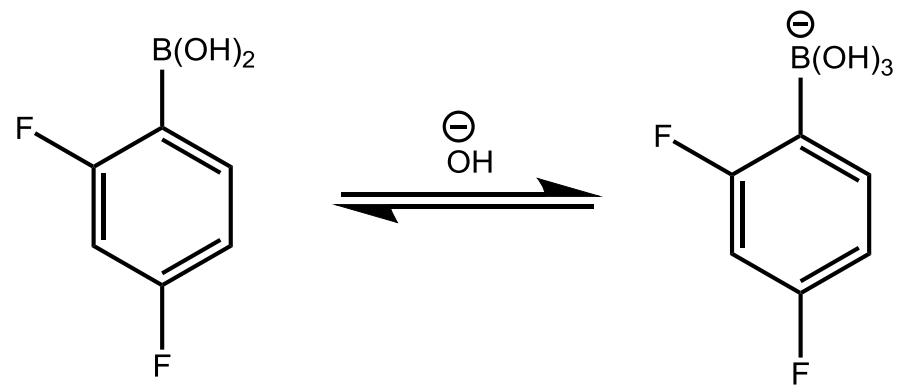


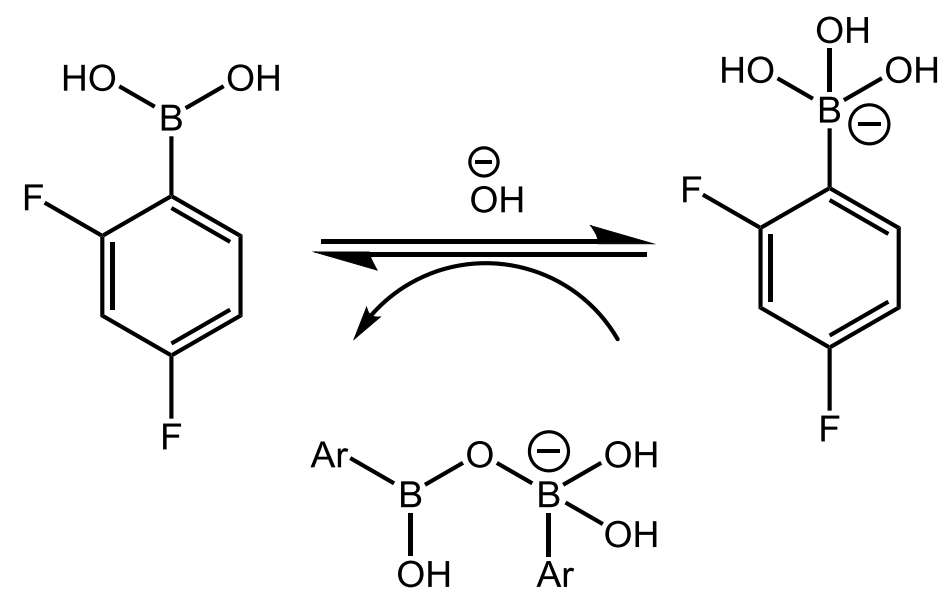


$$K_{ex} = \frac{p_A p_B \Delta\omega^2}{R_2 - R_2^0}$$

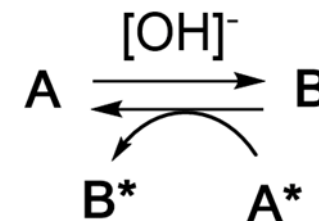
$$R_2 = \frac{1}{T_2}$$







