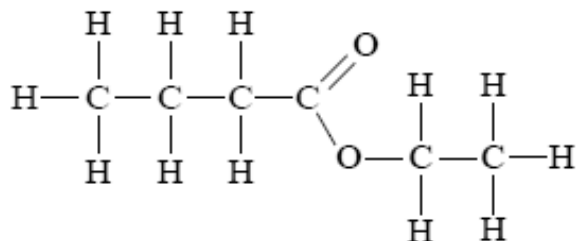


Friday Worksheet
Mass spectroscopy 3

Name:

1) Select the species that produces the molecular ion peak in the mass spectrum of the compound below.

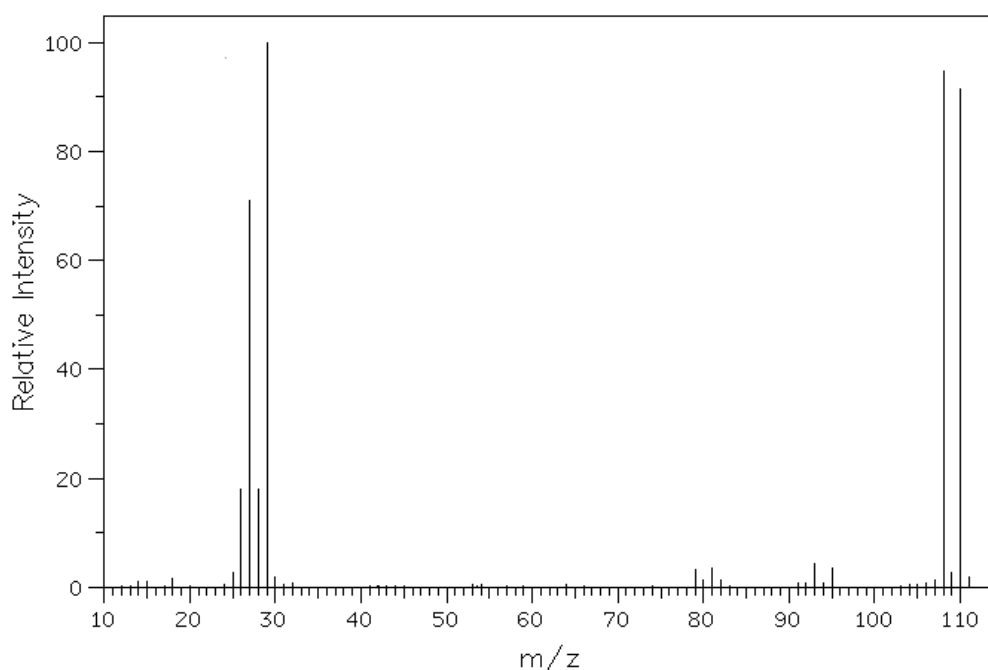


- i) $[\text{CH}_3\text{CH}_2\text{CH}_2\text{COOCH}_2\text{CH}_3]^+$
- ii) $[\text{CH}_3\text{CH}_2\text{CH}_2\text{COOCH}_2\text{CH}_3]^{2+}$
- iii) $[\text{CH}_3\text{CH}_2\text{CH}_2\text{COOCH}_2\text{CH}_3]^-$
- iv) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOCH}_2$

2) Which of the species above cannot be formed in a mass spectrometer? Explain

Negative charged fragments cannot form in the mass spectrometer. Positive charged fragments as well as neutral fragments can form. The answer is (iii).

3) Below is the mass spectrum of ethyl bromide ($\text{C}_2\text{H}_5\text{Br}$)



a) What fragment caused the peak at m/z 29?

C_2H_5^+

b) Why are there two peaks around m/z 110?

This is due to the two isotopes, ^{79}Br and ^{81}Br

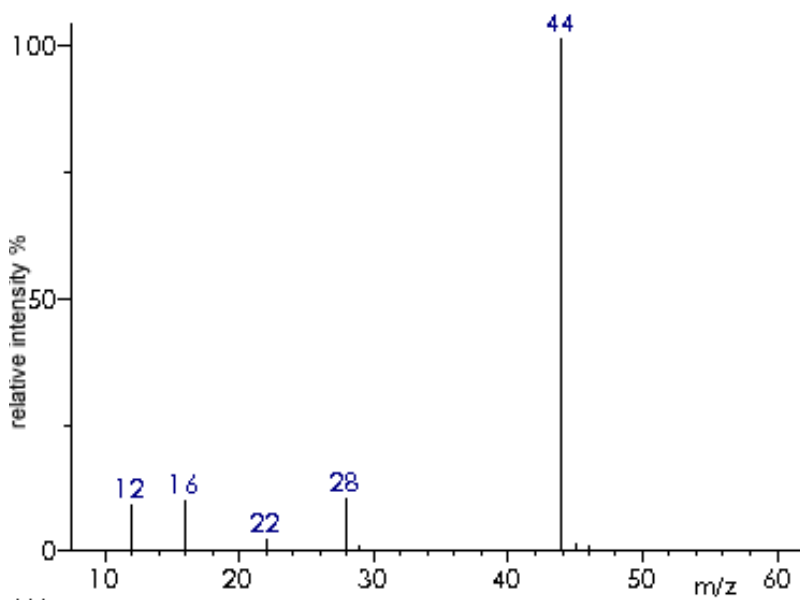
c) The peak at m/z 29 represents the loss of what fragment from the molecule?

Br

- d) What do the peaks at m/z 108 and 110 indicate about the relative abundance of the isotopes ^{79}Br and ^{81}Br

The ^{79}Br isotope is slightly more abundant than the ^{81}Br isotope.

- 4) Below is a mass spectrum of a molecule.



- a) Identify the parent ion peak
 m/z 44
- b) Identify the base peak
 m/z 44
- c) What fragment caused the peak at m/z 22 and 28?
 CO_2^{2+} at m/z 22 and CO^+ at m/z 28
- d) Identify the molecule
 CO_2