Combined science - Physics

Key stage 4 - Atomic Structure

Atomic Structure - Review lesson 1

Mr van Hoek

Draw and label a diagram of the atom

You should include:

- **The names of the three particles**
- **The two different terms that the ‘rings’ can be called**
- **The name of the central bit**
- **Any dimensions**

Complete the table with the properties of the sub-atomic particles

Particle	Relative Mass	Relative charge	Location
Proton			
Neutron			
Electron			

Exam Question

Look at the diagram of an atom of boron.

What is the name of particle A? _____[1]

The relative electric charge of each electron is -1.

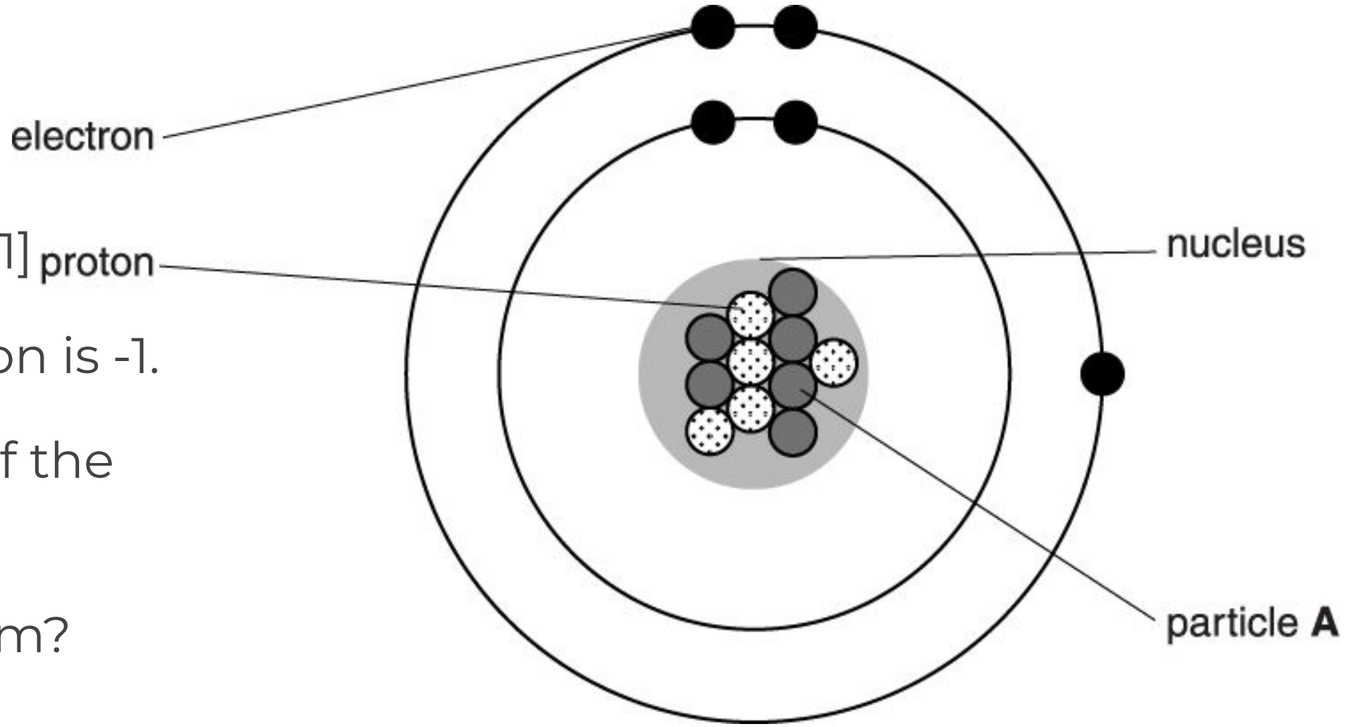
What is the total relative electric charge of the nucleus of a boron atom?_____[1]

What is the electric charge of a boron atom?

Choose from

negative neutral positive

answer _____ [1]



OCR, June 2014, B722/01

Exam Question

This question is about atomic structure.