$$K_{\text{ex}} = 1.3 \pm 0.2 \times 10^6 \text{ M}^{-1} \text{ s}^{-1}$$



Boric acid

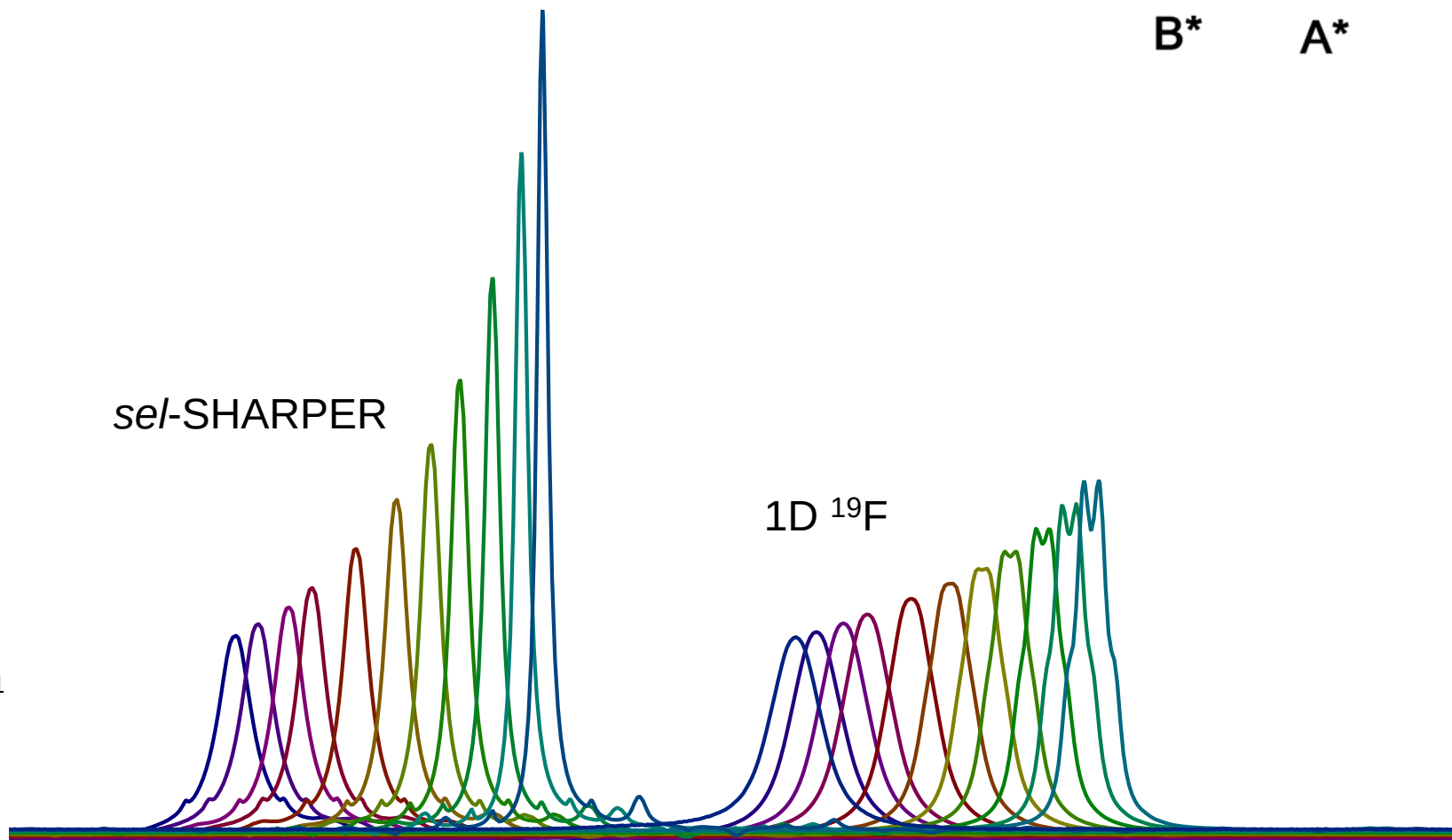
$$K = 2.6 \times 10^6 \text{ M}^{-1} \text{ s}^{-1}$$

