

Problems discussed in videos:

Video (1)

35. Match each of the following structures [drawn on board in video] with the IR data that correspond best. Abbreviations: w, weak; m, medium; s, strong; br, broad.

(a) 905 (s), 995 (m), 1040 (m), 1640 (m), 2850-2980 (s), 3090 (m), 3400 (s, br)  $\text{cm}^{-1}$ ;

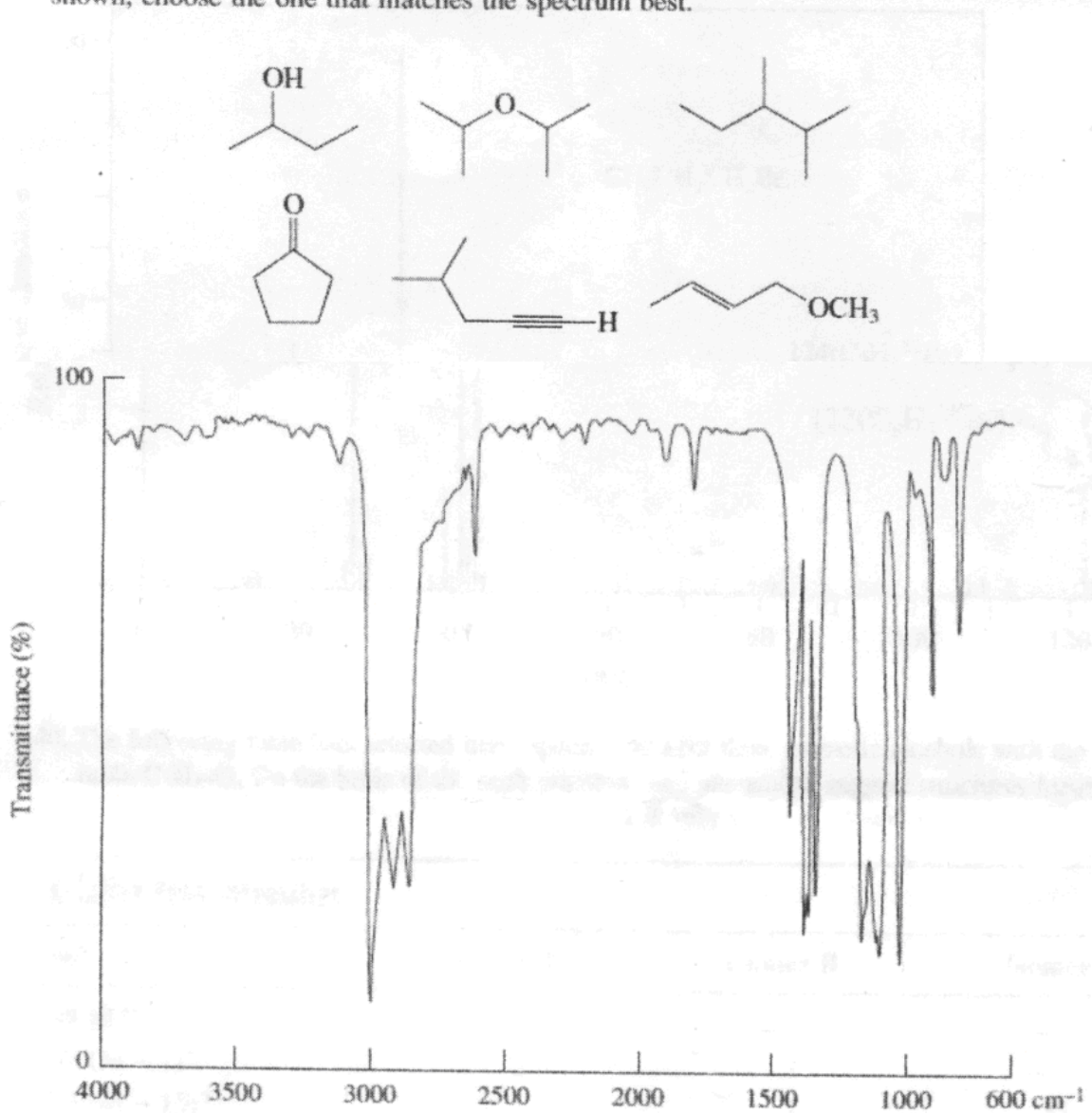
(b) 2840 (s), 2930 (s)  $\text{cm}^{-1}$ ;

(c) 1665 (m), 2890-2990 (s), 3030 (m)  $\text{cm}^{-1}$ ;

(d) 1040 (m), 2810-2930 (s), 3300 (s, br)  $\text{cm}^{-1}$

Videos (1)-(2)

37. An organic compound exhibits IR spectrum F, on p. 494. From the group of structures shown, choose the one that matches the spectrum best.



Videos (2)-(3)

36. You have just entered the chemistry stockroom to look for several isomeric bromopentanes. There are three bottles on the shelf marked  $C_5H_{11}Br$ , but their labels have fallen off. The NMR machine is broken, so you devise the following experiment in an attempt to determine which isomer is in which bottle: You first treat a sample of the contents in each bottle with NaOH in aqueous ethanol, and then you determine the IR spectrum of each product or product mixture. Here are the results:

(i)  $C_5H_{11}Br$  isomer in bottle A  $\xrightarrow{NaOH}$  IR bands at 1660, 2850-3020, and  $3350\text{ cm}^{-1}$

(ii)  $C_5H_{11}Br$  isomer in bottle B  $\xrightarrow{NaOH}$  IR bands at 1670 and 2850-3020  $\text{cm}^{-1}$

(iii)  $C_5H_{11}Br$  isomer in bottle C  $\xrightarrow{NaOH}$  IR bands at 2850-2960, and  $3350\text{ cm}^{-1}$

**(a)** What do the data tell you about each product or product mixture?

**(b)** Suggest possible structures for the contents of each bottle.