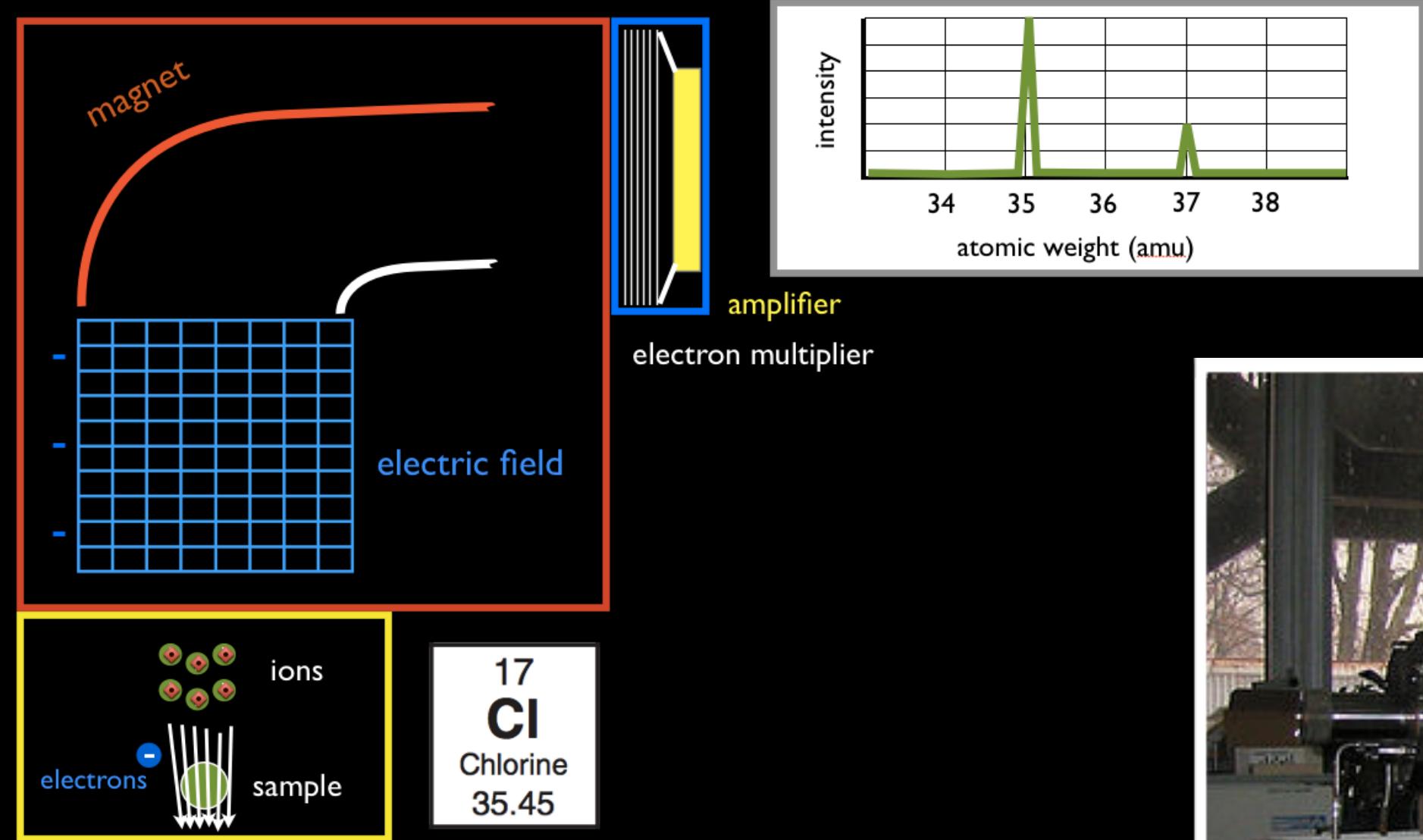


Mass Spectrometry

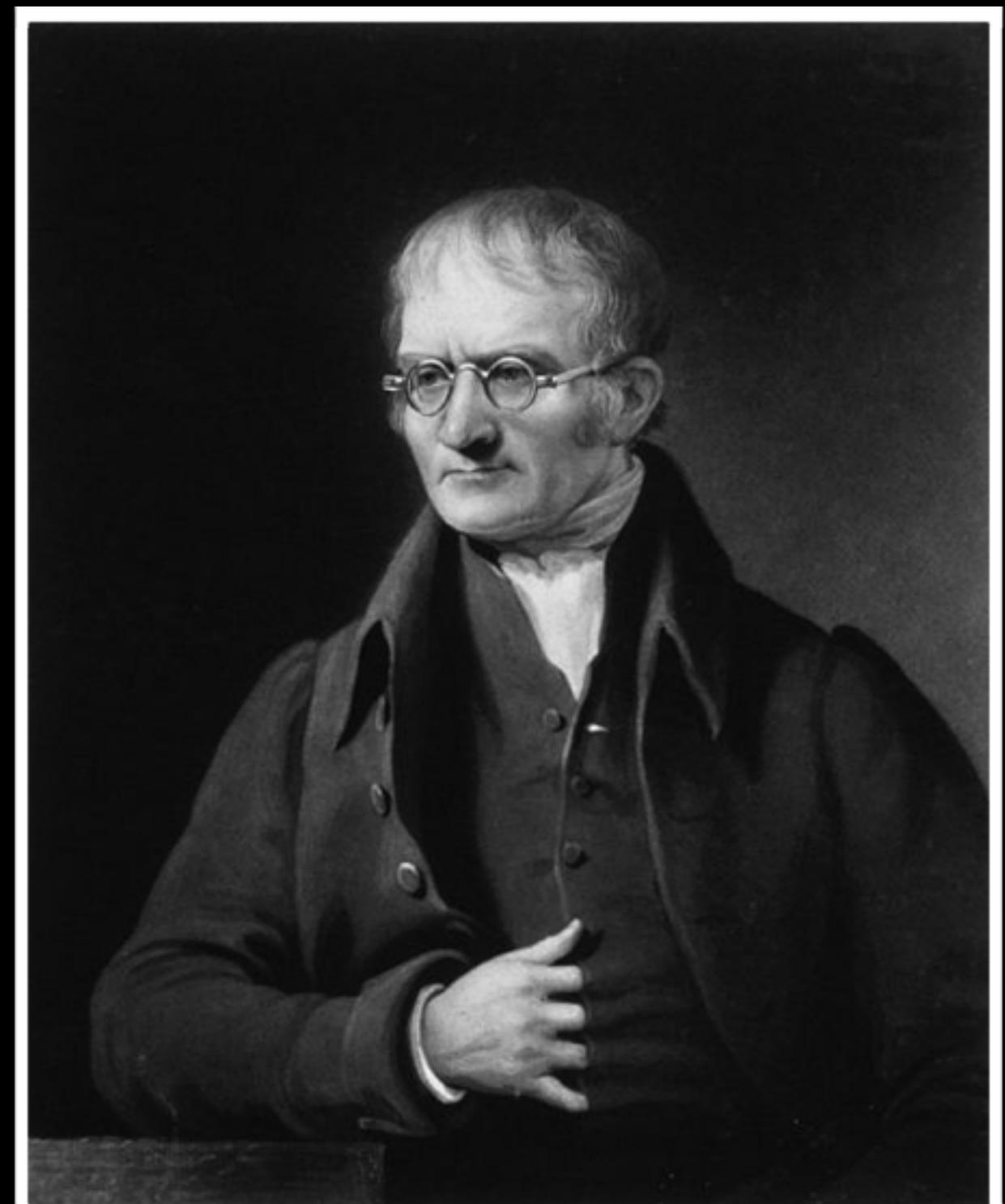


Chemistry Essentials - 009

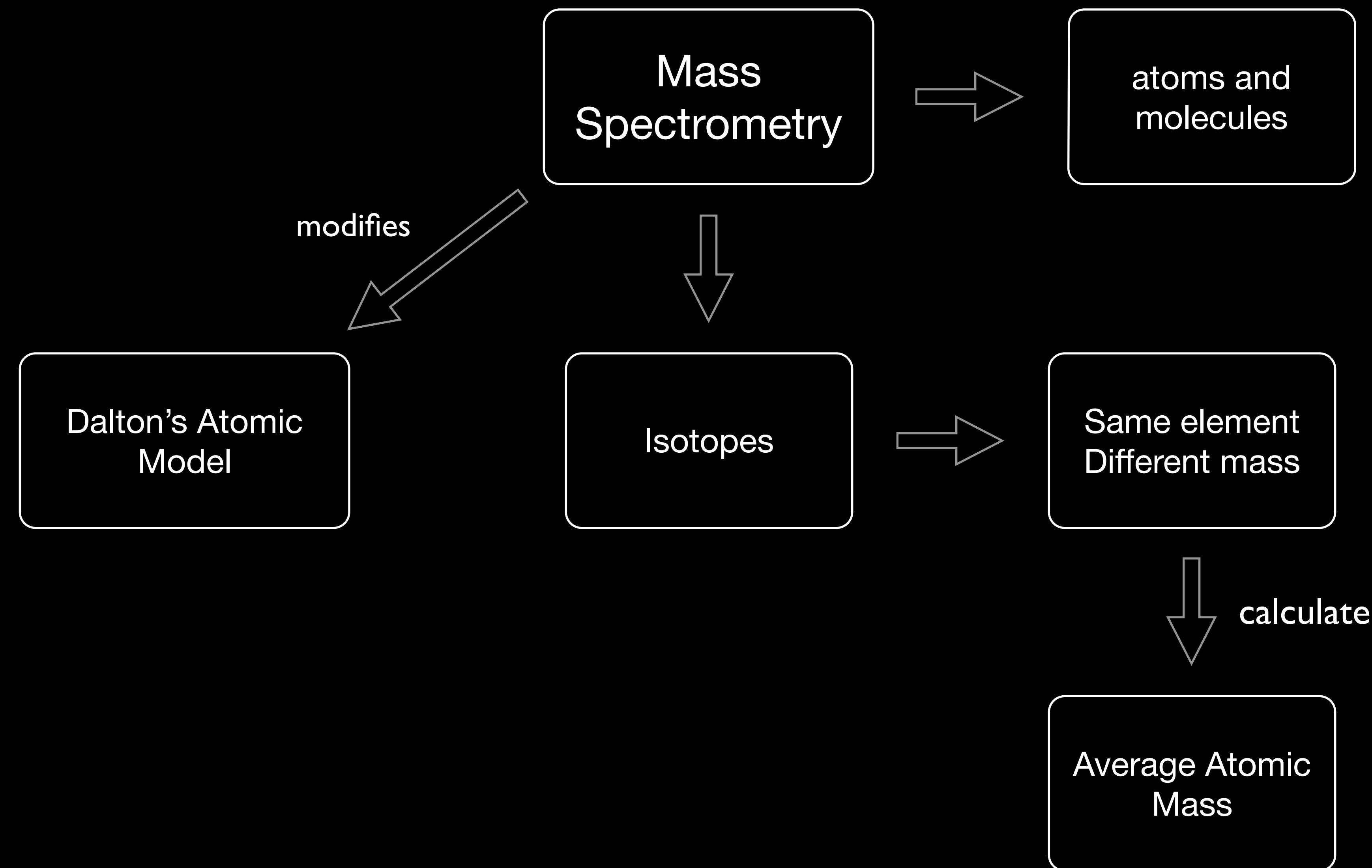
Mass Spectrometry

Dalton's Atomic Theory

1. Elements are made of extremely small particles called atoms.
2. Atoms of a given element are identical in size, mass, and other properties; atoms of different elements differ in size, mass, and other properties.
isotopes
3. Atoms cannot be subdivided, created, or destroyed.
fusion and fission
4. Atoms of different elements combine in simple whole-number ratios to form chemical compounds.
5. In chemical reactions, atoms are combined, separated, or rearranged.



