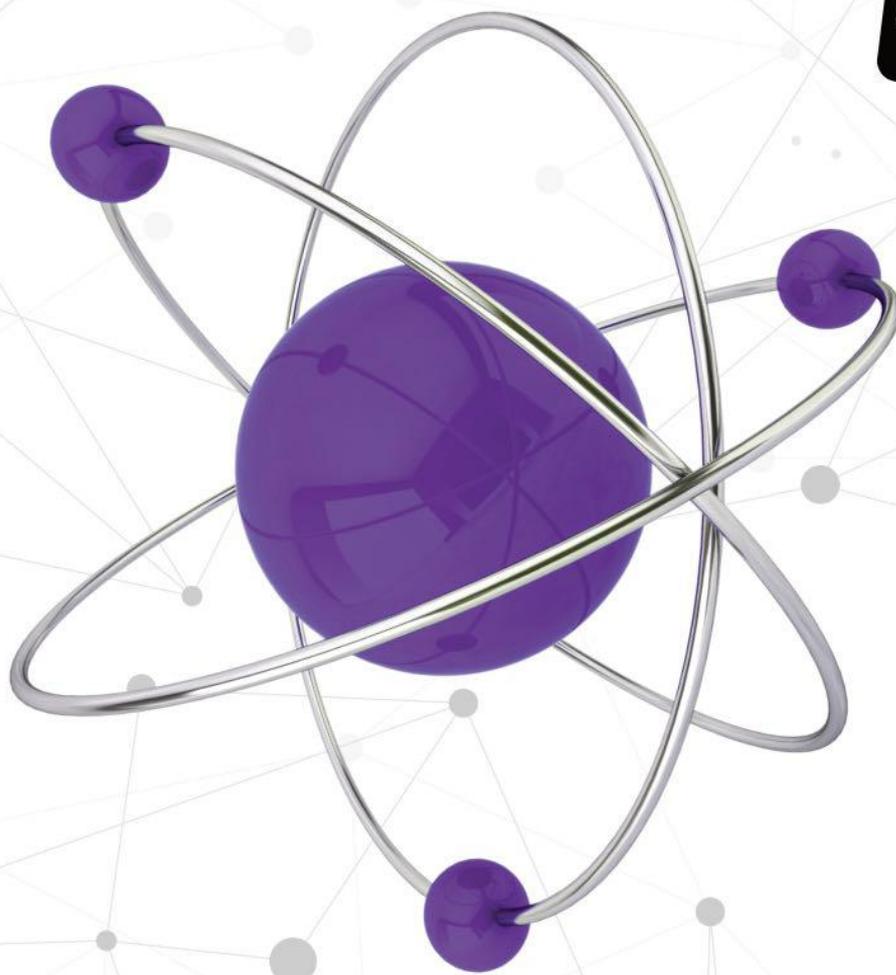


Cambridge IGCSE Chemistry



**2026 - 2028 Syllabus
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Build your answers around the **key terms**



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Paper 6 materials

3.3 Electron Configuration Of Atoms

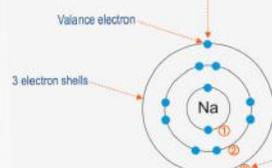
Follow these steps to draw the electron configuration (arrangement) of an atom:

1. Draw the nucleus with the symbol of the element in the centre
2. Draw the number of electron shells according to the period number of the element
3. The number of electrons of the atom = the atomic number
4. Start filling the electrons from the inner shell closest to the nucleus
5. The inner shell can have a maximum of 2 electrons
6. Every other shell can have a maximum of 8 electrons
7. The number of outer shell electrons, also known as valence electrons = the element group number



Video Explanation

Key facts in green



Period	Group 1	Group 2
Period 1	1 H hydrogen 1	
Period 2	3 Li lithium 7	4 Be beryllium 9
Period 3	11 Na sodium 23	12 Mg magnesium 24

Exam tip
If you have been asked to draw the electron configuration of an ion then you have to make sure that you count the right number of electrons. Positive ions have less electrons, while negative ions have extra electrons.
Hani

