1. (8) Draw a structure that is compatible with the following IR spectrum. The molecular formula is $\text{C}_{10}\text{H}_{14}$. You must show your work and reasoning below and on the spectrum.
2. (8) Draw a structure that is compatible with the following IR spectrum. The molecular formula is C$_6$H$_{10}$O. You must show your work and reasoning below and on the spectrum. Hint: the molecule does not contain any rings.
3. In the mass spectra of 2-methylbutane and 2,2-dimethylpropane, each has a prominent peak at \( m/z = 57 \), corresponding to a fragmentation process of 15 from the molecular ion. In the mass spectrum of 3-methylpentane, there is a very low intensity peak at \( M - 15 \), but there is a peak of very high intensity at \( M - 29 \), however. Explain.