John Dalton

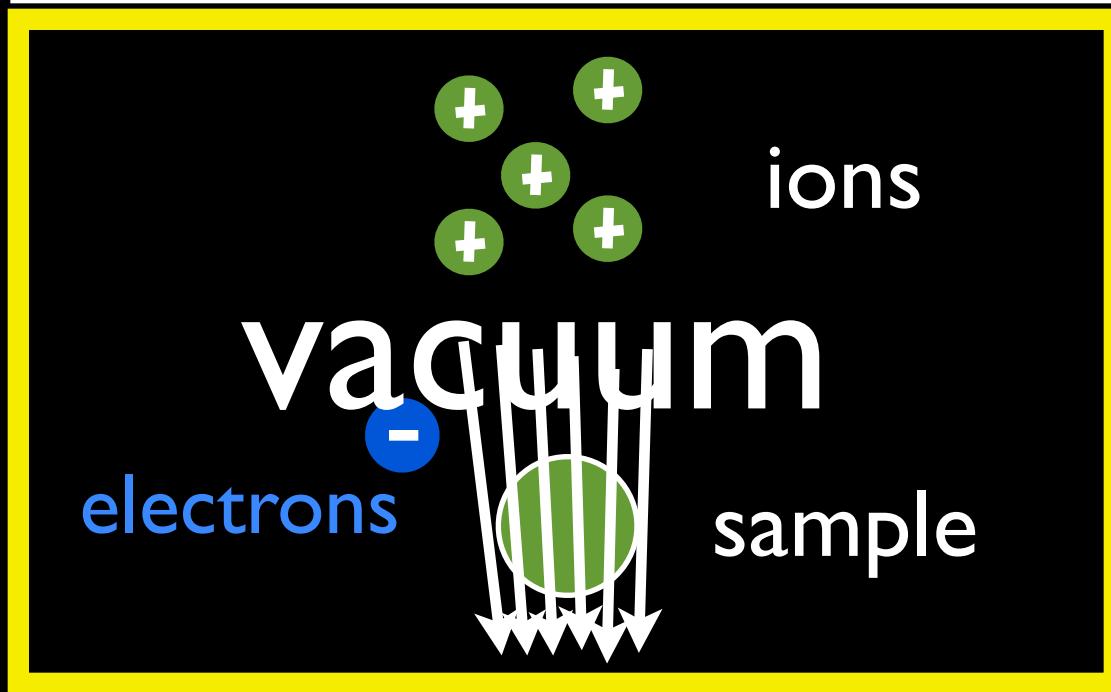


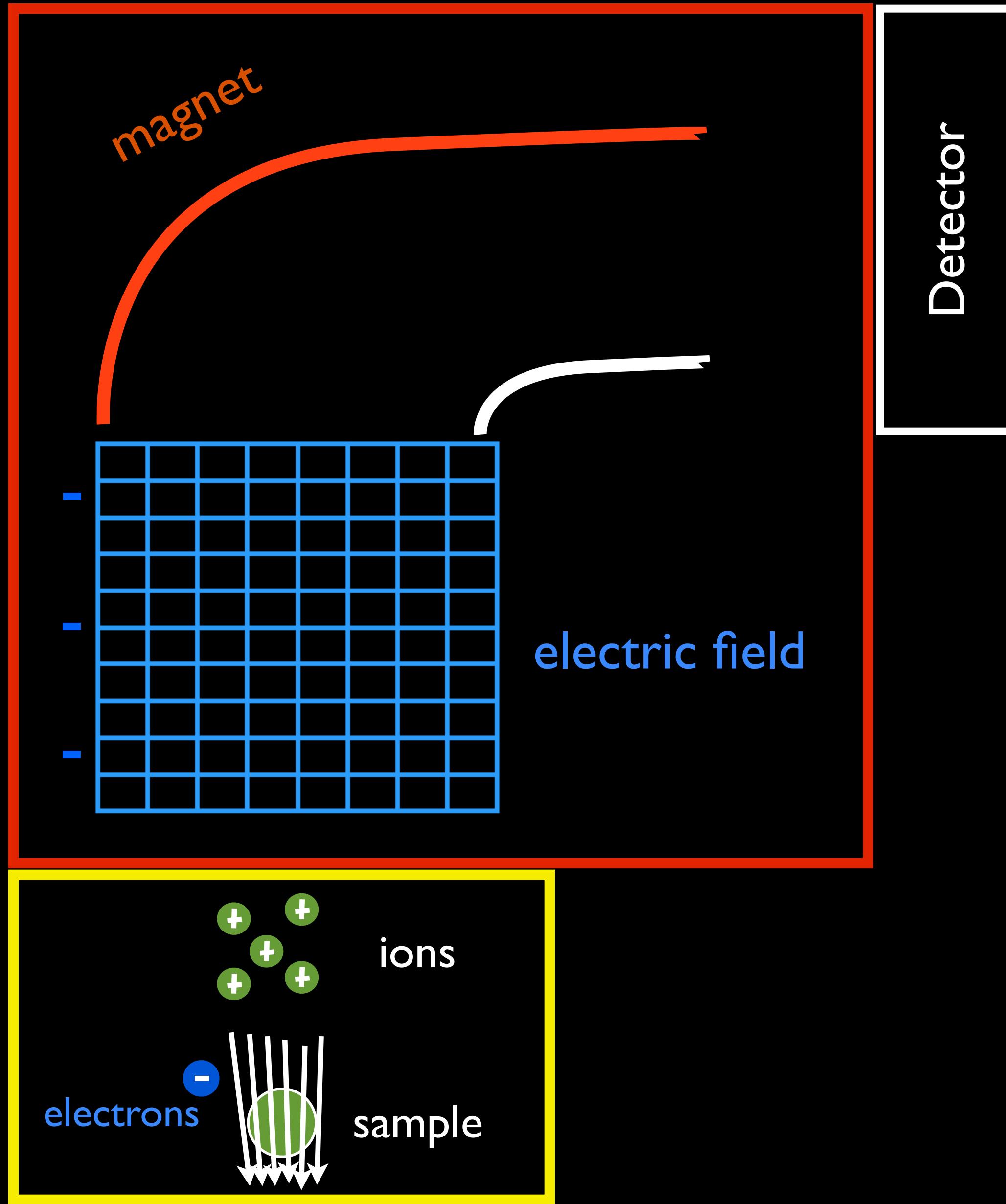
A schematic diagram of a mass spectrometer. It consists of three main rectangular components arranged vertically. The bottom component is labeled "Ionizer". Above it is a larger component labeled "Mass Analyzer". To the right of the Mass Analyzer is a smaller component labeled "Detector". All components are represented by black rectangles with white borders.

