Atomic Structure

Total Marks : 17

Q1.

Figure 4 shows the atomic number and mass number of two isotopes of argon.

isotope	atomic number	mass number
argon-38	18	38
argon-40	18	40

Figure 4

Describe the structure of an atom of argon-38 and of an atom of argon-40.

(3)

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(Total for question = 3 marks)

Q2.

An atom of aluminium has an atomic mass of 27.

Aluminium has an atomic number of 13.

State the number of electrons, neutrons and protons in this atom.

(3)

number of electrons = ...

number of neutrons = ...

number of protons = ...

(Total for question = 3 marks)

Q3.

A sample of silicon contains isotopes.

(i) State, in terms of subatomic particles, how atoms of these isotopes are the same.

(1)

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(ii) This sample of silicon contains three isotopes.

92% of the atoms are silicon-28
5% of the atoms are silicon-29
3% of the atoms are silicon-30

Calculate the relative atomic mass of silicon in this sample.

(2)

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relative atomic mass = ...

(Total for question = 3 marks)

Q4.

Figure 1 shows the dot and cross diagram for a molecule of ammonia.

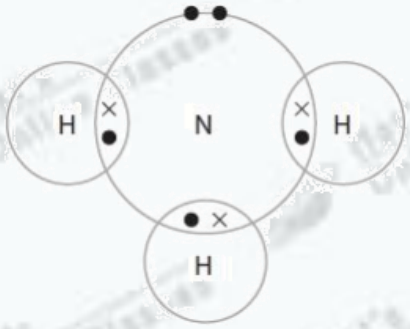

Figure 1

(i) What do the dots and crosses represent in the diagram?

(1)

- ☒ **A** electrons
- ☒ **B** neutrons
- ☒ **C** protons
- ☒ **D** nuclei

(ii) Give the formula for the molecule of ammonia.

(1)

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(Total for question = 2 marks)

Q5.

* A sample of magnesium contains

79% of magnesium-24 atoms
10% of magnesium-25 atoms
11% of magnesium-26 atoms.

In most calculations the relative atomic mass of magnesium used is 24.

Use this information to explain why, in this sample, magnesium has a relative atomic mass of 24.3.

(6)

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(Total for question = 6 marks)