Problem NMR11.2. A compound was shown via high-resolution mass spectrometry to have the probable formula C$_6$H$_{10}$O$_2$.

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

b) IR spectroscopy gave the following data: 3105 (w), 2950 (m), 1517 (m), 1235 (s), 1056 (s), 715 (m) cm$^{-1}$. Provide a data table with possible assignments for these peaks.

c) $^1$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.