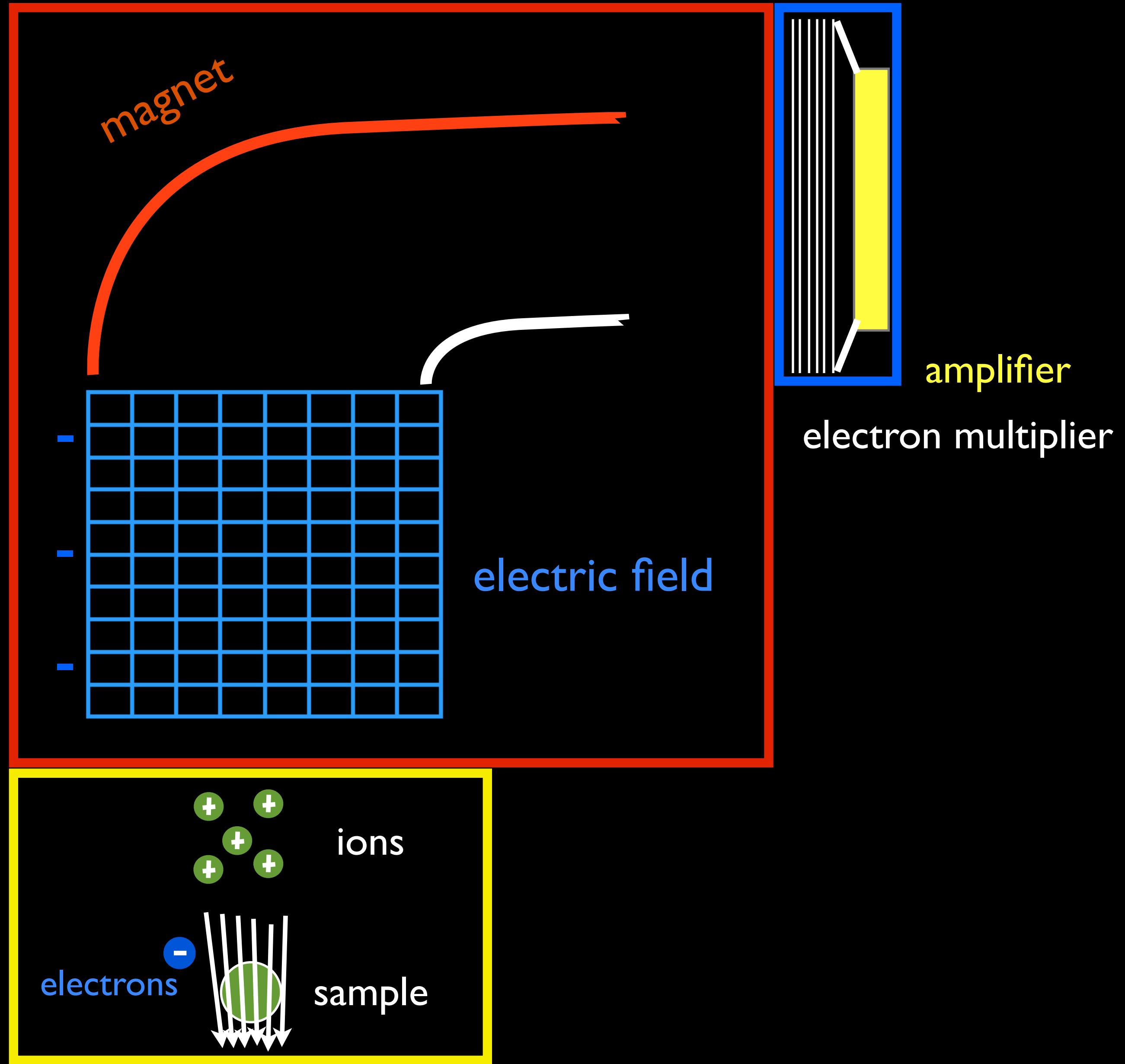
Ionizer

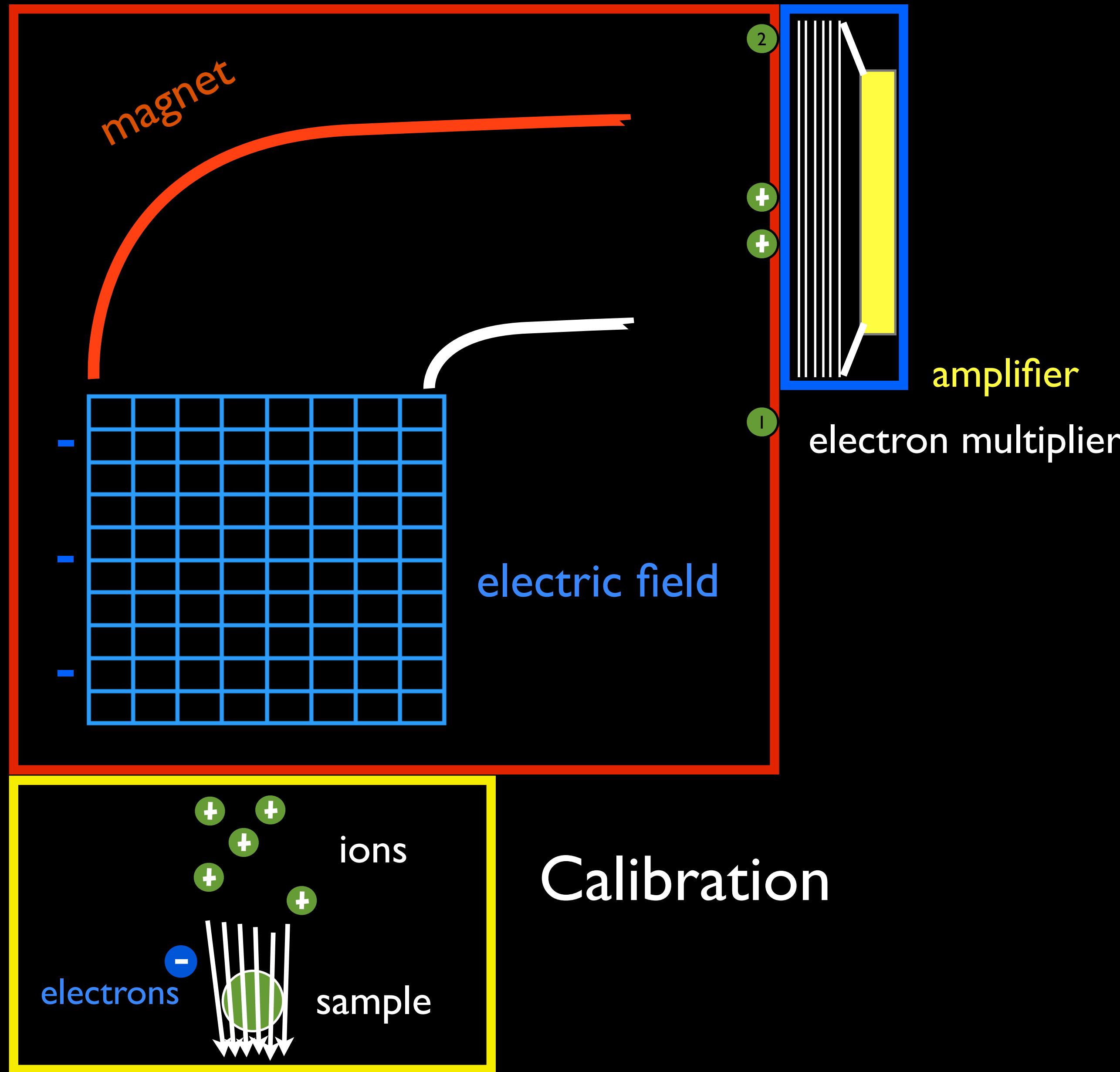
Mass Analyzer

