Problem IR.15.

1. Identify at least three important peaks/bonds in each of the following IR spectra.
2. Identify the functional group present in each of these samples. See the Functional Group Section for help.
3. Draw a possible structure for each of these compounds (there may be many, many correct answers).
Problem IR.16.

Sketch an approximate IR spectrum for each of the following compounds:

a) \( \text{phenol} \) 

b) \( \text{cyclopropane} \) 

c) \( \text{aniline} \) 

d) \( \text{benzonitrile} \) 

e) \( \text{cyclobutanol} \) 

f) \( \text{cyclopentanol} \) 

g) \( \text{cyclohexanone} \) 

Problem IR.17.

The out-of-plane (oop) bends are sometimes useful in distinguishing substitution patterns around a benzene ring. Using the spectra of \( \alpha-, m-, \) and \( p-\text{xylene} \), formulate some guidelines about what the oop bends look like when substituents are one, two or three carbons away on a benzene ring.

\( \text{\alpha-xylene} \) 

\( \text{\textit{m}-xylene} \) 

\( \text{\textit{p}-xylene} \)
Figure IR18. IR spectrum of m-xylene.


Figure IR19. IR spectrum of o-xylene.

Figure IR20. IR spectrum of p-xylene.


Contributors

Chris P Schaller, Ph.D., (College of Saint Benedict / Saint John’s University)