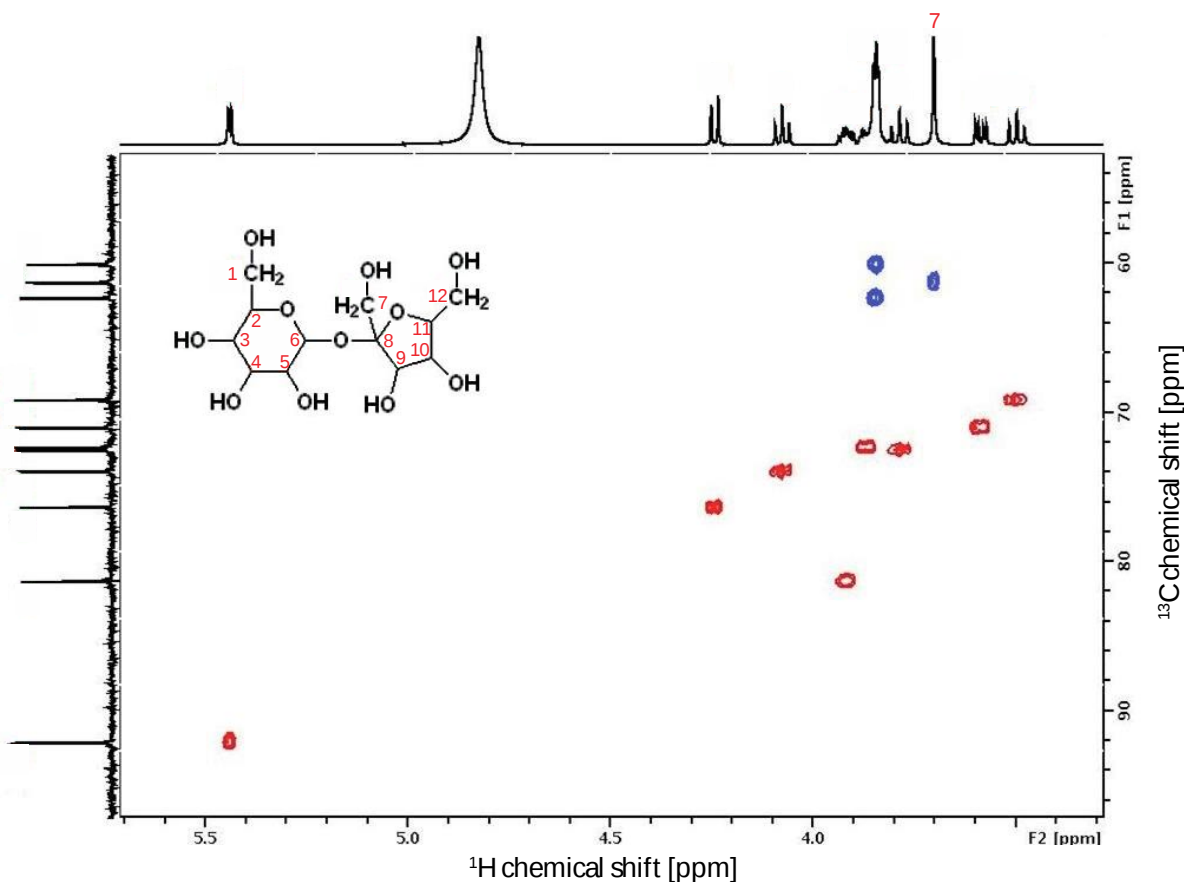
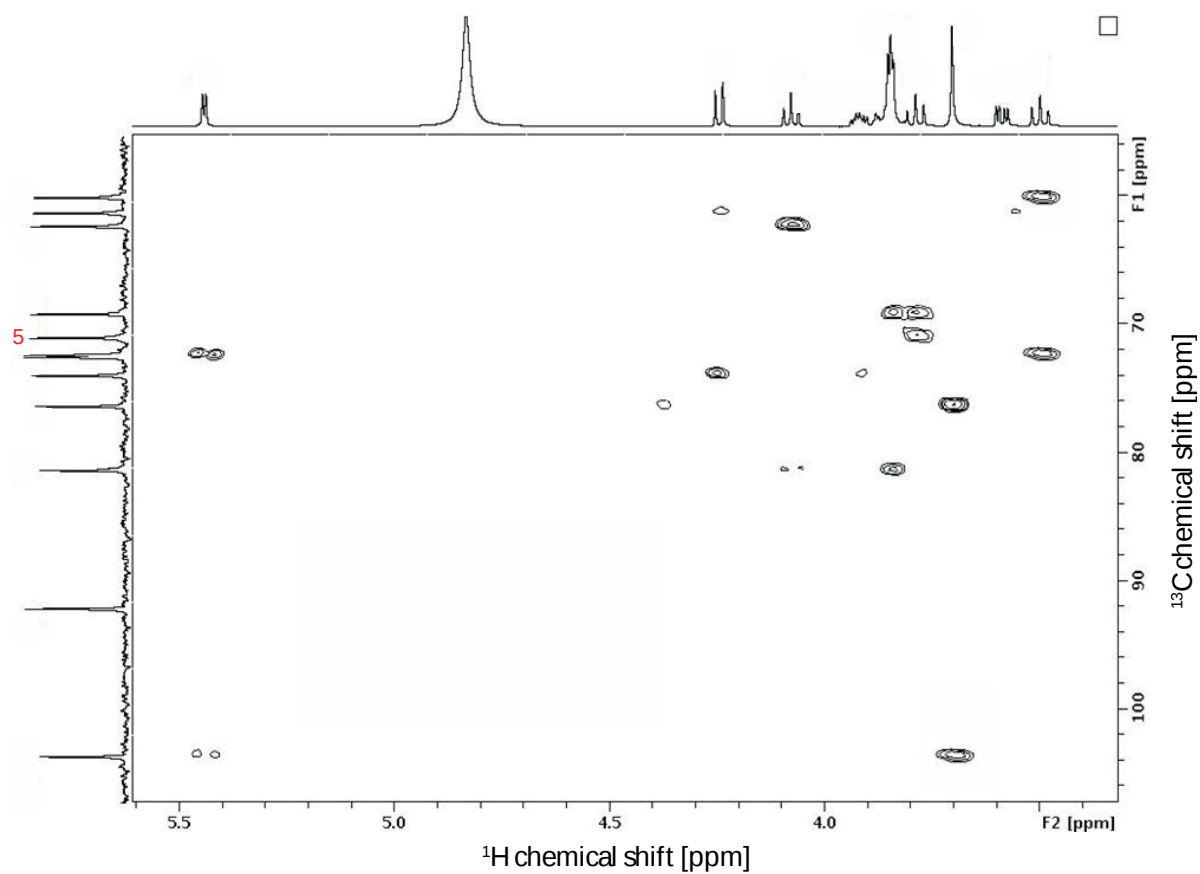


Jigsaw 4B

- [Keeler Sections 8.7 and 10.6] 2D NMR experiments are not limited to one nucleus, but we can also perform heteronuclear 2D NMR experiments. One example is the Heteronuclear Single Quantum Coherence (HSQC) experiment, which detects ^1H - ^{13}C single bond correlations. Another is the Heteronuclear Multiple Bond Correlation (HMBC) experiment, which gives correlations between carbons and protons that are separated by two or three bonds. Direct one-bond correlations are suppressed. The intensity of cross peaks depends on the coupling constant. Thus, the absence of a cross peak doesn't confirm that carbon-proton pairs are many bonds apart.
 - Two spectra for sucrose are shown below. Which spectrum corresponds to HSQC and which corresponds to HMBC? How do you know?
 - Assign the ^1H and ^{13}C . Notice that the axis limits vary between the experiments.





2. [Keeler Section 12.2 and Hore Section 3.3] Are the two bolded protons in the following molecule chemically or magnetically equivalent? What about the two bromine atoms?

