

Question #60408, Chemistry / Other |

Hello, due to not being able to upload pictures on this website I have included a link below with an image relating to this question.

http://s1186.photobucket.com/user/Spiderman93/media/Chemistry_zpsplzhkchv.jpg.html

You are provided with the following mass spectra, use the spectra to determine the composition of elements and compounds.

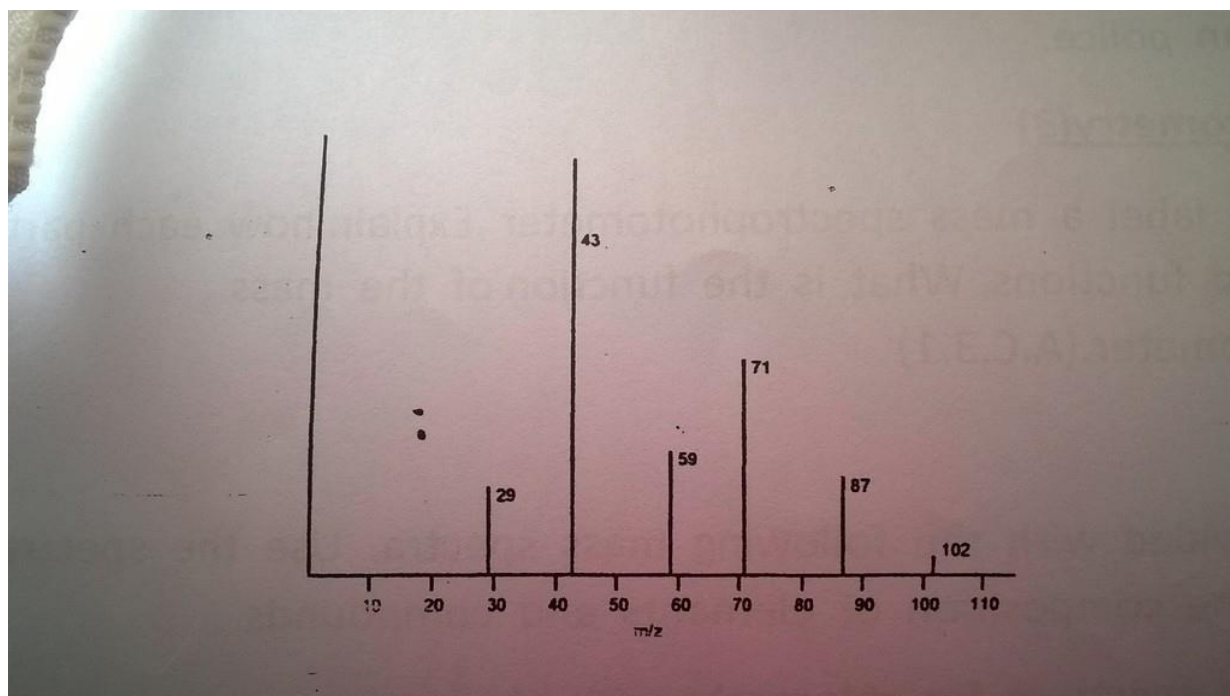
The mass spectrum of methyl butanoate is shown.

Identify the species responsible for all the signals shown.

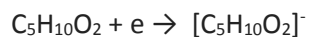
Write an equation for the formation of each species.

In detail please

Answer:



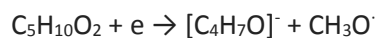
Methyl butanoate has molecular mass equals 102, so a signal at 102 m/z is the signal of molecular ion:



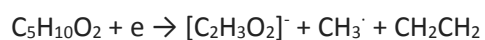
The difference between a signal at 87 and that mentioned above is 15 (102 - 87). It corresponds to losing of CH₃ group. Thus, an ion with 87 m/z is methyl butanoate without methyl group:



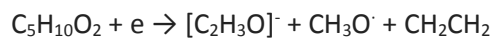
The difference between a signal at 71 and 87 is 16 (87 - 71). It corresponds to losing of O. Thus, an ion with 71 m/z is methyl butanoate without methoxy group:



The difference between a signal at 59 and 87 is 28 (87 - 59). It corresponds to losing of CH₂CH₂. Thus, an ion with 59 m/z is methyl butanoate without methyl group and ethene:



The difference between a signal at 43 and 59 is 16 (59 - 43). It corresponds to losing of O. Thus, an ion with 43 m/z is methyl butanoate without methoxy group and ethene:



The last one at 29 m/z is ethane without proton: [C₂H₅]⁻

It can be formed according to the equation:

