1. The IR spectra shown below are those of ethanoic acid ,CH_3CO_2H, and ethanoic anhydride $(CH_3CO)_2O$. Draw the full structural formula of both compounds and determine, with reasons, which spectrum is due to which compound.

Figure 112

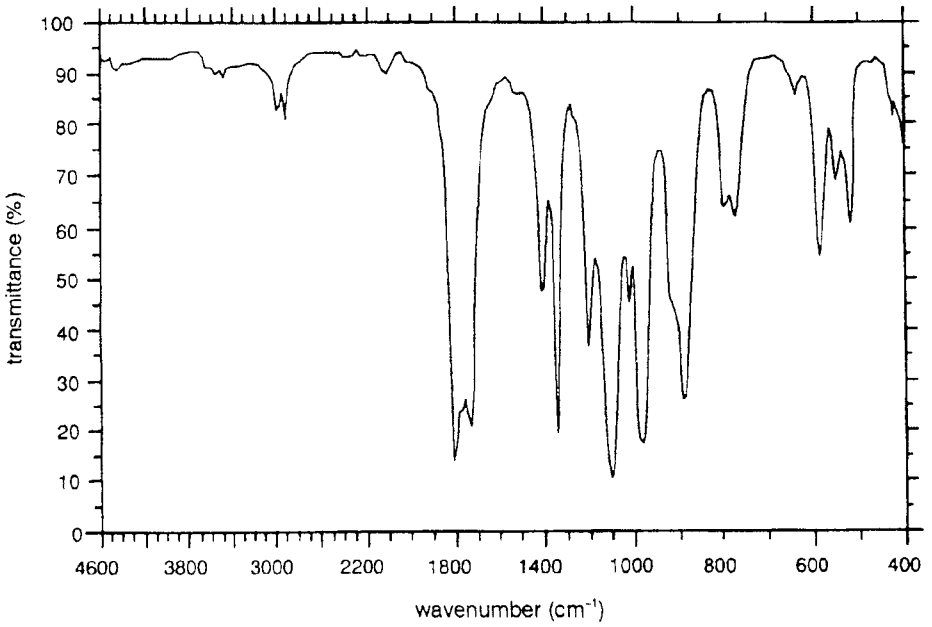
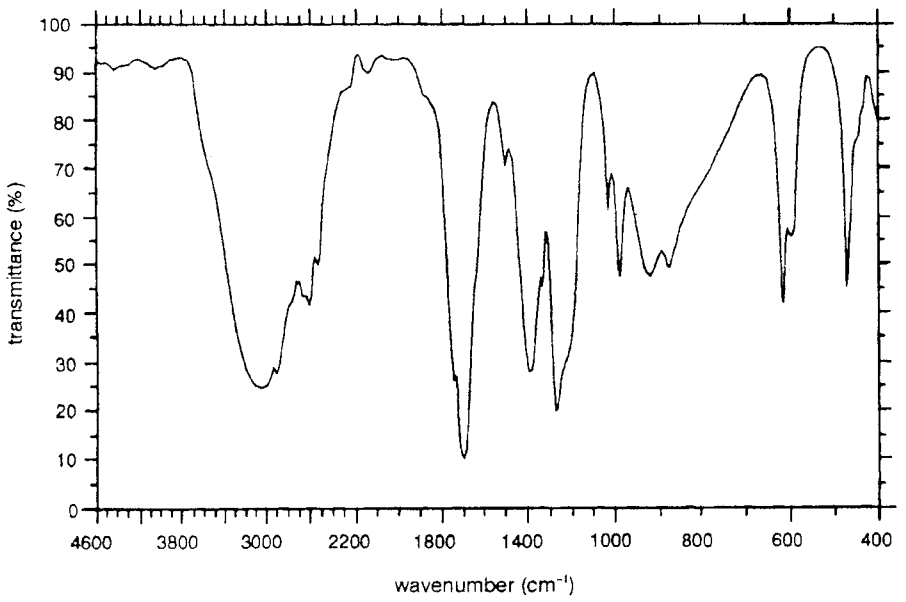


Figure 113



Question

The spectra below are of ethanoic acid, CH_3COOH (Figure 112), and ethanoic anhydride, $(CH_3CO)_2O$ (Figure 113). Draw the full structural formula for both compounds and then determine, giving reasons, which spectrum is due to which compound.

