Problem NMR11.3.
A compound was shown via high-resolution mass spectrometry to have the probable formula $\text{C}_5\text{H}_8\text{O}_2$.

a) What is the degree of unsaturation in this compound?

b) IR spectroscopy gave the following data: 2950 (m), 2825 (m), 2716 (m), 1724 (s), 1505 (m), 1056 (w) cm$^{-1}$. Provide a data table with possible assignments for these peaks.

c) $^1\text{H}$ NMR spectroscopy provided the following spectrum. Provide a data table with partial structures for each peak.

d) Suggest a likely structure for this compound.