An atom of chlorine can be represented as:

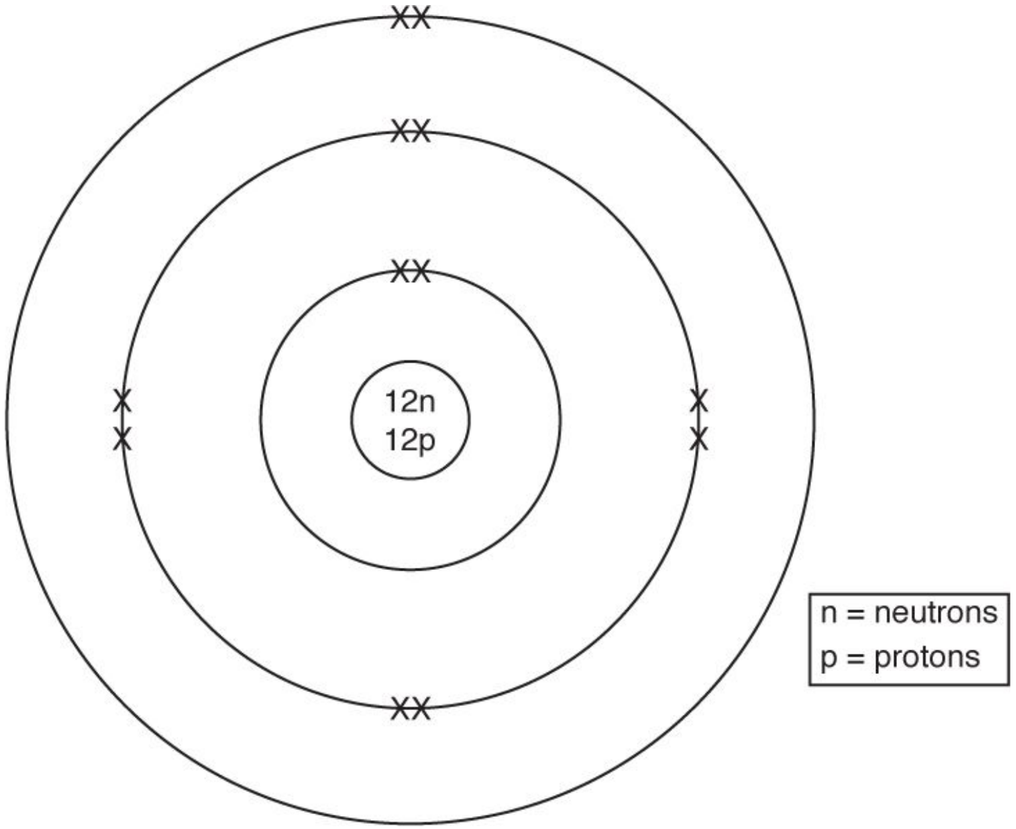
Complete the following sentence.

This atom of chlorine contains ..... protons, 17 electrons and ..... neutrons.

OCR, June 2013, B722/02

Exam Question

Look at the diagram of the structure of an atom of an element.



The element has several isotopes.
This atom is one of these isotopes.

What is meant by the word isotopes?

OCR, June 2017, B722/02

Complete the table for the key developments in the History of the Atom

Discovery	By	Model
	John Dalton	
		Plum pudding: positive cake with.....
Nucleus		
Neutron		
	Niels Bohr	

Exam Question

Many scientists have been involved in the development of the Periodic Table and the structure of the atom.

The early theories of atomic structure were replaced by newer ideas.

Explain why. [1 mark]

OCR, June 2016, B722/01

Exam Question

In 1808 John Dalton published his theory about matter.

Which of Dalton's ideas is now known to be incorrect?

A A chemical reaction is a rearrangement of atoms.

B All matter consists of atoms.

C Atoms cannot be subdivided.

D When elements react, their atoms combine in simple, whole-number ratios.

OCR, June 2018, J250/03

Exam Question

Many scientists have worked to discover the structure of the atom.

Dalton believed that elements were made of atoms.

He also believed that atoms could not be split.

JJ Thomson did some experiments.

What did JJ Thomson discover that showed that not all of Dalton's ideas were correct?

