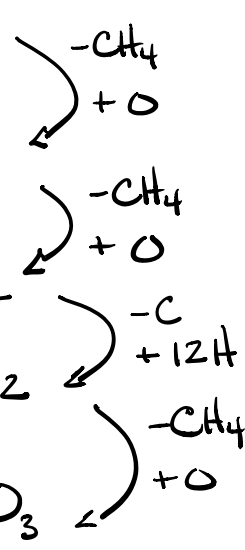
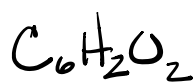


Calculate possible molecular formulas

$M^+ 106$

$$\begin{array}{r} 8 \\ 13 \overline{) 106} \\ \underline{104} \\ 2 \end{array}$$

$$C_8H_{18} = C_8H_{10}$$



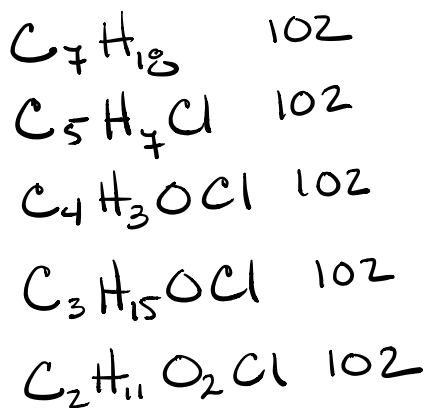
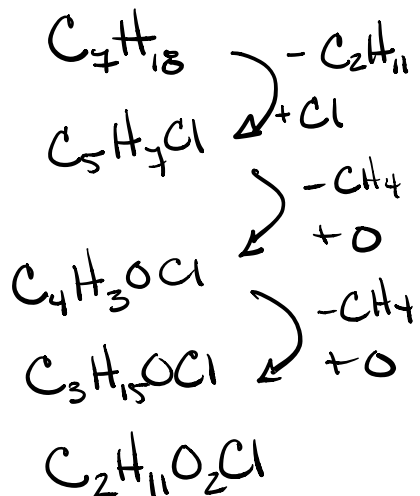
$M^+ 102 \Rightarrow$ assume it has a Cl & one or two oxygens

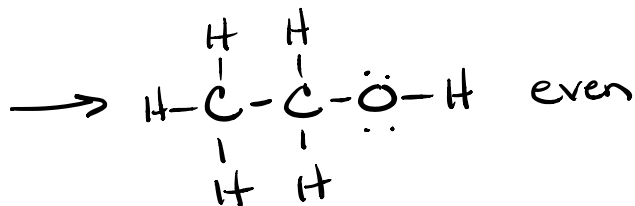
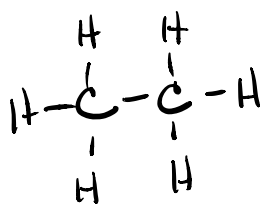
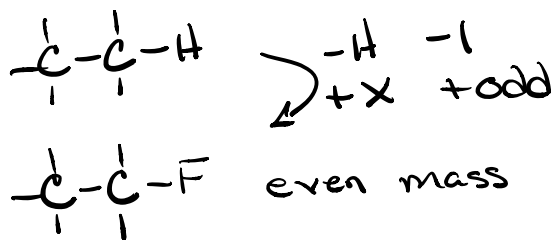
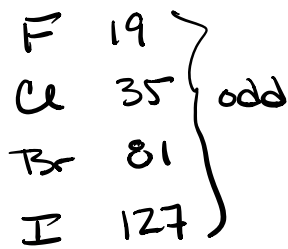
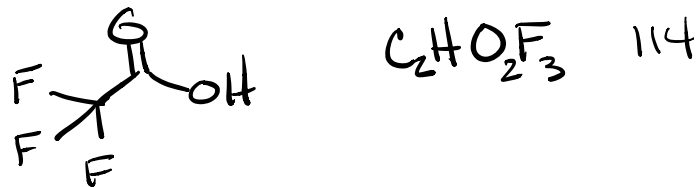
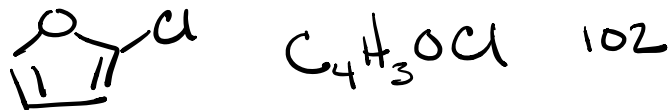
$$\begin{array}{r} 7 \\ 13 \overline{) 102} \\ \underline{91} \\ 11 \end{array}$$

