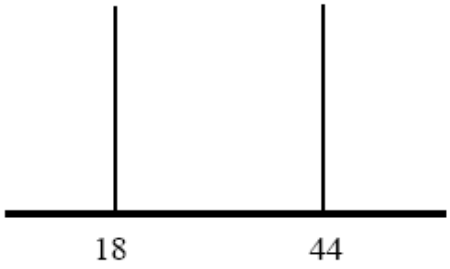
Problems discussed in the videos:

Video (1)

5) Combustion of a hydrocarbon with O_2 yields products with the mass spectrum shown. What is the hydrocarbon?

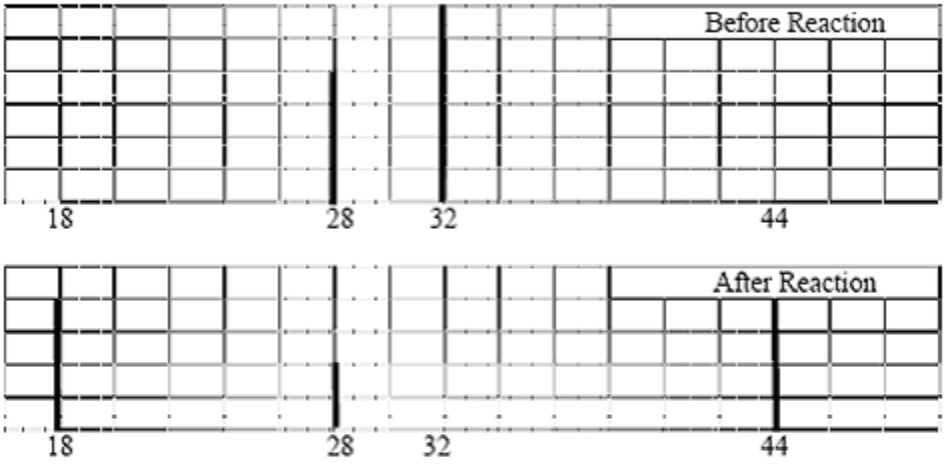


A) C_2H_4
B) C_2H_2
C) C_4H_{10}
D) C_3H_8
E) CH_4

Video (2)

23) Mystery Hydrocarbon and Mass Spectrometry

A hydrocarbon (C_xH_y) was combusted in oxygen gas (O_2). The reaction was monitored using mass spectrometry. Spectra taken before and after the reaction are shown below. Use the spectra to answer the following questions.



a) Assign the peaks in the mass spectra to the molecules involved in the reaction.

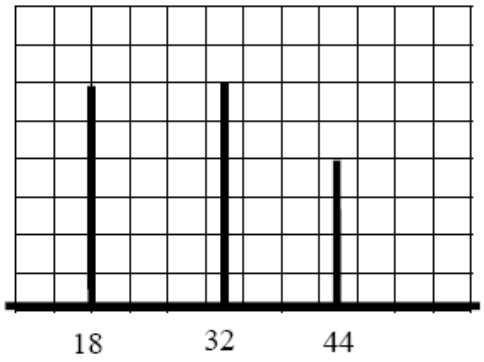
Mass	Molecule
18	
28	
32	
44	

b) Based on the relative intensity of the peaks corresponding to the products of the reaction, determine the empirical formula of the hydrocarbon.

c) What is the molecular formula of the unknown hydrocarbon? Explain.

Video (3)

2.) A pure hydrocarbon sample was combusted in oxygen and the resultant mixture of gases analyzed using mass spectrometry. Which of the following statements about the data is false?



A) All of the hydrocarbon was consumed by the combustion.
B) Oxygen gas was in excess in the reaction.
C) The molar mass of the hydrocarbon is 32.
D) Water is a product of the reaction.
E) Carbon dioxide is a product of the reaction.