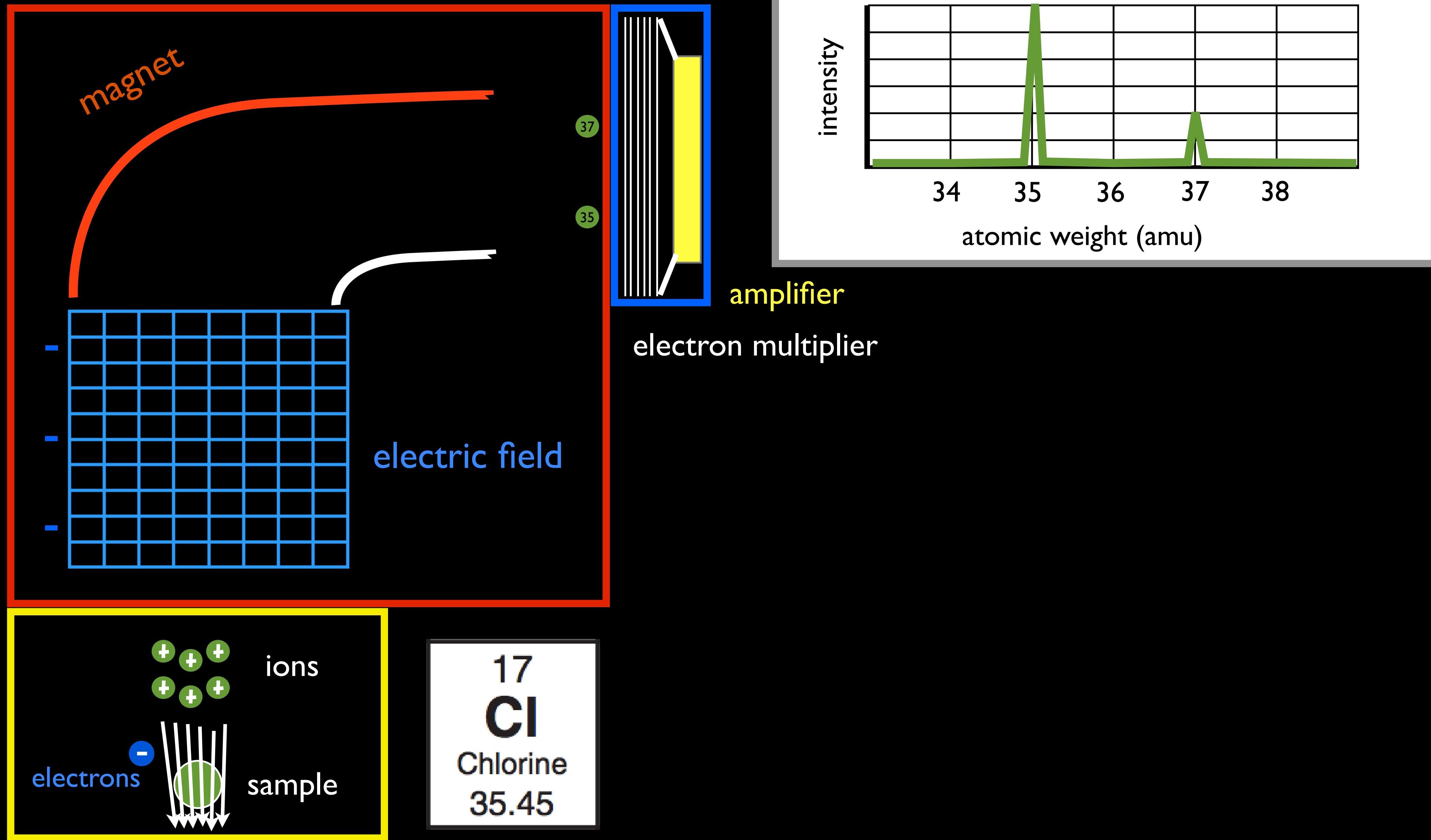
Detector





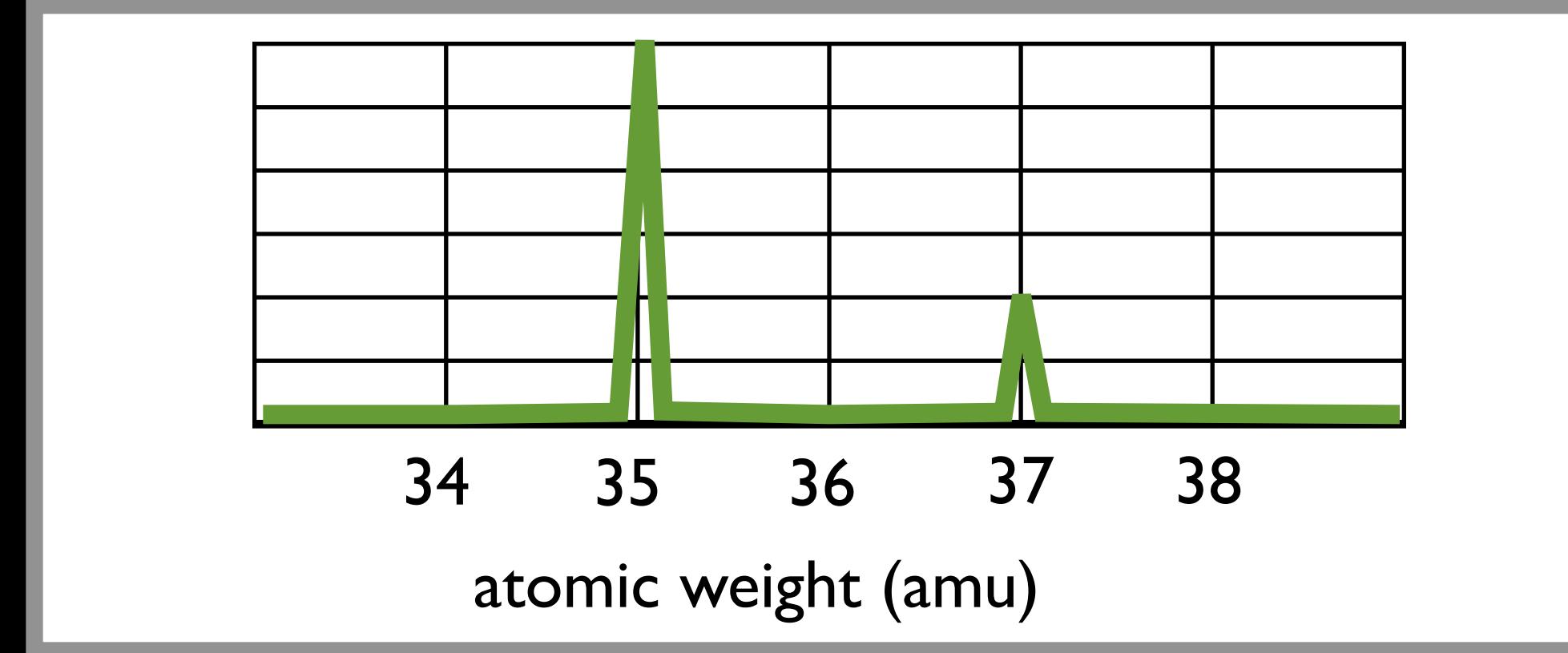






Average Atomic Mass

17
Cl
Chlorine