$$Cl = 35 = C_2H_{11}$$

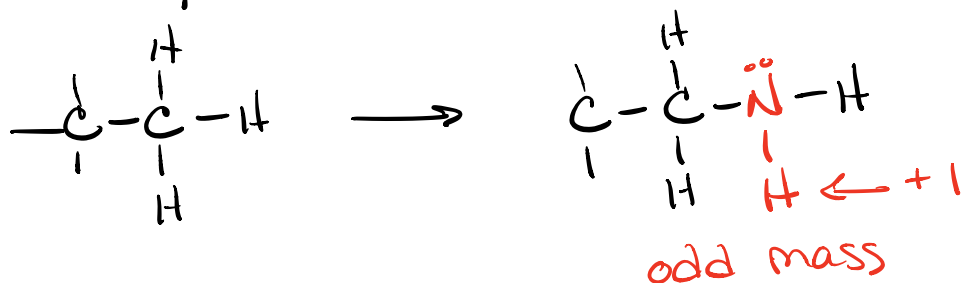
$$\begin{array}{r} 2 \\ 13 \overline{) 35} \\ \underline{-26} \\ 9 \\ C_2H_{11} \end{array}$$

Base formula



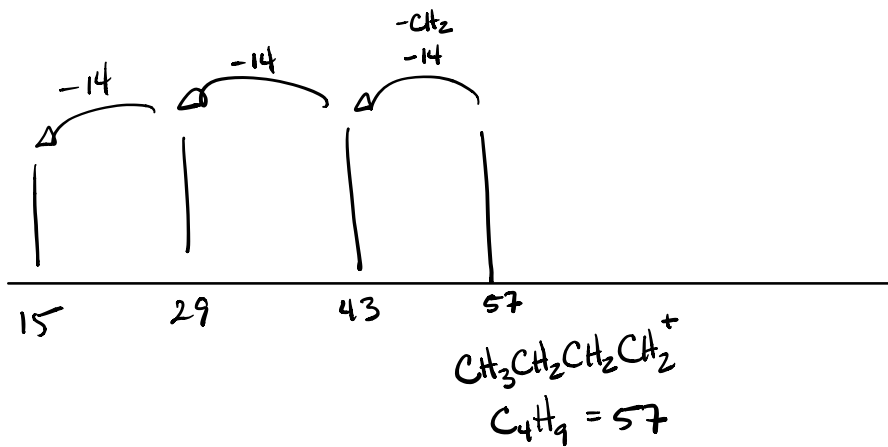


Nitrogen has 3 valencies



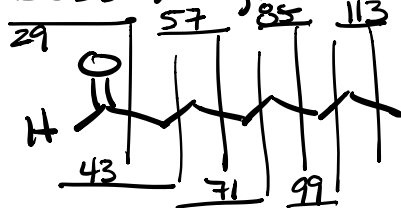
Rare \implies odd # N = odd mass
 odd # P = odd mass

Alkyl Ion Series



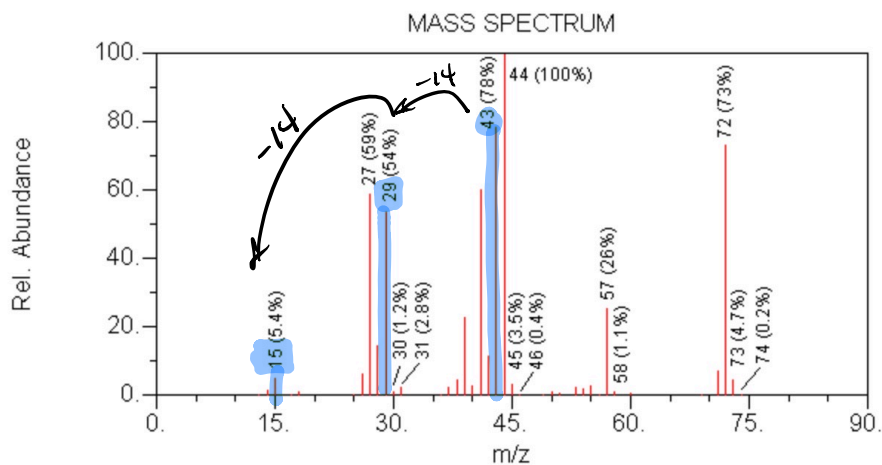
15 29 43 57 71 85

Loss Alkyl Ion Series (Including Oxygen)

