

### 3.9: Misleading Peaks

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There are some practical problems that can make IR interpretation in real life more difficult. Being aware of these problems may make you double-check your suspicions:

- water in the sample. Since water contains O-H bonds, water in a sample will make it appear as if the compound contains O-H bonds. There are experimental techniques for removing water from a sample but they must be done carefully.
- overtones in a spectrum. Overtones are absorptions occurring at different multiples of the normal frequency. Strong overtones of carbonyl peaks often occur at about twice the normal wavenumber. A large peak at  $1750\text{ cm}^{-1}$  might be accompanied by a smaller peak at  $3500\text{ cm}^{-1}$ , and could be confused with an O-H peak.

In addition, there are complications that you may run into based on the instrument or technique used to obtain the spectrum.

- Note that the x-axis scale on the spectrum is not uniform: the scale is indexed every  $1000\text{ cm}^{-1}$  between  $4000$  and  $2000\text{ cm}^{-1}$  and every  $500\text{ cm}^{-1}$  below that. Spectra from different instruments may display this scale differently.
- Different techniques may lead to increased absorption at one end of the spectrum vs. the other. For example, an OH stretch is much more dominant if the sample is prepared in a KBr mull than if the spectrum is obtained via attenuated total reflectance.

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