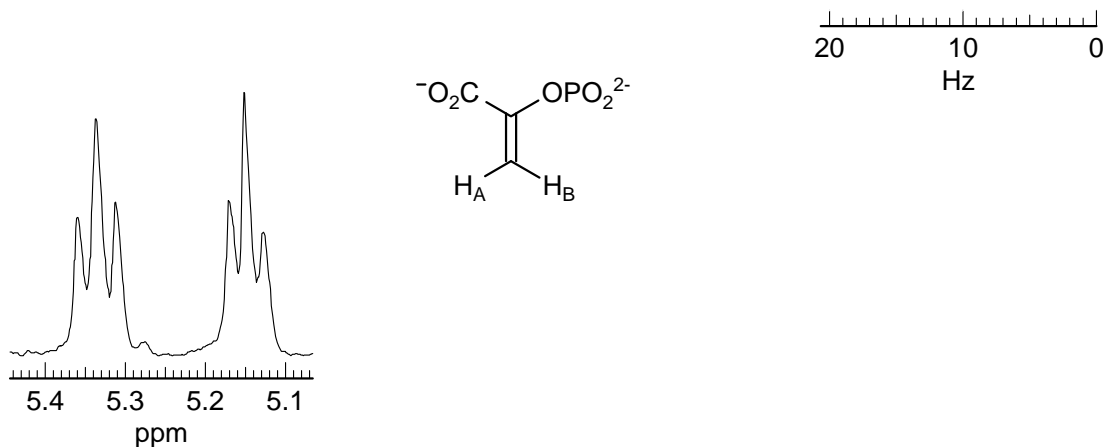
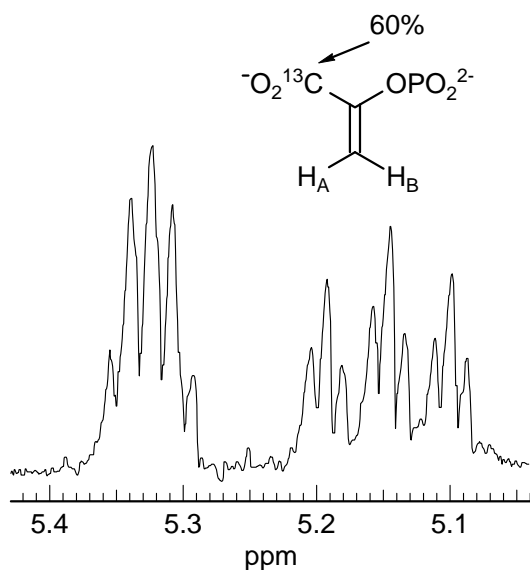


Problem R-85K ($\text{C}_3\text{H}_2\text{O}_5\text{P Na}_3$) Source: *J. Am. Chem. Soc.* **1970**, 92, 4095 (digitized hard copy).

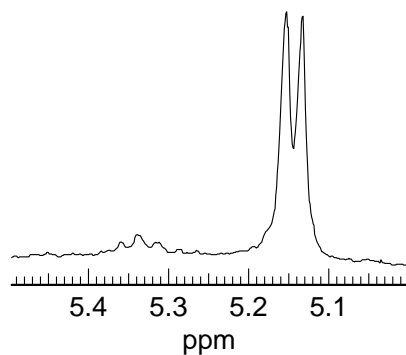
(a) The 60 MHz ^1H NMR spectrum of phosphoenolpyruvate (PEP) is shown below. Analyze the multiplets and assign the couplings



(b) The 100 MHz ^1H NMR spectrum of PEP labeled 60% with ^{13}C at the carboxyl carbon is shown below. Analyze the multiplets and assign the chemical shifts and couplings.

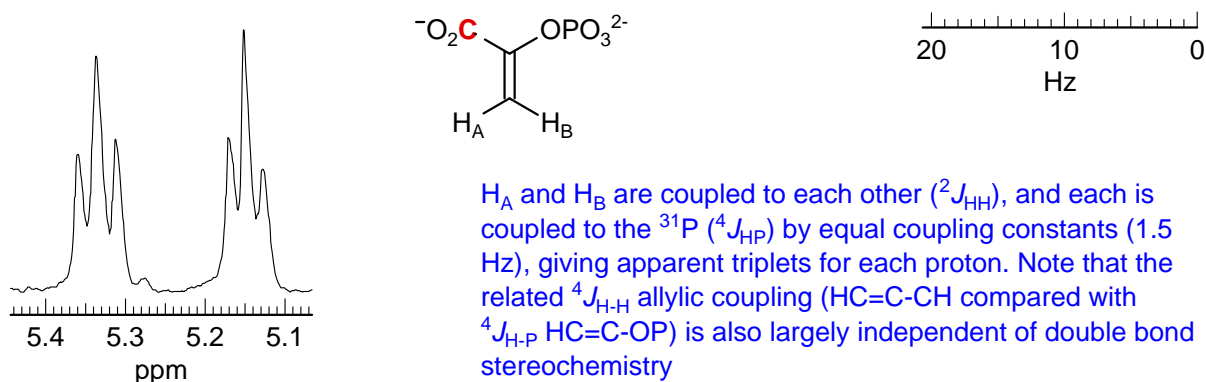


(c) The 60 MHz ^1H NMR spectrum of PEP labeled with one deuterium atom is shown below. Draw the structure of the compound, include stereochemistry.

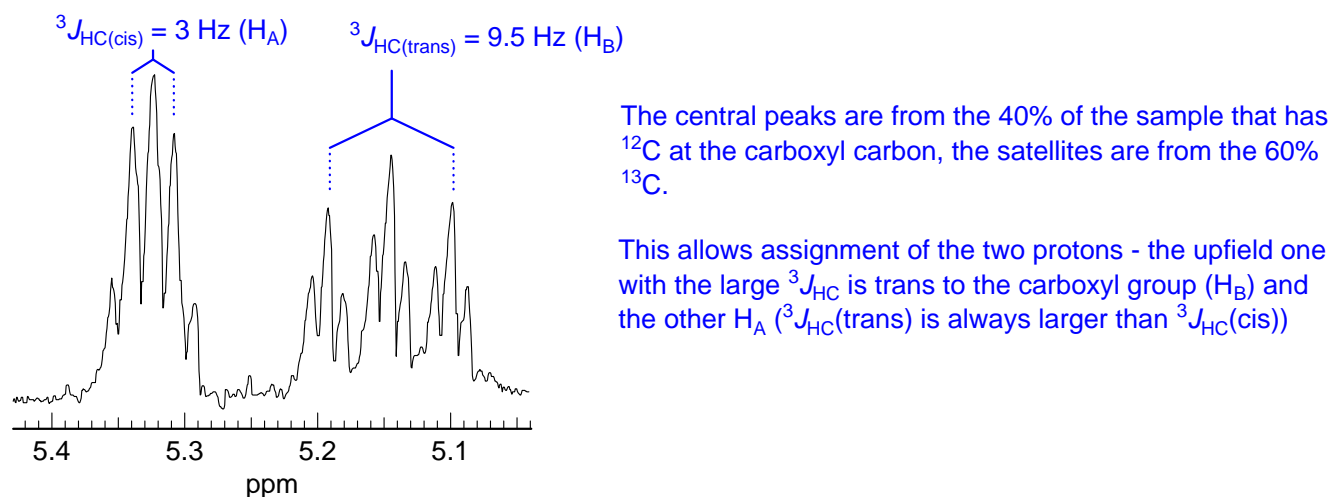


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