Exam tips

Important Definition

3.4 Isotopes

Isotopes are atoms of the same element with the same proton number but a different nucleon number

Isotopes are written using their symbol and the mass number (to the upper left) and atomic number (to the lower left); for instance, the sodium (Na) isotope is written as $^{23}_{11}\text{Na}$

There are two types of isotopes:

- Radioactive** (or **radioisotopes**) isotopes are atoms of the same element with different masses whose nuclei release radiation because they are unstable
- Non-radioactive** isotopes are atoms of the same element with different masses and stable nuclei

The similarities and differences between isotopes are summarised in this table:

Property Of Isotope	Similar Property	Different Property
Number of protons	✓	✗
Number of electrons	✓	✗
Number of neutrons	✗	✓
Atomic number	✓	✗
Mass number	✗	✓
Chemical property	✓	✗



Extended syllabus

Key terms in Pink

3.5 Using Isotopes

Isotopes have similar chemical properties because they have the same number of valence electrons

Isotopes have two major applications:

- Medical uses:** killing cancer cells and sterilising medical equipment
- Industrial uses:** uranium - 235 is used to generate electricity in a nuclear power station

16

Mark scheme points

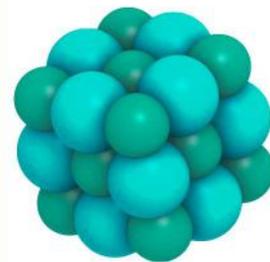
01

CHAPTER 1
MATTER



05

CHAPTER 2
METHODS OF
PURIFICATION



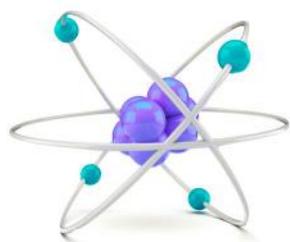
15

CHAPTER 3
ATOMIC
STRUCTURE

17

CHAPTER 4
IONIC BONDING

Table of



21

CHAPTER 5
COVALENT
BONDING

24

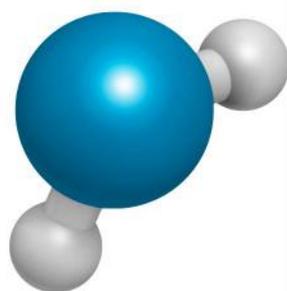
CHAPTER 6
METALLIC
BONDING

27

CHAPTER 7
STOICHIOMETRY

31

CHAPTER 8
THE MOLE
CONCEPT



37

CHAPTER 9
REDOX

40

CHAPTER 10
ELECTRICITY
& CHEMISTRY

45

CHAPTER 11
ENERGETICS

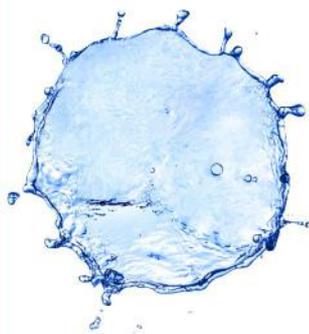
49

CHAPTER 12
RATE OF
REACTION



54

CHAPTER 13
REVERSIBLE
REACTIONS



55

CHAPTER 14
EQUILIBRIUM



Contents



58

CHAPTER 15
ACIDS &
BASES

64

CHAPTER 16
IDENTIFICATION
OF IONS



68

CHAPTER 17
THE PERIODIC
TABLE

71

CHAPTER 18
METALS

76

CHAPTER 19
WATER

77

CHAPTER 20
AIR QUALITY
& CLIMATE



82

CHAPTER 21
SULFUR AND
CARBONATES



83

CHAPTER 22
ORGANIC
