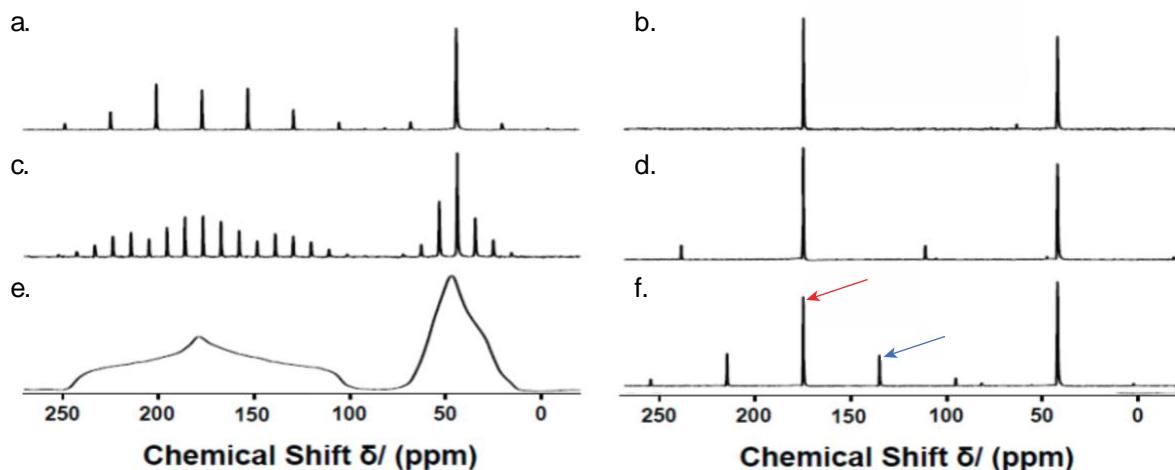


Jigsaw 5E

1. * Here are six solid-state NMR spectra of the same sample recorded at different MAS spinning rates: 0kHz (static), 1kHz, 3kHz, 5kHz, 8kHz and 14kHz.

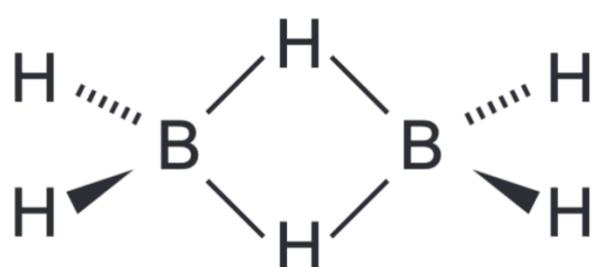


i. Which spectrum corresponds to each spinning rate?

ii. The red arrow indicates the isotropic shift, but what does the second arrow correspond to?

iii. What does the spacing between the peaks in part (ii) depend on?

2. [Hore Section 3.3] ^{11}B has a spin of $I = 3/2$. The structure of diborane, $^{11}\text{B}_2\text{H}_6$, is shown below.



a. Are the bridging protons chemically or magnetically equivalent to each other? What about the terminal protons?

b. Draw the expected ^1H spectra for the terminal and bridging protons in diborane. What are the expected relative intensities of the peaks?