Choose from:

electron shells **electrons** **nucleus** **neutrons** **protons**

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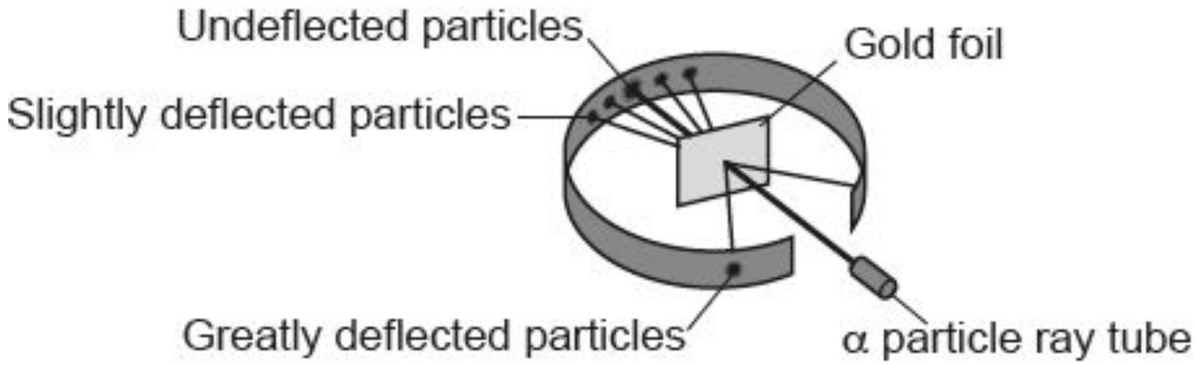
Exam Question

The atomic model has changed over time.

J.J.Thomson suggested the ‘plum pudding’ model of atoms. Rutherford, working with Geiger and Marsden, tested J.J.Thomson’s ‘plum pudding’ model.



Look at the diagram of the experiment they did.

What conclusions did Rutherford, Geiger and Marsden draw from the experiment?

Explain how their results supported their conclusions.

OCR, June 2018, J250/03

Complete the table with the properties of the nuclear radiations

Nuclear Radiation	Symbol	What is it?	Relative charge	Ionising power	Range in air	Penetration
Alpha			+2		5 cm	
Beta		High speed electron				
Gamma				Low		Blocked by thick .....
Neutron	**n**			---	---	---

Join up the words with their definitions

Unstable	The process of radiation being released by a nucleus.
Radioactive decay	The unit of activity
Nuclear radiation	How quickly a radioactive sample decays
Activity	The ability for a nucleus to decay
Becquerel	A device to measure the count rate of a radioactive source
Geiger-Muller tube	The number of radioactive decays per second
Count rate	Unwanted hazardous materials containing radioactive atoms
Ionising power	The particles released when an unstable nucleus decays
Half life	How well it knocks off electrons and damages cells
Contamination	The time it takes half of a group of radioactive nuclei to decay

Exam Question

An engineer tests underground pipes to see if they have a fault.

She uses a gamma radioactive tracer to find the faults.

Why are alpha and beta tracers not used to check pipes?

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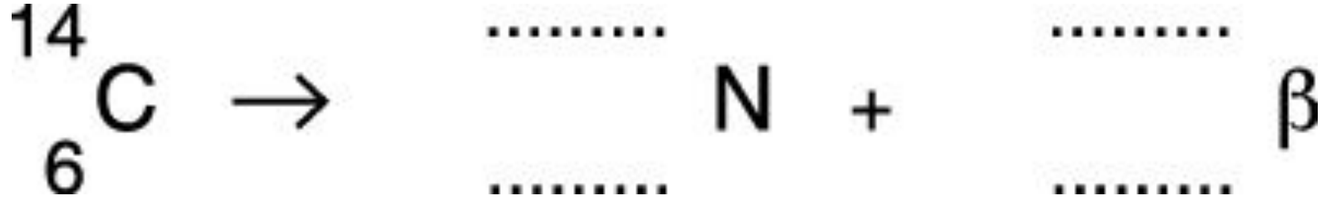
Exam Question

Carbon-14 is a radioactive isotope which decays by emitting a beta particle.

An isotope of nitrogen is formed, as shown in the nuclear equation below.



Complete the nuclear equation and describe in detail what happens to the particles in the nucleus of the carbon atom. Include ideas about mass number, atomic number and a description of the emitted β particle in your answer.

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