35.45



Isotope	Mass	Abundance
^{35}Cl	34.96885268(4)	0.7576(10)
^{37}Cl	36.96590259(5)	0.2424(10)

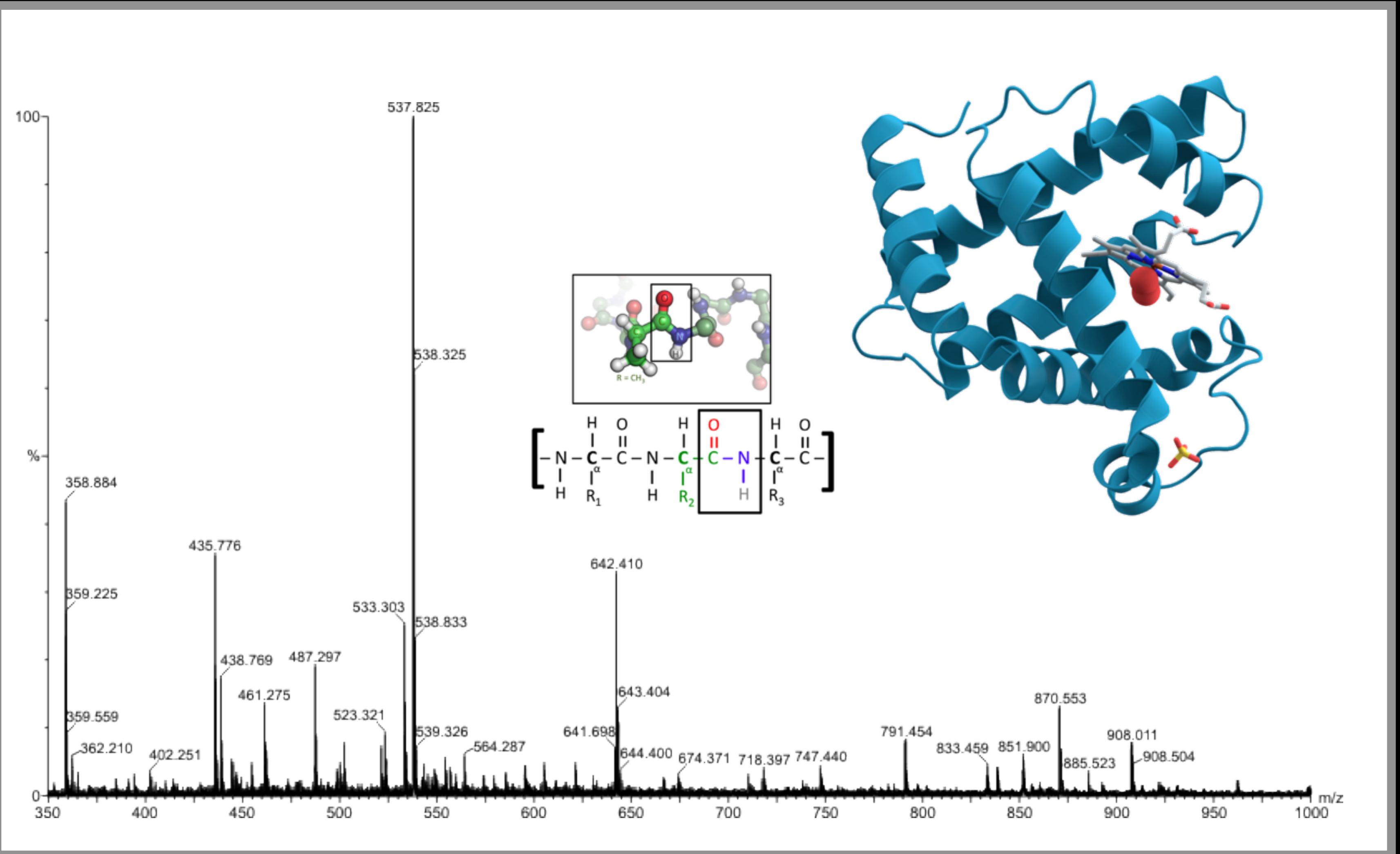
$$\text{atomic weight} = (\text{mass}_a) (\text{abundance}_a) + (\text{mass}_b) (\text{abundance}_b)$$

