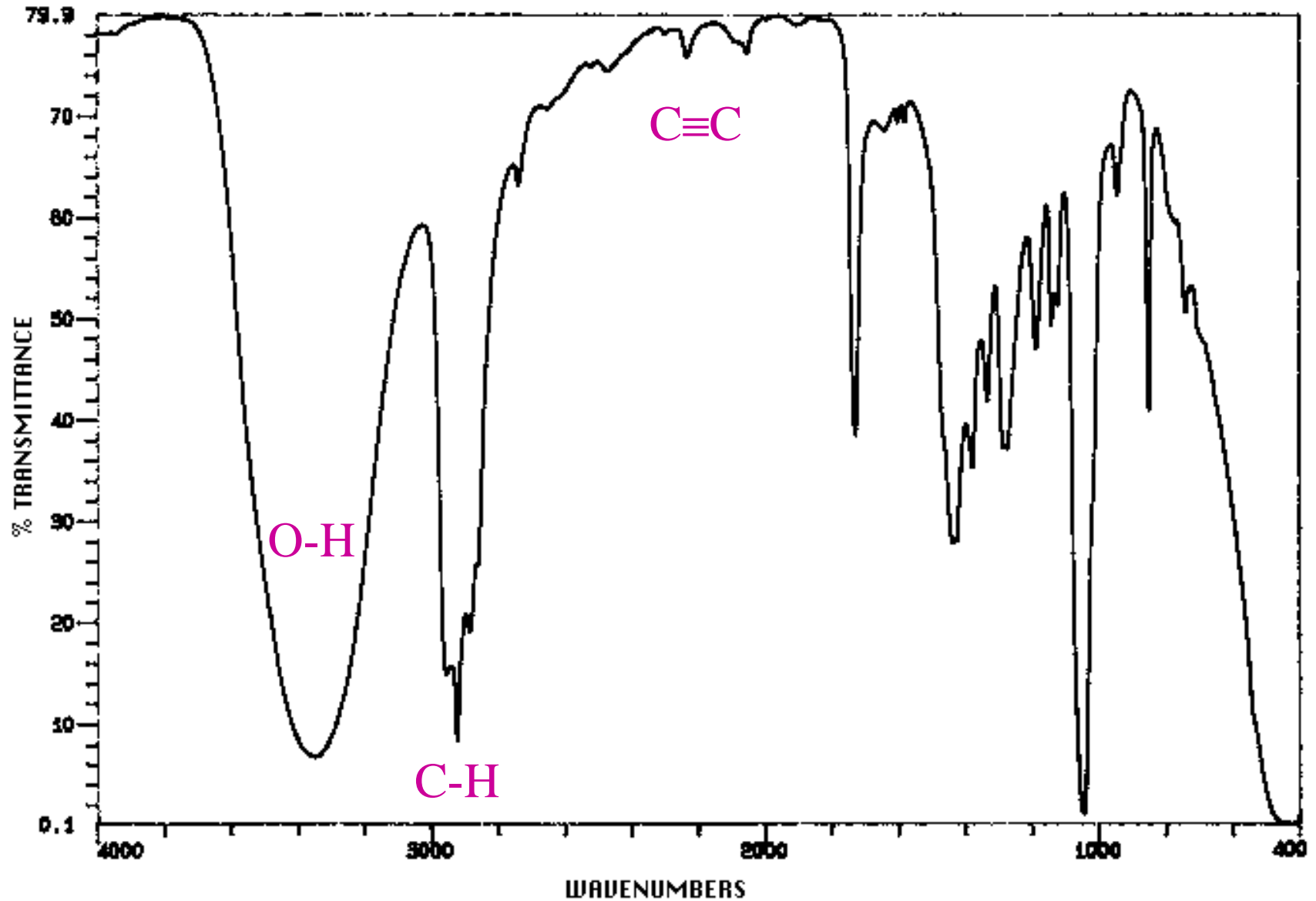


# Infrared Spectroscopy Problems

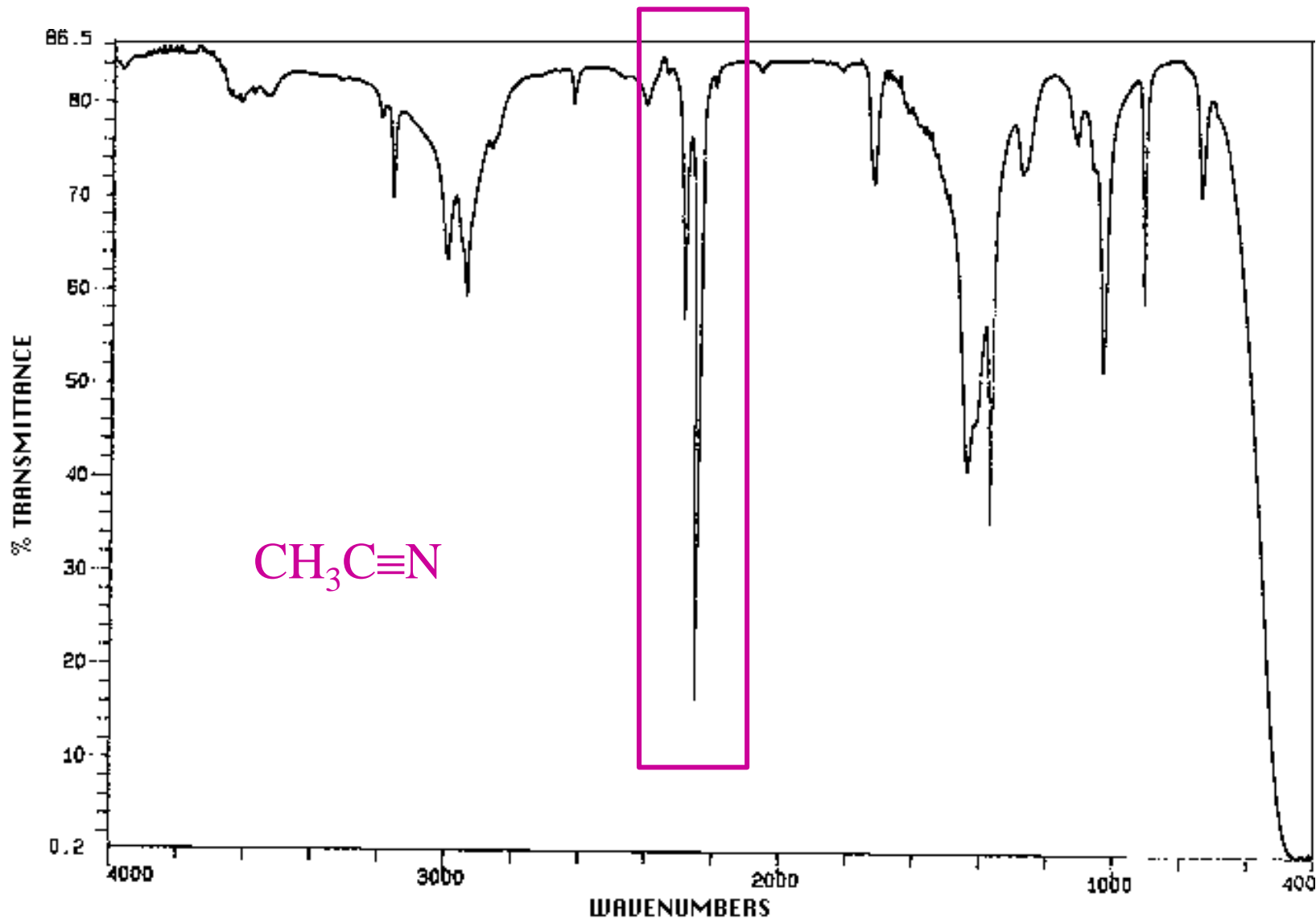
# What Functional Groups are Present?



# Summary of important frequencies

- Stretching vibrations
  - To hydrogen  $>2500\text{ cm}^{-1}$ 
    - C-H:  $\sim 3000\text{ cm}^{-1}$
    - O-H:  $3200\text{-}3600\text{ cm}^{-1}$  (lower in carboxylic acids)
    - N-H:  $3300\text{-}3500\text{ cm}^{-1}$
  - Double bonds:  $1600\text{-}1800\text{ cm}^{-1}$ 
    - C=C:  $\sim 1650\text{ cm}^{-1}$
    - C=O:  $\sim 1630\text{-}1780\text{ cm}^{-1}$
  - Triple bonds:  $2100\text{-}2300\text{ cm}^{-1}$ 
    - C $\equiv$ C:  $\sim 2200\text{ cm}^{-1}$
    - C $\equiv$ N:  $\sim 2250\text{ cm}^{-1}$

# What Functional Groups are Possible?



# CSCl<sub>2</sub>: Explain the boxed peak