Figure 112

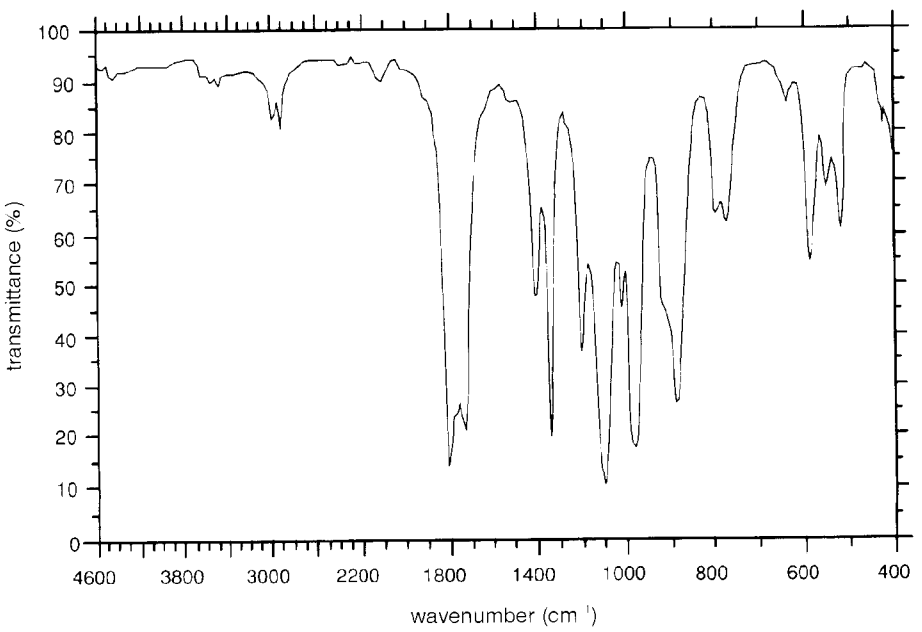
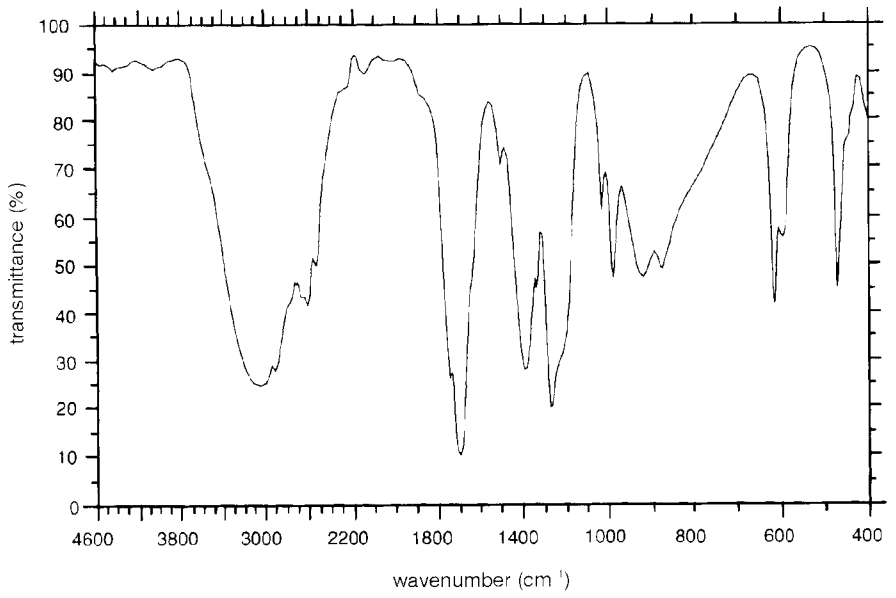


Figure 113



Question

The spectra below are of ethanoic acid, CH_3CCOH (Figure 112), and ethanoic anhydride, $(CH_3CO)_2O$ (Figure 113). Draw the full structural formula for both compounds and then determine, giving reasons, which spectrum is due to which compound.