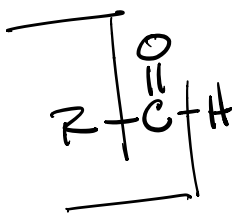
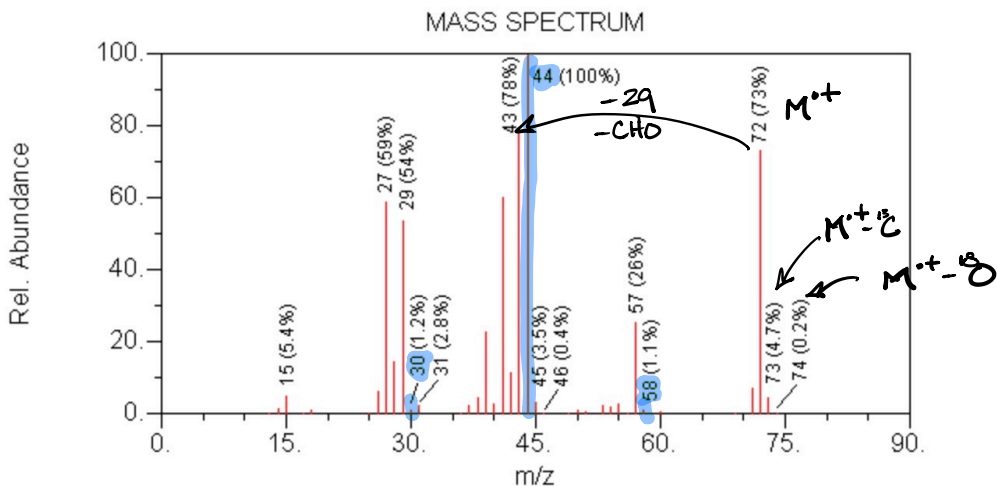


