Week 8 Worksheet

Topics Covered:

- Introduction to IR spectroscopy
  - Understanding factors affecting wave number
  - Identifying functional groups via IR spectroscopy
  - Identifying different compounds via IR spectroscopy

1. Which of the following compounds has a C=O bond that absorbs at the highest wavenumber? Which of the following compounds has a C=O bond that absorbs at the lowest wavenumber? (Smith 6th, End of Chapter pq B.23)

![Chemical Structures]

2. Rank the following compounds in order of increasing wavenumber of the carbonyl absorption in the IR. (Smith 6th, End of Chapter pq B. 24)

![Chemical Structures]
3. What are the major IR absorptions in the function group region of each compound? You do not need to know the exact wavenumber. You just need to identify the major groups. (Smith 6th, Chapter pq B.12)

![Chemistry structure](image)

a.

![Chemistry structure](image)

b.

c.

![Chemistry structure](image)

d.

4. Morphine, heroine, and oxycodone are three addicting analgesic narcotics. How could IR spectroscopy be used to distinguish these three compounds from each other? (Smith 6th, End of Chapter pq B.22)
5. Match 2 out of the 4 compounds to their IR spectrums. (Smith 6th, End of Chapter pq B.27)
6. Tell how IR spectroscopy could be used to determine when each reaction is complete. (Smith 6th, End of Chapter pq B.26)
   a. Kl
   b. kl