Periodic Table

A Level

Part A Tin

Which block of the periodic table contains the element tin?

- s
- p
- d
- f

Part B Ytterbium

Which block of the periodic table contains the element ytterbium?

- s
- p
- d
- f

Part C Lithium

Select the correct statement about lithium.

- Lithium is in period 2 of the periodic table.
- Lithium has two protons in its nucleus.
- Lithium has an atomic number of 2.
- Lithium is in group 2 of the periodic table.

Part D Phosphorus and antimony

Select the correct statement.

- Phosphorus and antimony are neither in the same group nor in the same period as each other.
- Phosphorus and antimony are in the same group as each other.
- Phosphorus and antimony are both in the same group and in the same period as each other.
- Phosphorus and antimony are in the same period as each other.

Part E Groups

Select the correct general statement.

- Elements in the same group have the same number of valence electrons, but can have different reactivities and atomic radii.
- Elements in the same group do not have the same number of valence electrons.
- Elements in the same group have the same number of valence electrons and therefore have the same atomic radius.
- Elements in the same group have the same number of valence electrons and are therefore equally reactive.

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Electron configurations (D1.1)

A Level

Complete the following ground state electron configurations.

Part A Be

What is the ground-state electron configuration of Be?

Items:

1s 2s 3s 4s 2p 3p 1 2 3 4

Part B N

What is the ground-state electron configuration of N?

Items:

1s 2s 3s 4s 2p 3p 1 2 3 4

Part C Ne

What is the ground-state electron configuration of Ne?

Items:

$1s$	$2s$	$3s$	$4s$	$2p$	$3p$	1	2	3	4	5	6

Based on question D1.1 from Physical Chemistry book

Electron configurations (D1.4)

A Level

Complete the following ground state electron configurations.

Part A H^{-}

What is the ground-state electron configuration of H^{-}?

Items:

1s 2s 3s 2p 0 1 2 3

Part B O^{2-}

What is the ground-state electron configuration of O^{2-}?

Items:

1s 2s 3s 2p 3p 1 2 4 5 6

Part C Na^{+}

What is the ground-state electron configuration of Na^{+}?

Items:

1s | 2s | 3s | 2p | 3p | 1 | 2 | 4 | 5 | 6

Part D Al^{3+}

What is the ground-state electron configuration of Al^{3+}?

Items:

1s | 2s | 3s | 2p | 3p | 1 | 2 | 4 | 5 | 6

Based on question D1.4 from Physical Chemistry book

Essential Pre-Uni Chemistry D4.2

GCSE A Level

	ISOTOPE	# PROTONS	# NEUTRONS
Part A	Carbon-12		6
Part B	Carbon-13		
Part C	Technetium-99	43	
Part D	Iodine-131		
Part E	Polonium-210		
Part F	Uranium-233		
Part G	Rutherfordium-260		

Complete the table to show the numbers of protons and neutrons in each isotope.

Part A Carbon-12

Number of protons

Part B Carbon-13

Number of protons

Number of neutrons

Part C Technetium-99

Number of neutrons

Part D Iodine-131

Number of protons

Number of neutrons

Part E Polonium-210

Number of protons

Number of neutrons

Part F Uranium-233

Number of protons

Number of neutrons

Number of protons

Number of neutrons

Essential Pre-Uni Chemistry D4.1

GCSE A Level

Name the isotopes with the following numbers of protons and neutrons in their nuclei, e.g. 2 protons and 2 neutrons gives the answer helium-4.

Part A 1 proton and 2 neutrons.

1 proton and 2 neutrons.

- hydrogen-2
- lithium-3
- hydrogen-3
- helium-3

Part B 5 protons and 6 neutrons.

5 protons and 6 neutrons.

- boron-6
- carbon-11
- beryllium-11
- boron-11

Part C **15 protons and 16 neutrons.**

15 protons and 16 neutrons.

- phosphorus-31
- sulfur-31
- phosphorus-32
- silicon-32

Part D **18 protons and 22 neutrons.**

18 protons and 22 neutrons.

- potassium-40
- argon-22
- argon-40
- chlorine-40

Part E **27 protons and 33 neutrons.**

27 protons and 33 neutrons.

- copper-61
- cobalt-60
- zinc-59
- iron-60

Part F **35 protons and 44 neutrons.**

35 protons and 44 neutrons.

- bromine-89
- bromine-79
- bromine-69
- selenium-79

Part G **38 protons and 52 neutrons**

38 protons and 52 neutrons

- strontium-90
- rubidium-38
- strontium-52
- yttrium-80

Part H **55 protons and 82 neutrons.**

55 protons and 82 neutrons.