CHEMISTRY

93

CHAPTER 23
POLYMERS

97

CHAPTER 24
PAPER &
PREPARATION



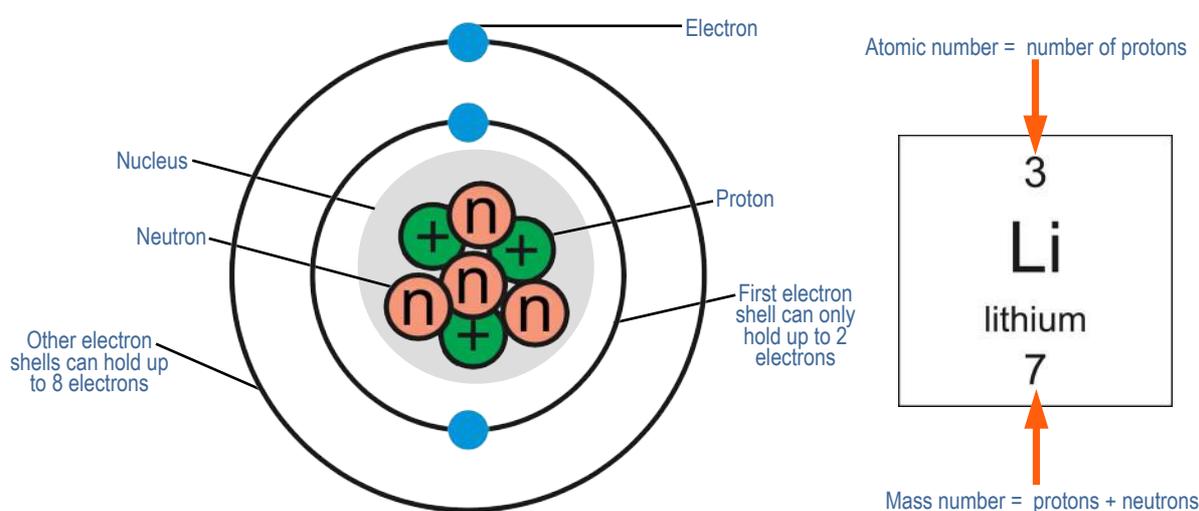
Atomic Structure



3.1 The Subatomic Particles

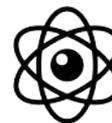
- ✧ The atom is the smallest component of an element
- ✧ The atom is made of two main regions: **the nucleus** in the centre and **electron shells** around
- ✧ Atoms are made of three smaller components, also known as **subatomic particles**

Subatomic Particle	Symbol	Charge	Mass	Location
Proton	H ⁺	1+	1	Nucleus
Neutron	n ⁰	0	1	Nucleus
Electron	e ⁻	1-	Negligible (almost zero)	Electron shells



3.2 Atomic Structure Rules

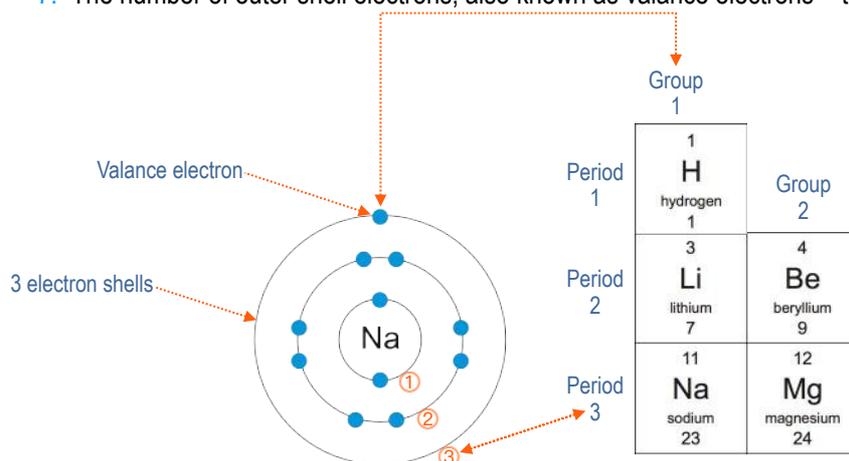
- ✧ Atoms have no net charge or neutral because **the number of protons = the number of electrons**
- ✧ **The number of protons in the atom = the atomic number** of the element in the Periodic Table
- ✧ **Element:** a substance made of atoms with the same atomic number
- ✧ The number of protons of the element never changes; it determines the identity of the element
- ✧ **Elements in the Periodic Table are organised by their atomic numbers**
- ✧ The number of protons + neutrons = the mass number (also known as the **nucleon number**)
- ✧ The number of neutrons could change for the same element, and so is the mass (nucleon) number
- ✧ Atoms that have **the same proton number but different number of neutrons are called isotopes** (page: 16)
- ✧ The number of electrons does change; atoms with more or fewer electrons than protons are called **ions**
- ✧ Atoms that have more electrons than protons are negative ions also called **anions**
- ✧ Atoms that have fewer electrons than protons are positive ions also called **cations**
- ✧ **Electrons start filling the inner shell from the nucleus first**; this shell can have 1 or 2 electrons
- ✧ Every other shell in the atom can have a maximum of 8 electrons
- ✧ Outer shell electrons are called valence electrons
- ✧ **The number of valence electrons = the group number**
- ✧ **Example:** the element lithium (Li), in the diagram, has two electron shells and one outer shell electron; therefore, lithium is found in period 2 and group 1