Methylboronic acid

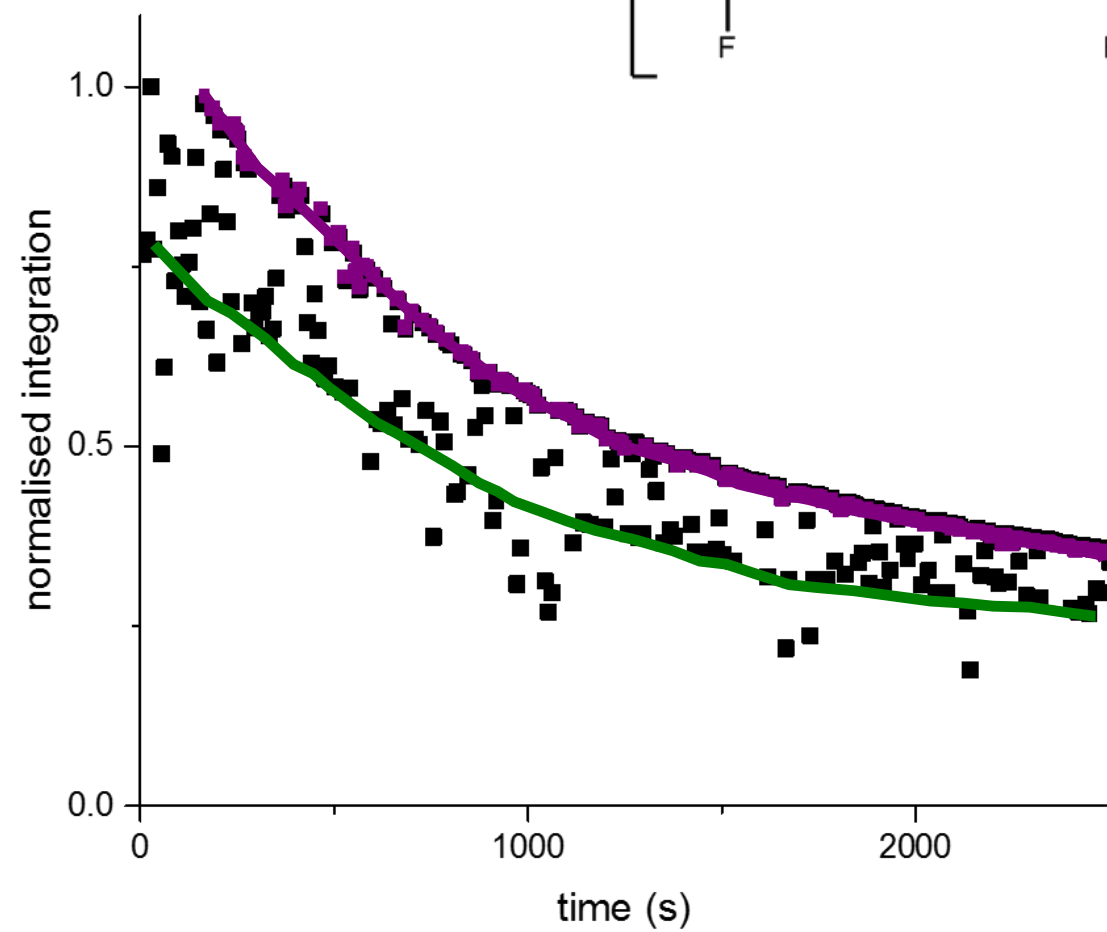
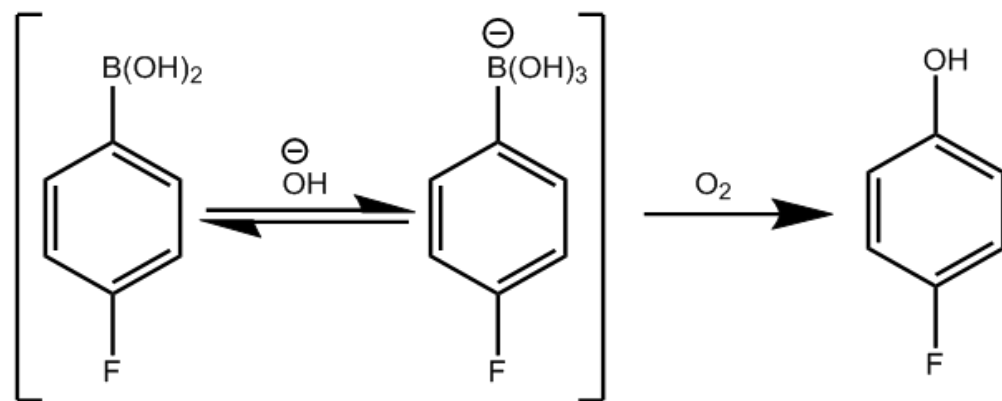
$$K = 0.70 \times 10^6 \text{ M}^{-1} \text{ s}^{-1}$$

