

Atomic Structure [S]

1. Draw an atom of sodium, showing the locations and numbers of all of its constituent particles: **[3]**

2. Fill out the following table of the relative charges and masses of subatomic particles: **[6]**

	Relative Mass	Relative Charge
Proton		
Neutron		
Electron		

3. Write the electronic configurations of the following atoms and ions:

a. K **[1]**

b. Si **[1]**

c. N^{3-} **[1]**

d. Mg^{2+} **[1]**

4. Lithium has two naturally occurring isotopes, lithium-6 and lithium-7.

a. Define the term *isotopes*: **[3]**

b. State and explain how the chemistry of these isotopes differs: **[2]**

c. Calculate the relative atomic mass of lithium given: **[3]**

Lithium-6 abundance = 7.5 %

Lithium-7 abundance = 92.5 %

d. Explain how both of these isotopes have the same atomic number: **[2]**

Atomic Structure [S]

1. Draw an atom of sodium, showing the locations and numbers of all of its constituent particles: [3]

11 protons [1]

12 neutrons [1]

11 electrons arranged as 2:8:1 [1]

2. Fill out the following table of the relative charges and masses of subatomic particles: [6]

	Relative Mass	Relative Charge
Proton	1	+1
Neutron	1	0
Electron	1/1840	-1

3. Write the electronic configurations of the following atoms and ions:

a. K [1]

2:8:8:1

b. Si [1]

2:8:4

c. N^{3-} [1]

2:8

d. Mg^{2+} [1] **2:8**

4. Lithium has two naturally occurring isotopes, lithium-6 and lithium-7.

a. Define the term *isotopes*: [3]

atoms with [1] same number of protons [1] but different number of neutrons[1]

b. State and explain how the chemistry of these isotopes differs: [2]

it doesn't [1]

because the number of electrons is the same [1]

c. Calculate the relative atomic mass of lithium given: [3]

Lithium-6 abundance = 7.5 %

Lithium-7 abundance = 92.5 %

$$(0.075*6) + (0.925*7) = 6.93$$

[1] for each bracket

[1] for the answer to either 1 or 2 decimal places

d. Explain how both of these isotopes have the same atomic number: [2]

Atomic number = number of protons [1]

Number of protons is the same [1]