29 43 57 71 85 99 113

Find Alkyl Ion Series

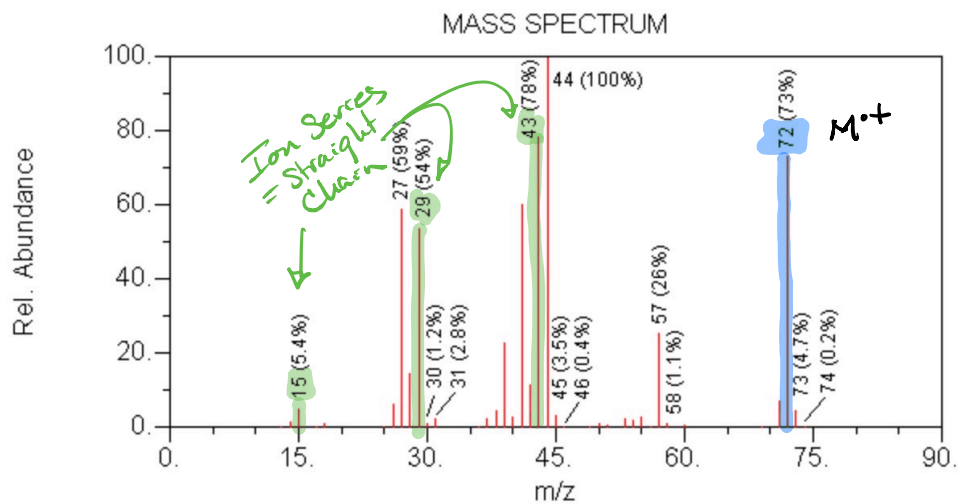


- Find Alkyl loss Series
- 1st Find M^+

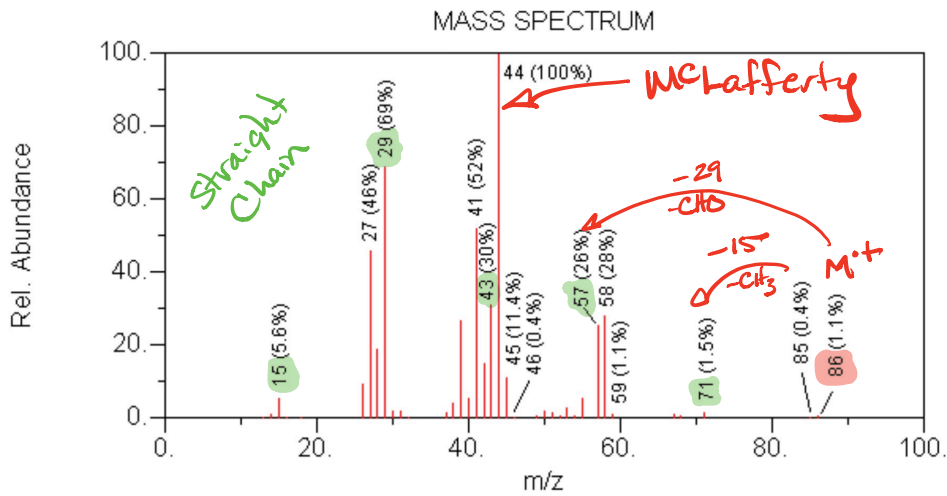


$$\text{CHO} = 2$$

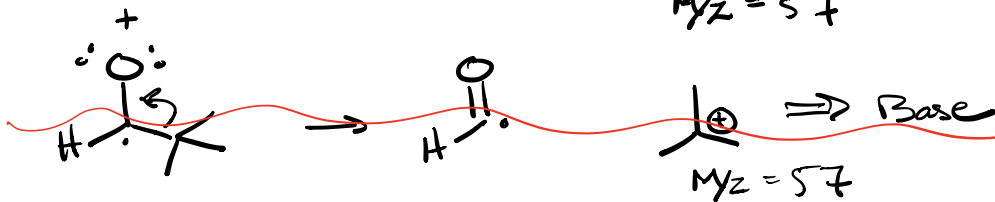
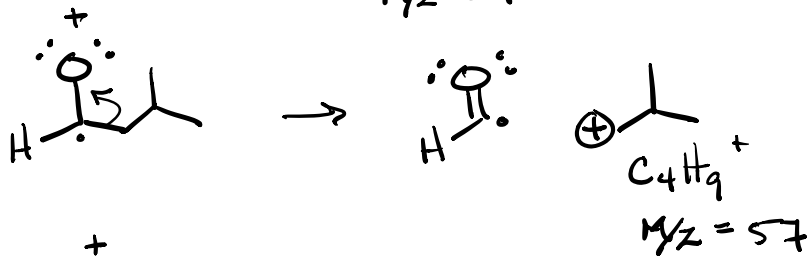
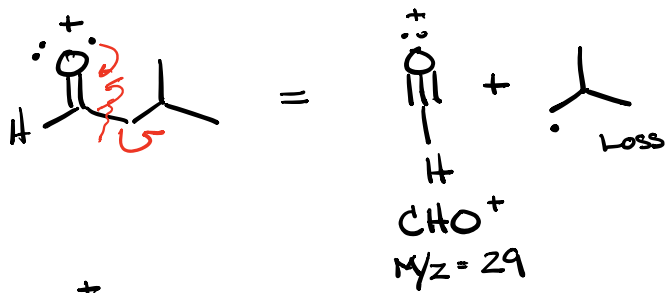
- $M^+ 72 - 15 = 57$ methyl CH_3 (15) First!
 $57 - 14 = 43$ $-\text{CH}_2$ (14)
 $43 - 14 = 29$ $-\text{CH}_2$

