

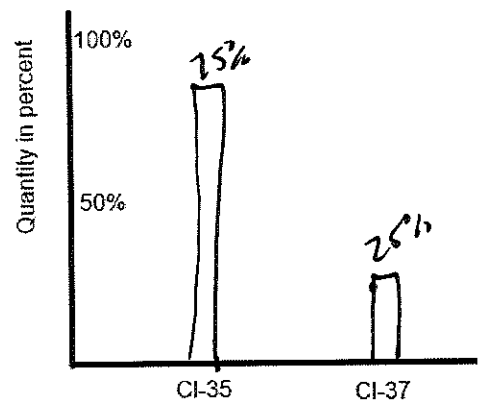
Atomic Nuclear structure

Objective: How and why does and atom aquire mass and charge

1. Aluminum has 44 known isotopes. Although only 1 stable form of aluminum. The term stable meaning it does not undergo radioactive nuclear decay. Al-27 is stable and Al-26 is radioactive with a half life of 105 years.
 - a. If an aluminum atom has 14 neutrons, will it be radioactive? $13 + 14 = 27$ No
 - b. What is the mass number of this atom? 27
 - c. What is the mass number of the most common isotope of aluminum based upon its average atomic mass? 27
 - d. This same Aluminum atom, given the opportunity, will (gain/lose) 3 electrons in nature to form a (cation/anion) with a charge of +3.
 - e. Aluminum is undergoing (oxidation/reduction) as it forms its most common ion.
 - f. Write the reaction of letter of the previous question. $Al \rightarrow Al^{+3} + 3e^{-}$
 - g. (true/false) Aluminum gains protons to become a +3 charge.
 - h. Why is the average atomic mass not on the periodic table?

it is on the table
Mass# is not

2. Chlorine has two very common isotopes that occur in nature. Cl-35 and Cl-37.
 - a. Based upon the average atomic weight of this substance sketch a bar graph below that would provide evidence supporting the average atomic weight.



approximately

b. Student hypothesis: The difference in mass of various isotopes is due to the fact that electrons is specific atoms are easily lost and gained forming cations and anions. Justify/Nullify.

e^{-} almost no mass

- c. Based upon what you know about the structure of the chloride ion,
 - i) How many protons and electros does it have?
 $p^{+17}, 18e^{-}$
 - ii) What charge does it form and why does it form this charge?
-1, full outer shell = stable