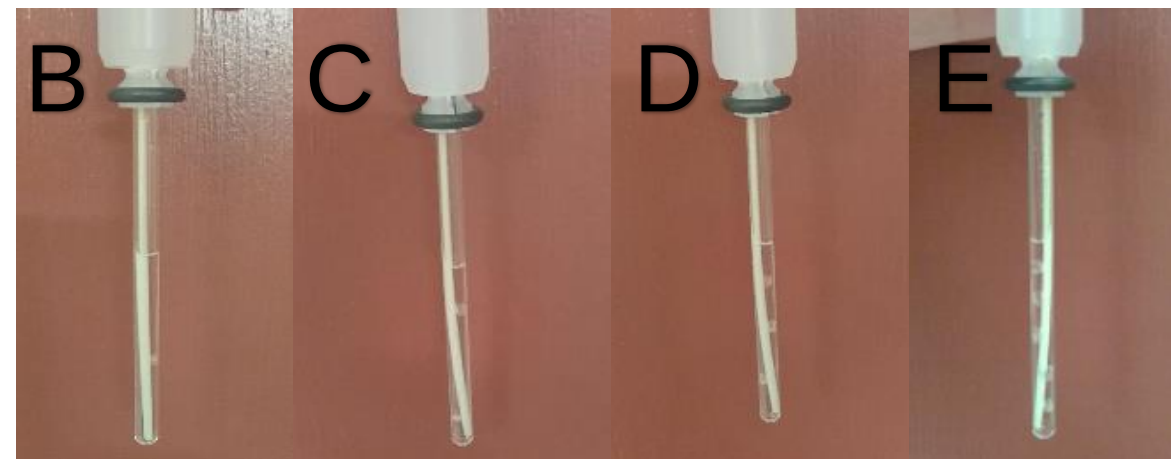
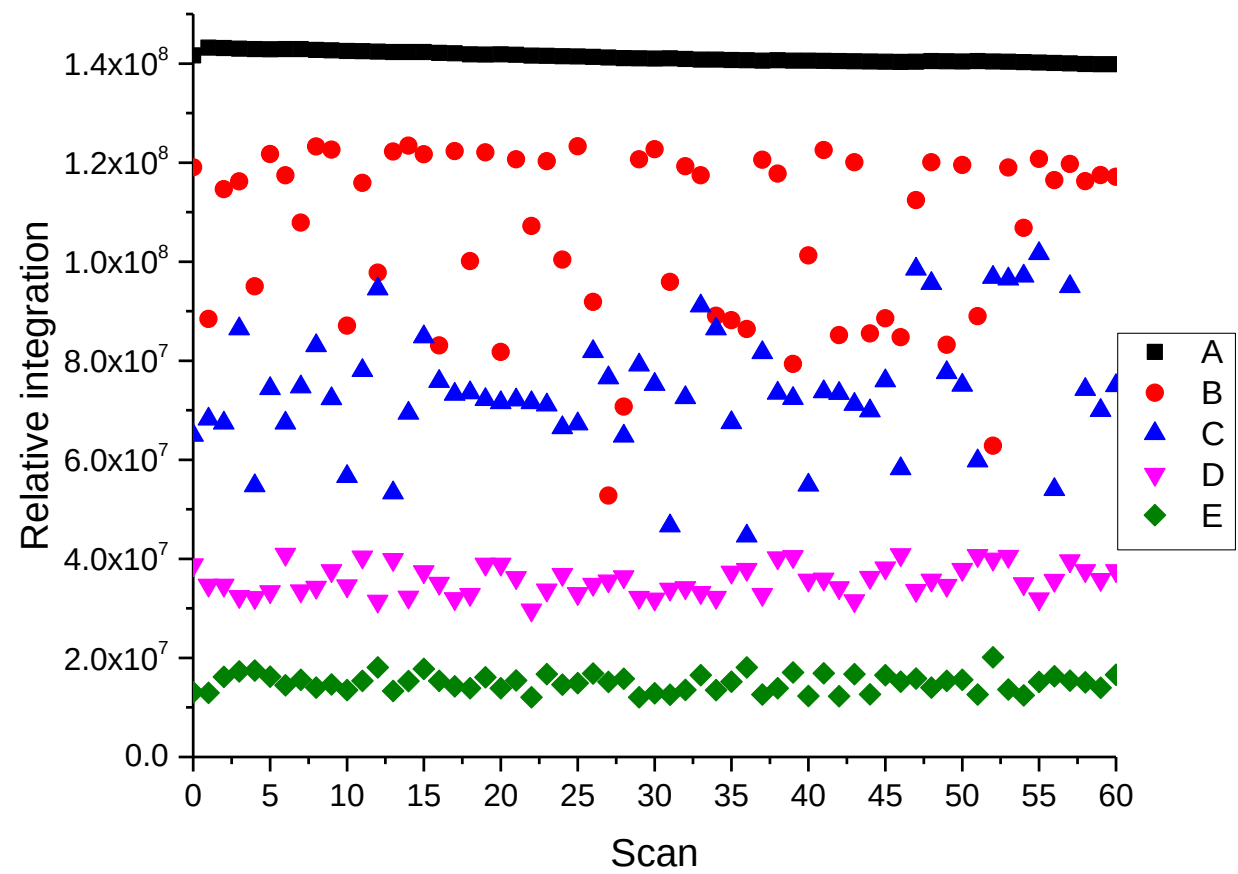
se/-SHARPER

