

Previous T1 Writing Questions

Question	1	Question
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a. Complete the sentences.

Choose answers from the box.

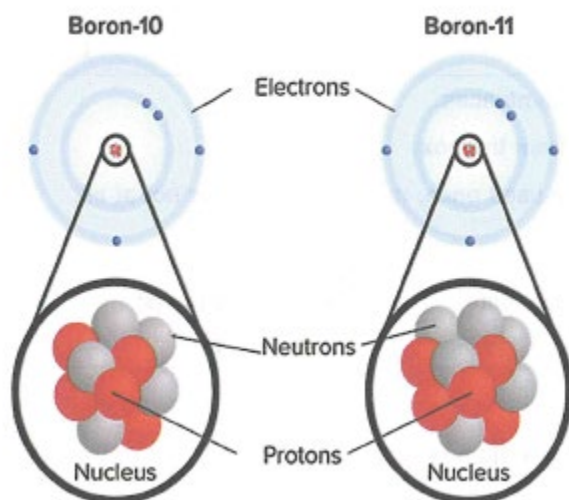
Each word may be used once, more than once, or not at all.

[4 points]

electron(s)	ion(s)	neutron(s)
nucleus		proton(s)

- The center of the atom is the **nucleus**.
- The two types of subatomic particles in the center of the atom are the proton and the **neutron**.
- The atomic number of an atom is the number of **protons**.
- The two types of subatomic particles with the same mass are the **protons** and the **electrons**.

b. In a sample of an element Boron, there are two isotopes.



Explain why these atoms are isotopes.

[3 points]

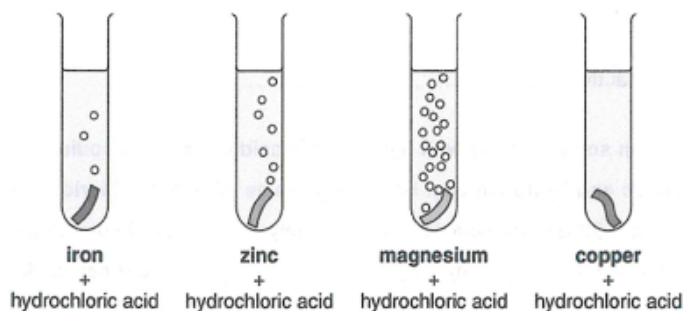
They have the same number of protons but different number of neutrons.

c. What is the definition of the average atomic mass of an element?

[3 points]

The weighted average of all the isotopes of an element

Rahma puts pieces of four different metals in four test tubes.
She poured 12 cm³ of hydrochloric acid onto each metal.



a) Look at the diagrams above.

(i) How does this show that a metal reacts with acid?

[2 points]

The formation of bubbles.

b) When sodium reacts with hydrochloric acid it produces sodium chloride and hydrogen gas. How many grams of sodium chloride are formed if 30 g of sodium reacts completely with 55 g of hydrochloric acid to release 40 g of hydrogen? (Show your calculation.)

[4 points]

$$30 + 55 = 85$$

$$85 - 40 = 45$$

45 g of hydrogen were formed

(ii) On the lines below, list the four metals in the order of how strongly they react with the acid.

[2 points]

most reactive magnesium
.....
 zinc
.....
 iron
.....
least reactive copper

c) Choose the name of a metal from the box below to answer each question.

chromium sodium tungsten magnesium

(i) Which metal from the box is used for making a lightbulb filament?

[1 point]

Tungsten

(ii) Which metal from the box is present in chlorophyll that enables plants to absorb light and make food?

[1 point]

Magnesium

Question	3	Question
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The table below shows the melting points and boiling points of four elements.

element	melting point(°C)	boiling point(°C)
mercury	-39	357
gold	1063	2800
zinc	420	910
cobalt	1495	2925

When answering the questions below, you may give the name of an element more than once. [4 points]

a) Which element in the table is:

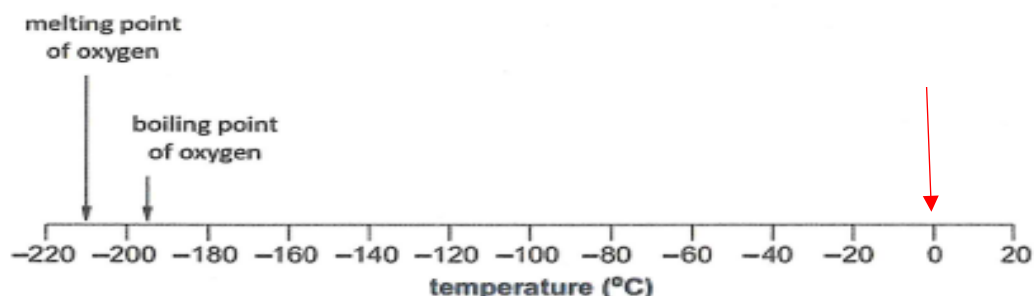
(i) a liquid at 0°C? mercury

(ii) a solid at 1400°C? cobalt

(iii) a gas at 600°C? mercury

(iv) a liquid over the biggest temperature range?
gold

b) The melting point and boiling point of oxygen are marked on the scale below.



(i) Draw an arrow on the scale above to show the temperature at which water freezes. [1 point]

(ii) When water is a liquid, what is the physical state of oxygen? [1 point]

Tick the correct box.

solid ☐ liquid ☐ gas ☒

(iii) What is the physical state of oxygen at -200°C ? [1 point]

Tick the correct box.

solid ☐ liquid ☒ gas ☐

c) State the basic assumptions of the kinetic theory of gases.

[2 points]

- Assumptions of kinetic theory:
 - All matter is composed of tiny particles (atoms, molecules, and ions).
 - These particles are in constant, random motion.
 - The particles collide with each other and with the walls of any container in which they are held.
 - Particles lose some energy when they bump into other particles. The amount of energy the particles lose is very small and can be ignored.

d. What is the difference between the heat of fusion and the heat of vaporization? [1 point]

heat of fusion is the energy to change a substance from **solid to liquid** (melting), while **heat of vaporization** is the energy to change it from **liquid to gas** (boiling or evaporation)