

1. Atomic structure

Starter Quiz · 课前小测

A-Level Chemistry

Name: _____ Score: _____

1. A proton has a relative charge of +1 and a neutron has no charge.
☐ True ☐ False
2. A positive ion (cation) is smaller than its parent atom.
☐ True ☐ False
3. Isotopes of an element have:
☐ the same number of protons but a different number of neutrons
☐ a different number of protons
☐ a different number of electrons
☐ the same number of neutrons
4. The electron configuration of sodium (11 electrons) is $1s^2 2s^2 2p^6$ _____.

5. Each orbital can hold a maximum of two electrons, which must have opposite spins.
☐ True ☐ False
6. Why are gaseous atoms specified in the definition of ionisation energy?
☐ so there are no forces between the particles
☐ because gases are cheaper
☐ so the atoms can react
☐ to make them heavier
7. Which particle has a relative charge of 0 and a relative mass of 1?
☐ the neutron
☐ the proton
☐ the electron
☐ the nucleus
8. Across a period, the atomic radius decreases because:
☐ the nuclear charge rises while shielding stays about the same, pulling the outer shell in
☐ a new shell is added each time
☐ shielding increases sharply

- ☐ the atom loses electrons

9. Isotopes of an element have the same number of protons but different numbers of _____.

10. How many electrons can a p sub-shell hold?

- ☐ 6 (three orbitals of 2)
☐ 2
☐ 10
☐ 8

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1. **True**

Electrons carry -1 ; protons $+1$; neutrons 0 .

2. **True**

Losing the outer-shell electrons reduces shielding and shrinks the ion.

3. **the same number of protons but a different number of neutrons**

Isotopes share the proton number Z but differ in neutron number, so they have different nucleon numbers A .

4. **3s1**

Sodium has one electron in the 3s sub-shell.

5. **True**

This is why 'electrons in boxes' show at most two arrows, pointing opposite ways.

6. **so there are no forces between the particles**

Using gaseous atoms means there are no interactions between particles, so the value measures only the atom's own attraction.

7. **the neutron**

A neutron is neutral (charge 0) with relative mass 1 ; the proton is $+1$ mass 1 ; the electron is -1 and almost massless.

8. **the nuclear charge rises while shielding stays about the same, pulling the outer shell in**

Electrons go into the same outer shell, so rising nuclear charge with similar shielding pulls them closer.

9. **neutrons**

Same protons (so same element), different mass.

10. **6 (three orbitals of 2)**

A p sub-shell has 3 orbitals, each holding 2 electrons, so 6 in total ($s = 2$, $d = 10$).