- caesium-137
- caesium-82
- barium-137
- barium-82

Part I **90 protons and 142 neutrons.**

90 protons and 142 neutrons.

- actinium-232
- thorium-232
- thorium-142
- actinium-90

Part J **95 protons and 146 neutrons.**

95 protons and 146 neutrons.

- americium-95
- americium-241
- plutonium-241
- curium-241

Essential Pre-Uni Chemistry D1.7

A Level

Give the chemical symbols for the atoms with the following ground state electron configurations:

Part A $[\mathrm{Ne}]\ 3s^1$

$[\mathrm{Ne}]\ 3s^1$

Part B $[\mathrm{Ar}]\ 3d^5\ 4s^2$

$[\mathrm{Ar}]\ 3d^5\ 4s^2$

Part C $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^8\ 4s^2$

$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^8\ 4s^2$

Part D $[\mathrm{Ar}]\ 3d^{10}\ 4s^2$

$[\mathrm{Ar}]\ 3d^{10}\ 4s^2$

Part E $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^2\ 4p^6\ 4d^{10}\ 4f^{14}\ 5s^2\ 5p^6\ 5d^{10}\ 6s^2\ 6p^5$

$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^2\ 4p^6\ 4d^{10}\ 4f^{14}\ 5s^2\ 5p^6\ 5d^{10}\ 6s^2\ 6p^5$

Essential Pre-Uni Chemistry D4.3

GCSE C C C A Level P P P

	SYMBOL	# PROTONS	# NEUTRONS	# ELECTRONS
Part A	$^{23}_{11}\mathrm{Na}$		12	
Part B	$^{40}_{19}\mathrm{K}$			
Part C	$^{25}_{12}\mathrm{Mg}^{2+}$	12		
Part D	$^{81}_{35}\mathrm{Br}^{-}$			
Part E	$^{58}_{26}\mathrm{Fe}^{3+}$			
Part F	$^{18}_{8}\mathrm{O}^{2-}$			
Part G	$^{206}_{82}\mathbf{?}$			82
Part H	$^{239}_{93}\mathbf{?}$			93

Complete the table by filling any blank cell and any missing symbol indicated by a '**?**'.

Part A $^{23}_{11}\mathrm{Na}$

Number of protons

Number of electrons

Part B $^{40}_{19}\mathrm{K}$

Number of protons

Number of neutrons

Number of electrons

Part C $^{25}_{12}\mathrm{Mg}^{2+}$

Number of neutrons

Number of electrons

Part D $^{81}_{35}\mathrm{Br}^{-}$

Number of protons

Number of neutrons

Number of electrons

Part E $^{58}_{26}\mathrm{Fe}^{3+}$

Number of protons

Number of neutrons

Number of electrons

Part F $^{18}_{8}\mathrm{O}^{2-}$

Number of protons

Number of neutrons

Number of electrons

Part G $^{206}_{82}\mathbf{?}$

What is the element symbol corresponding to the question mark?

Number of protons

Number of neutrons

Part H $^{239}_{93}?$

What is the element symbol corresponding to the question mark?

Number of protons

Number of neutrons

Essential Pre-Uni Chemistry D1.8

A Level

An ion of nickel is found to have the ground state electron configuration $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^7$ in the gas phase.

Give the numerical charge on the ion as an integer. Remember to include the appropriate sign in your answer (as $\pm N$ and **not** $N\pm$).

Electron Configuration

A Level

A species Z has the following electron configuration:

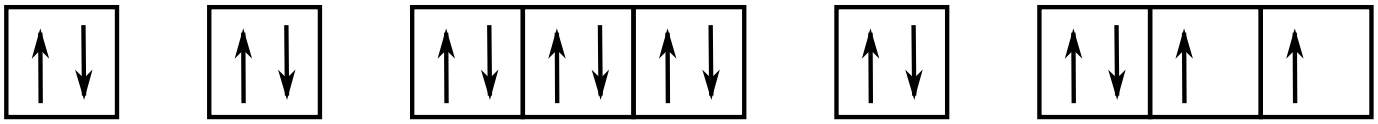

Figure 1: Electron configuration of Z

What could Z be?

1	2	3
Cl^{+} ion	S atom	Ar^{2-} ion

- **1** only is possible
- **2** only is possible
- **3** only is possible
- **1** and **2** only are possible
- **1** and **3** only are possible
- **2** and **3** only are possible
- **1**, **2** and **3** are possible
- None are possible

Adapted with permission from UCLES, A Level Chemistry, November 1996, Paper 4, Question 31