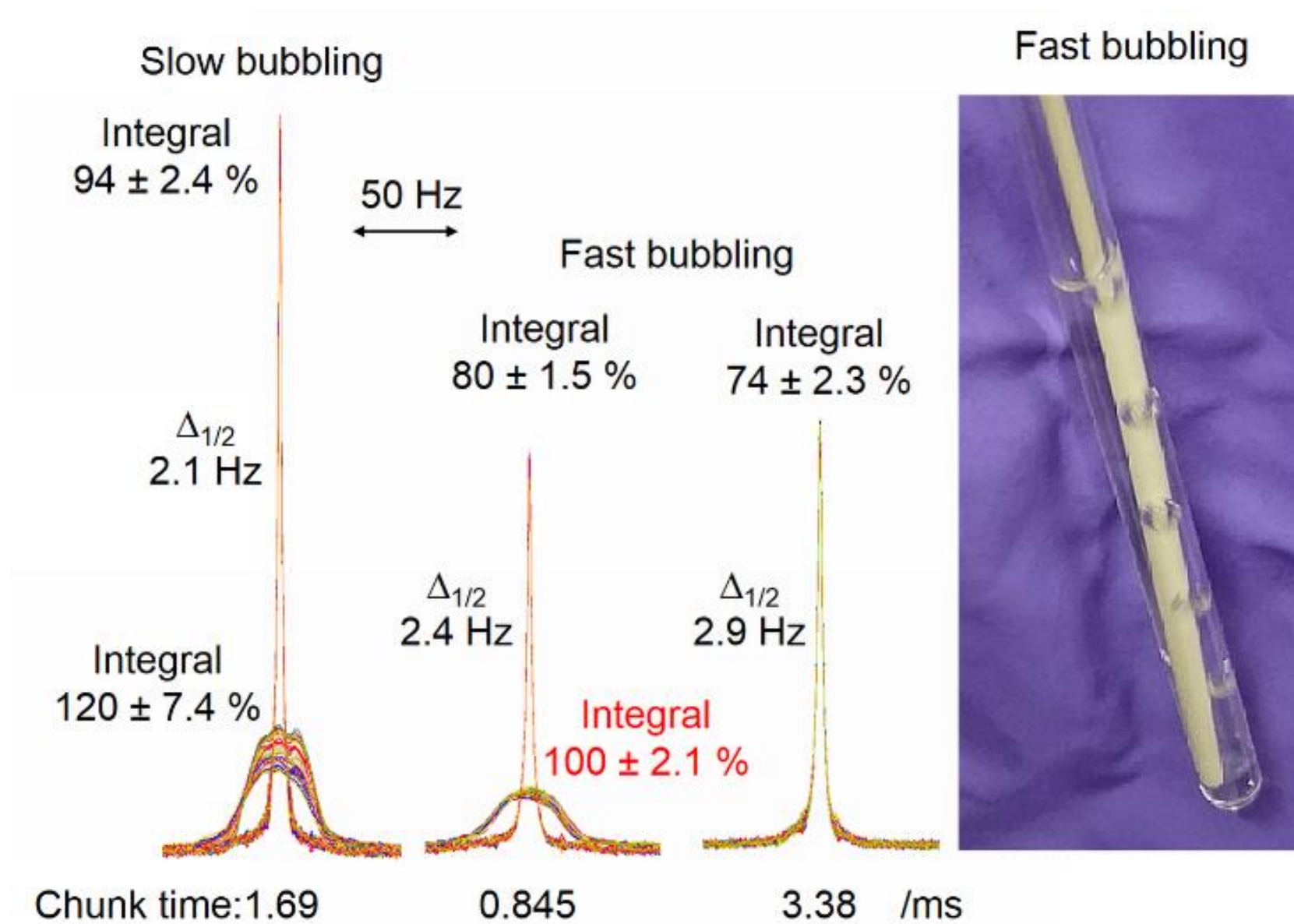
1D ^{19}F



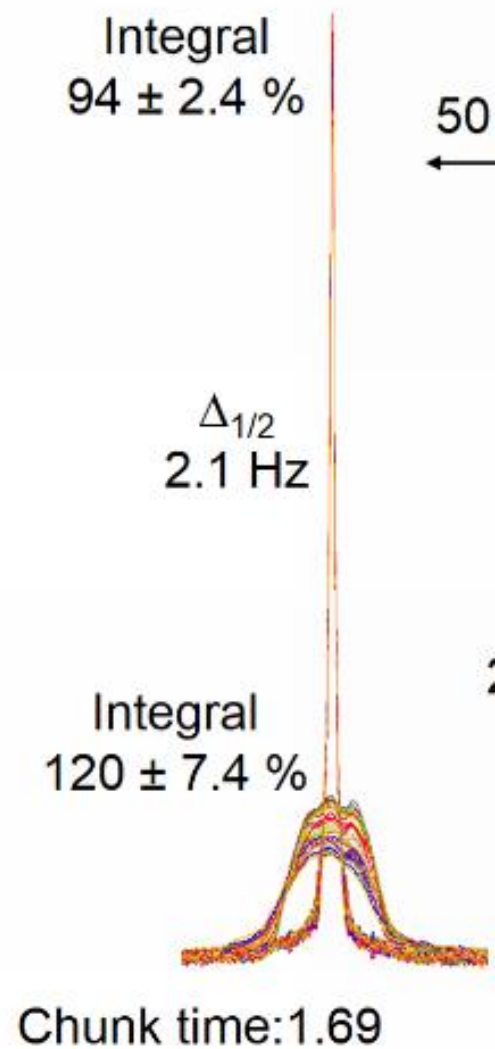
