

Checkups and follow-ups

CHAPTER 1

ST
Questions 1-9, 13-18, 28-31, A and C

Atoms and elements

Checkup

1 WHAT IS AN ATOM? (pp. 6-17)

1. Here is a representation of a molecule of water (H₂O). Does it respect the principles behind Dalton's atomic model? Explain your answer.



No, they are all the same size.
 Different elements (H & O) should appear different.

2. What conclusion did Thomson draw from each of the following observations?

a) The cathode rays cause a small propeller inside the tube to turn.

Physical particles exist in the atom

b) The rays are identical regardless of the metal used to make the cathode.

All atoms contain similar particles

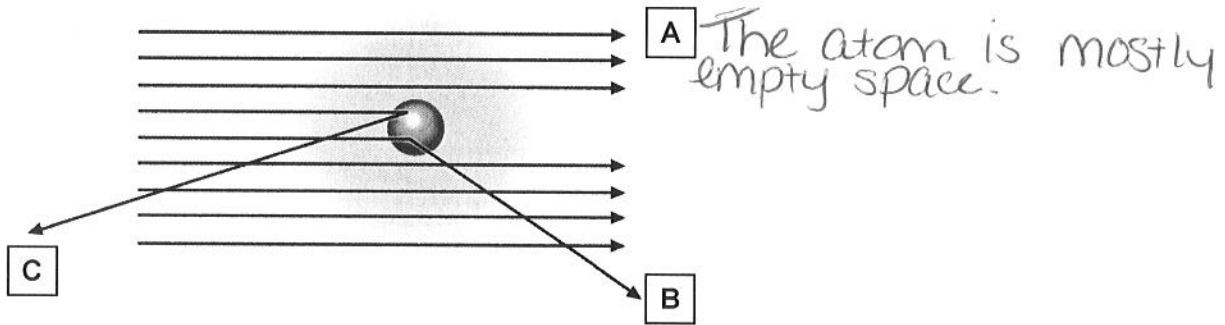
c) The cathode rays are attracted to the positive pole of an electrical field.

These particles are negative

3. What type of radiation did Rutherford use for his research on atomic structure?

(alpha), beta, gamma
 mostly.

4. Look at the illustration below. Each letter corresponds to an observation made by Rutherford. Describe each observation and match it with one of Rutherford's conclusions.



B & C : There is a solid nucleus at the center of the atom

5. Which positively charged particle is found in the nucleus?

protons

6. The bright colours of fireworks amaze and delight us. Each colour is the result of the combustion of a specific substance. For example, potassium chloride produces a purple flame, and sodium chloride, an orange-yellow flame. Which theory, proposed by Bohr, explains this phenomenon?

Electrons occupy different energy levels surrounding the nucleus. These are called orbits.

7. Match a characteristic of the Rutherford-Bohr atomic model with each of the following statements.

- a) An atom contains as many protons as electrons.

atoms are neutral

- b) Alpha particles pass easily through gold foil.

atoms are made up mostly of empty space

- c) Alpha particles are strongly repelled by the nucleus.

The nucleus is positively charged ($p^+ + n^0$)

- d) A heated gas emits light waves of a specific length.

Electrons can move from one orbit to another, releasing or absorbing energy.

**not important*

2 THE PERIODIC CLASSIFICATION OF THE ELEMENTS (pp. 17–26)

8. Where are the nonmetals in the periodic table?

Right of the staircase

9. What do elements of the same group have in common?

- Same valence e^-
- Same properties (chemical)

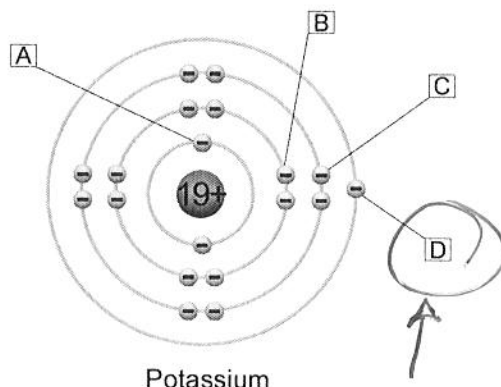
10. Hydrogen is a nonmetal, but it is in the same column as the alkali metals. Explain your answer.

It only has 1 valence e^- placing it in group 1. It is an exception.

11. What are the elements in the second column of the periodic table called? What do they have in common?

Alkali Earth Metals
properties: 2 valence e^- , malleable, reactive,
form many compounds found in rocks.

12. In the atomic model of potassium below, which letter represents a valence electron? Explain your answer.



Potassium

_____ electrons occupying the outermost orbit.

13. What do elements of the same period have in common?

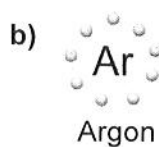
Same # of orbits.

3 REPRESENTING ATOMS (pp. 26–29)

14. Are the atomic representations below correct Lewis structures? If not, explain your answer.

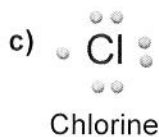
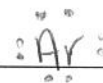


Yes



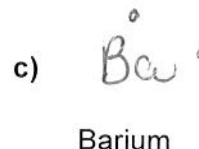
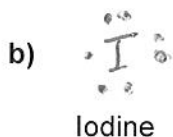
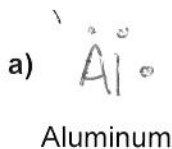
No.

Argon has 8 valence e^-

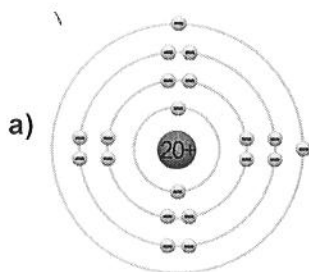


Yes

15. Represent the following atoms in Lewis notation.

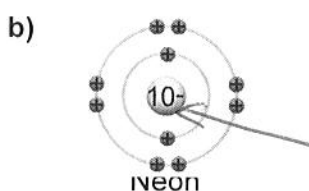


16. Are the atomic representations below correct according to the Rutherford-Bohr model? If not, explain your answer.



Calcium

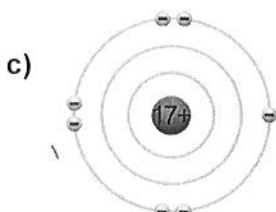
Yes _____



Neon

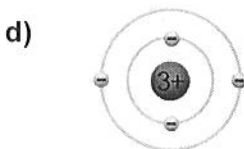
No. _____

 10p⁺ _____



Chlorine

No. _____
 Missing all other non-valence
 electrons. _____



Lithium

No, lithium only has 3e⁻ &
 1e⁻ in the valence shell. _____