Figure 112

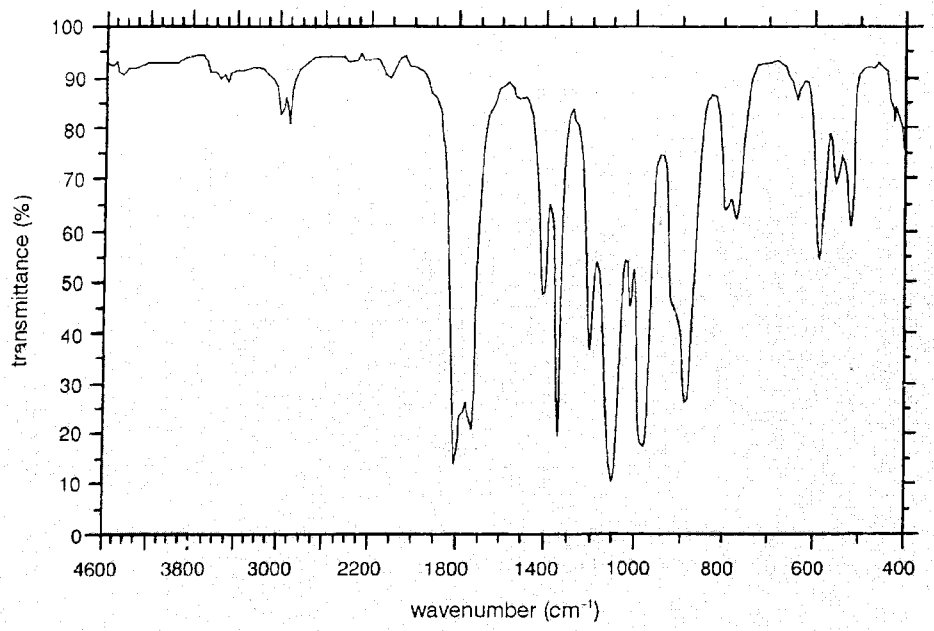
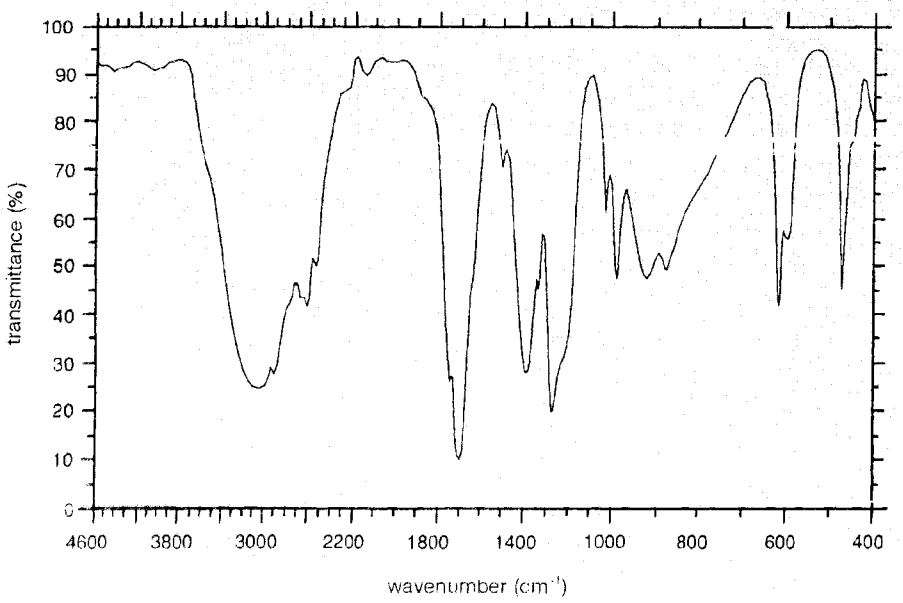
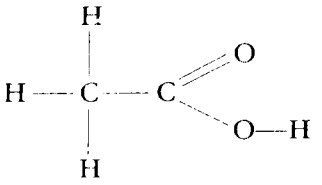


Figure 113

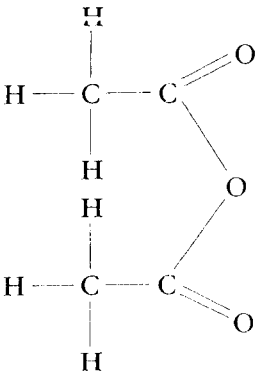


Answer

Ethanoic acid has structural formula:



Ethanoic anhydride has structural formula:



The main difference in the structures is the presence of the O—H bond in ethanoic acid.

The main difference in the two spectra is the broad peak at approximately 3200 cm^{-1} in Figure 113. This is due to the O—H bond, so Figure 113 shows the spectrum of ethanoic acid.