Real time



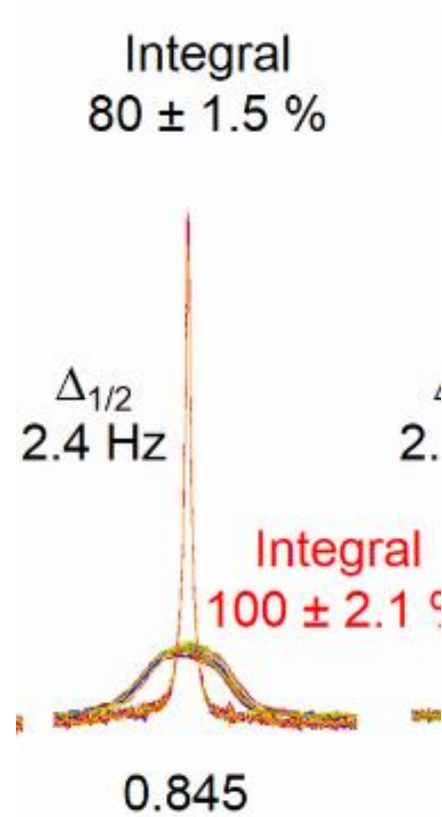


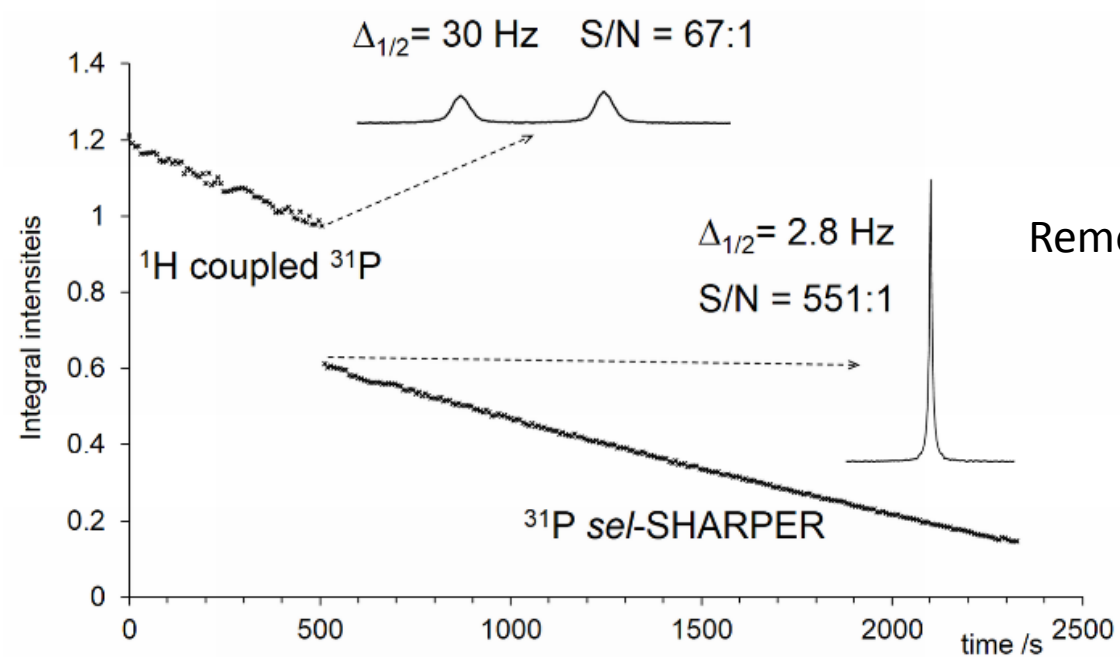
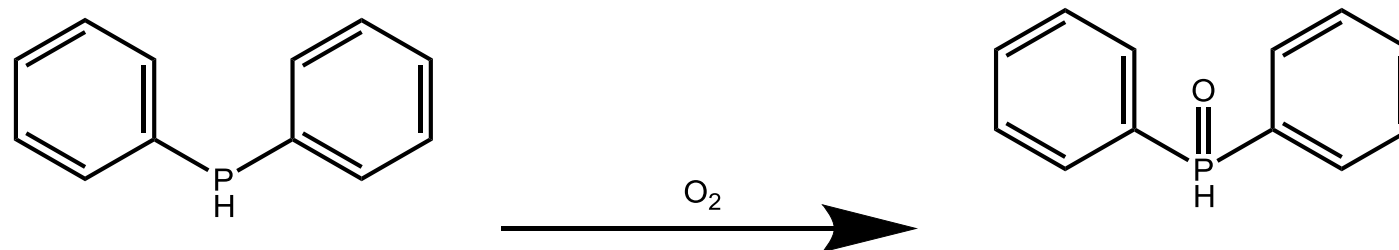


Slow bubbling



Fast bubbling





Acknowledgements