$$\text{atomic weight} = (34.97) (.7576) + (36.96) (.2424)$$

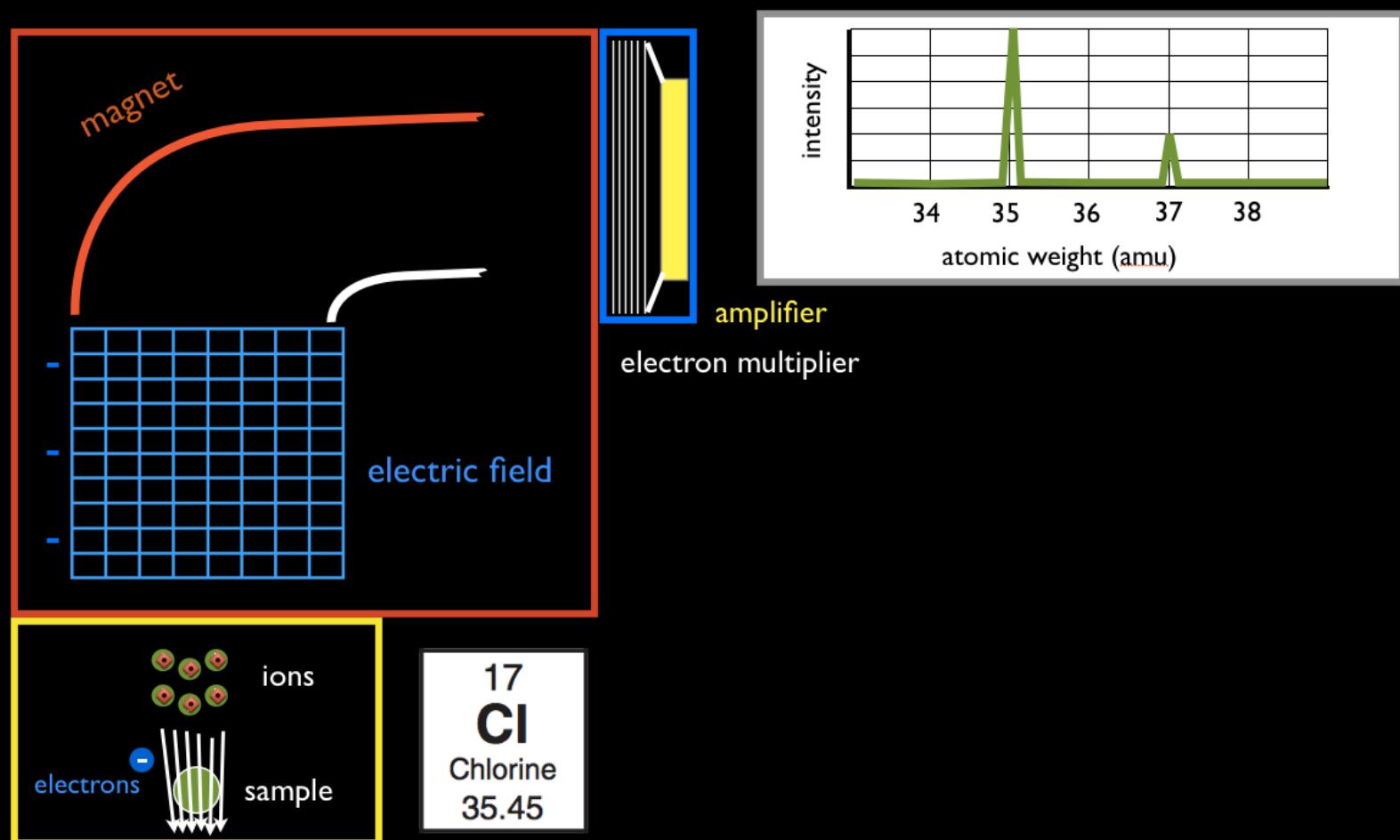
$$\text{atomic weight} = (26.49) + (8.96)$$

$$\text{atomic weight} = 35.45$$

Atoms and Molecules



Did you learn?



How to use data from mass spectrometry
to identify elements and the mass of
individual atoms of an element.

Acknowledgements

“File:John Dalton by Charles Turner.jpg,” August 2, 2013. http://en.wikipedia.org/wiki/File:John_Dalton_by_Charles_Turner.jpg.

“File:Myoglobin.png,” August 5, 2013. <https://en.wikipedia.org/wiki/File:Myoglobin.png>.

“File:Peptide-Figure-Revised.png,” August 5, 2013. <https://en.wikipedia.org/wiki/File:Peptide-Figure-Revised.png>.

File:WidmoMS.gif, n.d. <http://commons.wikimedia.org/wiki/File:WidmoMS.gif>.



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