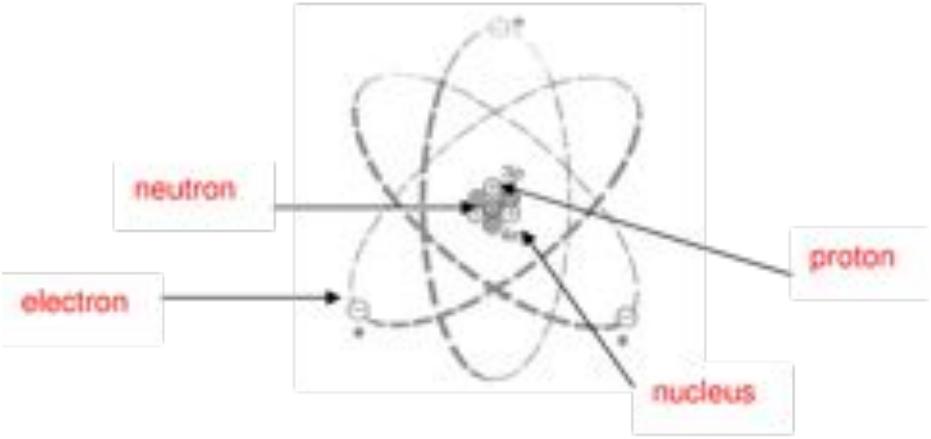
Atomic Structure and Bonding

Set 4: Atoms and Isotopes

answers in red

1. a) Label the parts of the atom shown below.



b) Complete the following using the atom shown.

- Number of protons 3
- Number of neutrons 4
- Number of electrons 3

c) Use a periodic table to identify the element. Li

2. Complete the table below.

Particle	Charge	Mass relative to a proton
Proton	+1	1
Neutron	0	1
electron	-1	1/2000

3. If an electron was removed from an atom:
   - How would it affect the overall mass of the atom? Negligible difference
   - How would it affect the overall charge of the atom? Would have a -1 charge.

4. Isotopes of an element are atoms of the same element and hence have the same number of protons and electrons, but have different numbers of neutrons.

5. Isotopes are regularly represented by the following symbol:

$${}^{A}_{Z}E \qquad \text{Eg.} \; {}^{63}_{29}Cu$$

Where E = element symbol

A = mass number = 63

Z = atomic number = 29

6. Copy and complete the following table.

7. Which element in the table in question 6 is represented by more that

Symbol	Name	Mass No (A)	Atomic No (Z)	No of neutrons
${}^{14}_{6}C$	carbon	14	6	8
${}^{35}_{17}Cl$	chlorine	35	17	18
${}^{56}_{26}Fe$	iron	56	26	30
${}^{31}_{15}P$	phosphorus	31	15	16
${}^{108}_{47}Ag$	silver	108	47	61
${}^{12}_{6}C$	carbon	12	6	6
${}^{23}_{11}Na$	sodium	23	11	12
${}^{64}_{29}Cu$	copper	64	29	35
${}^{40}_{20}Ca$	calcium	40	20	20
${}^{13}_{6}C$	carbon	13	6	7

one isotope? Carbon

8. Use the following format: $^{12}_{6}C$, to rewrite the following isotopes of hydrogen.

a) hydrogen-1 $^{1}_{1}H$

b) hydrogen-2 $^{2}_{1}H$

c) hydrogen-3 $^{3}_{1}H$