3.3 Electron Configuration Of Atoms

Follow these steps to draw the electron configuration (arrangement) of an atom:

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Exam tip

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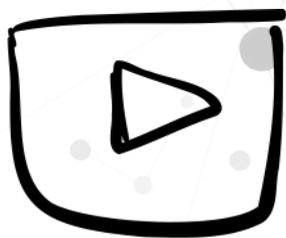
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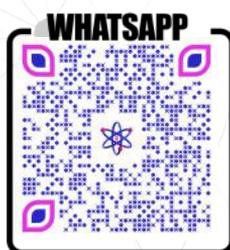
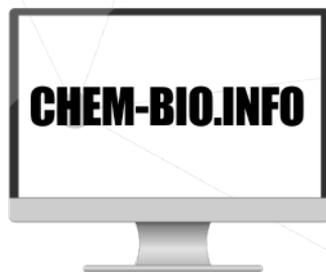
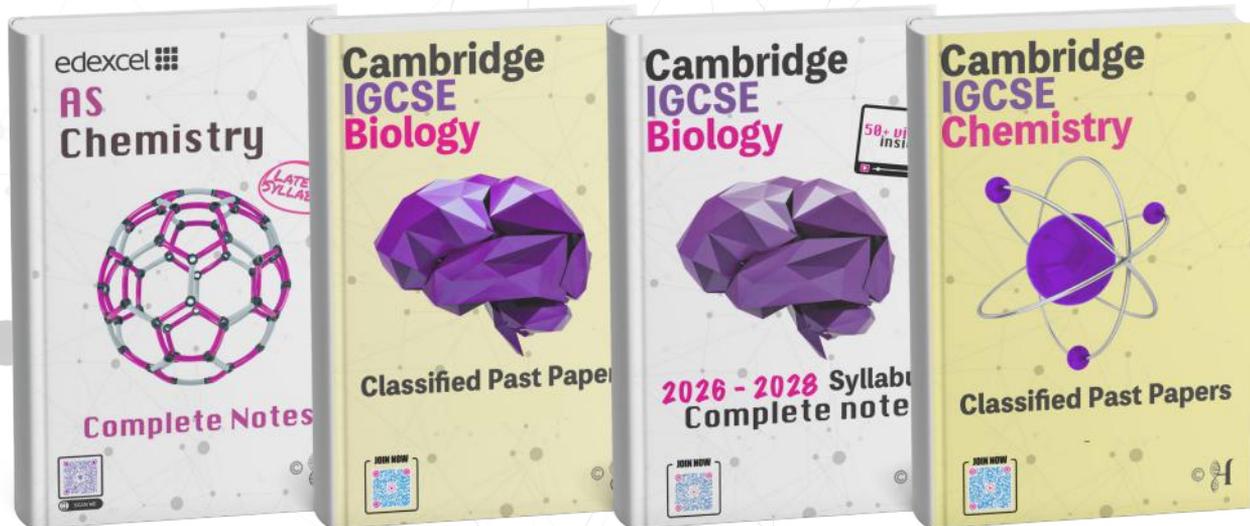
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