

## Atomic Model Worksheet

1. Which of the following statements correctly describes the fluorine atom using the Rutherford–Bohr model?

- A) An atom with 9 protons in the nucleus, with 2 electrons on the first shell and 7 on the second shell.
- B) An atom with 9 protons in the nucleus, with 8 electrons on the first shell and 11 electrons on the second shell and 9 electrons on the third shell.
- C) An atom with 19 protons in the nucleus, with 8 electrons on the first shell and 11 on the second shell.
- D) An atom with 2 protons, 1 electron on the first shell and 1 electron on the second shell

2. What do protons and electrons have in common?

- A) They both carry an electrical charge.
- B) Neither of them carry an electrical charge.
- C) They are both situated outside the nucleus of an atom.
- D) They are both situated inside the nucleus of an atom.

3. Rutherford modified the atomic model after doing experiments where the alpha particles were dispersed by a sheet of gold foil. Considering the statements below, which statements are based on Rutherford's experiments only?

- 1- The number of protons is equal to the number of electrons
- 2- Protons are concentrated in a small positive space at the center of the atom
- 3- Atoms consist of mostly empty space
- 4- Electrons are contained in a positive sphere made up of protons
- 5- Electrons move about in specific energy levels

- A) 1 and 2
- B) 1 and 4
- C) 2 and 3
- D) 2, 3 and 5

4. Which of the following are positively charged?

- 1. The proton
  - 2. The electron
  - 3. The atom
  - 4. The nucleus
- A) 1 and 2
  - B) 2 and 3
  - C) 3 and 4
  - D) 1 and 4

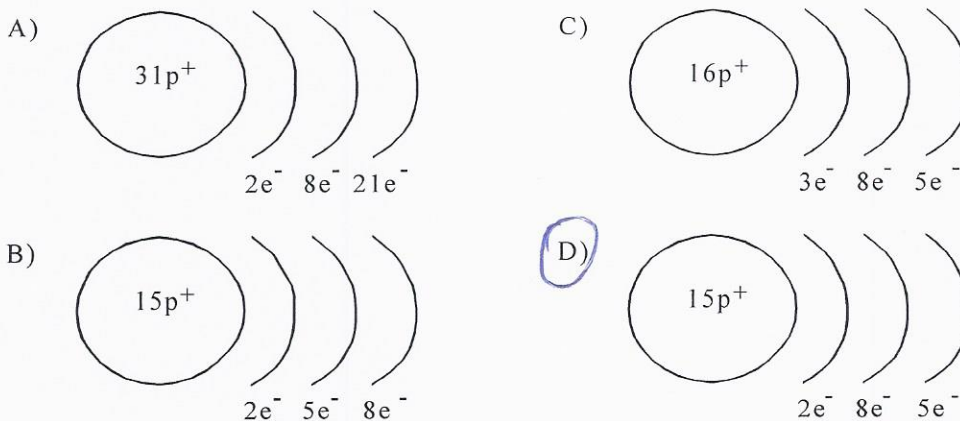
5. Which of the following statements correctly describe a difference between electrons and protons?

- A) Protons are found outside the nucleus; electrons are found inside the nucleus.
- B) Protons are positively charged; electrons are negatively charged.
- C) Protons have no electrical charge; electrons have a positive charge.
- D) Protons are found inside the nucleus; electrons are found inside the neutrons.

6. The concepts listed in the box below relate to the structure of an atom. Draw arrows to represent the correct match between each particle, its location and its electrical charge.

Proton	15	1) inside the nucleus
		2) outside the nucleus
		3) negative charge
		4) neutral
Electron	23	5) positive charge

7. Which of the following diagrams best represents the Rutherford-Bohr model of the phosphorus atom, P?



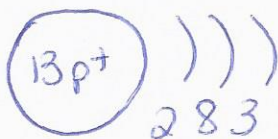
8. Determine if each statement is true or false.

- a- Electrons are found evenly spread in the atom.
- b- Electrons are found in the nucleus.
- c- The third orbit can hold a maximum of 8 electrons.
- d- Oxygen (O) has nine electrons.
- e- Magnesium (Mg) has 12 protons.
- f- Rutherford believed the atom was very big and almost empty.
- g- Protons are found on orbits in specific numbers.

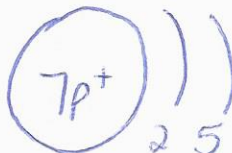
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9. Make a Bohr Rutherford model for the following elements:

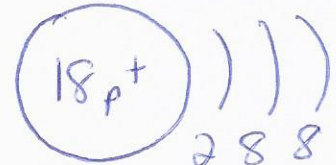
Aluminum (Al)



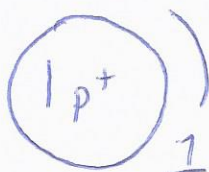
Nitrogen (N)



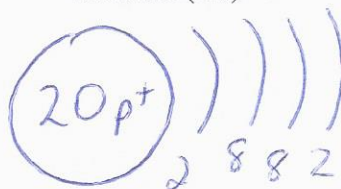
Argon (Ar)



Hydrogen (H)



Calcium (Ca)



Sodium (Na)