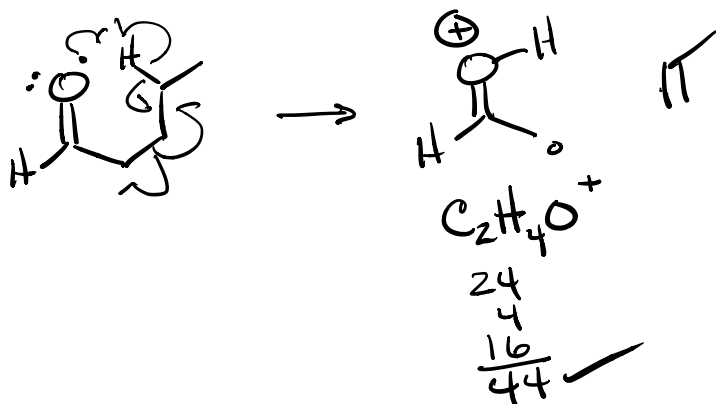
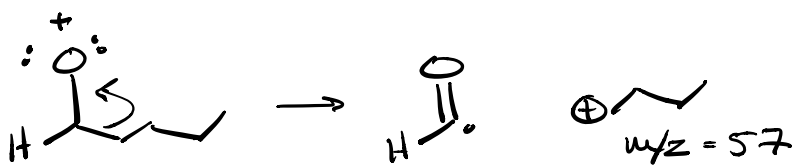


- a) ~~2-propenal~~ CCC=O ~~C_3H_4O 58~~
- b) 2-methyl propanal CC(C)C=O C_4H_8O 72
- c) ~~pentanal~~ CCCCC=O ~~$C_5H_{10}O$ 86~~
- d) 2-oxo-propanal CC(=O)C=O $C_3H_4O_2$ 72
- e) butanal CCCC=O C_4H_8O 72



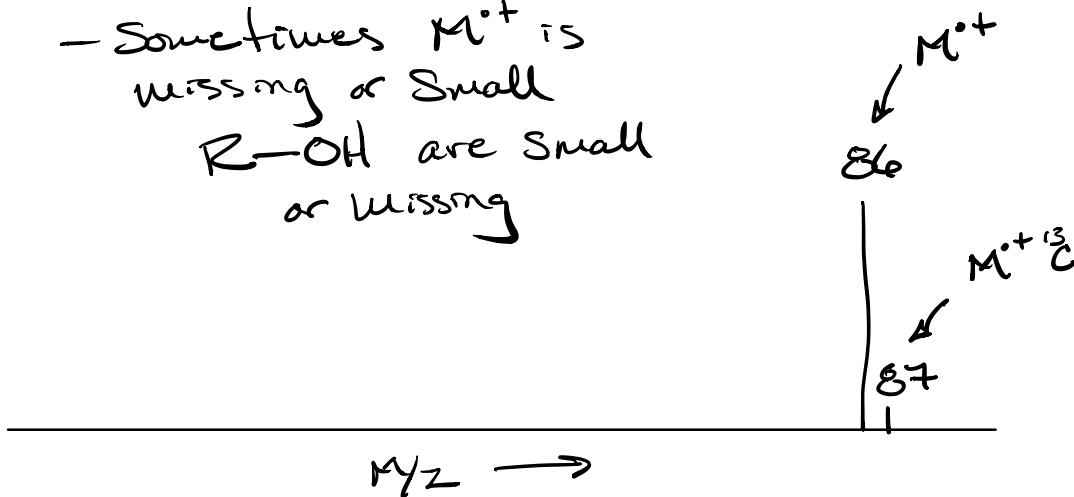
- a) ~~hexanal~~ CCCCC=O $C_6H_{12}O$ 100
- b) 3-methyl butanal CC(C)CC=O $C_5H_{10}O$ 86
- c) pentanal CCCCC=O $C_5H_{10}O$ 86
- d) ~~2-methyl propanal~~ CC(C)C=O C_4H_8O 74
- e) 2,2-dimethyl propanal CC(C)(C)C=O $C_5H_{10}O$ 86

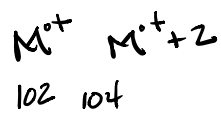
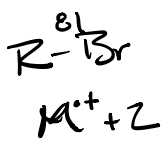




M^+ is the highest m/z less one
 (most of the time)

- Sometimes M^+ is missing or small
 $R-OH$ are small or missing





is it N

87

or R-OH

88

