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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Answers · 答案

A-Level Chemistry

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).